Eureka-Arcata Route 101
Corridor Improvement Project

Humboldt County, California
District 1 – HUM – 101 PM 79.9 / 86.3
EA / EFIS
01-36600 / 0100000127
01-0E000 / 0113000091
01-0C970 / 0113000094
01-0C930 / 0113000078
01-0F220 / 0115000092
State Clearinghouse Number: 200109035

Final Environmental Impact Report/Statement

Volume II of IV
Appendices
December 2016

Prepared by the U.S. Department of Transportation
Federal Highway Administration (FHWA) and the
State of California Department of Transportation (Caltrans)
For the Humboldt County Association of Governments (HCAOG)

❖

Appendix A Project Plan Sheets and Typicals

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	HUM	101	PM 79.9/86.3		

FOR DESIGN STUDY ONLY

REGISTERED PROFESSIONAL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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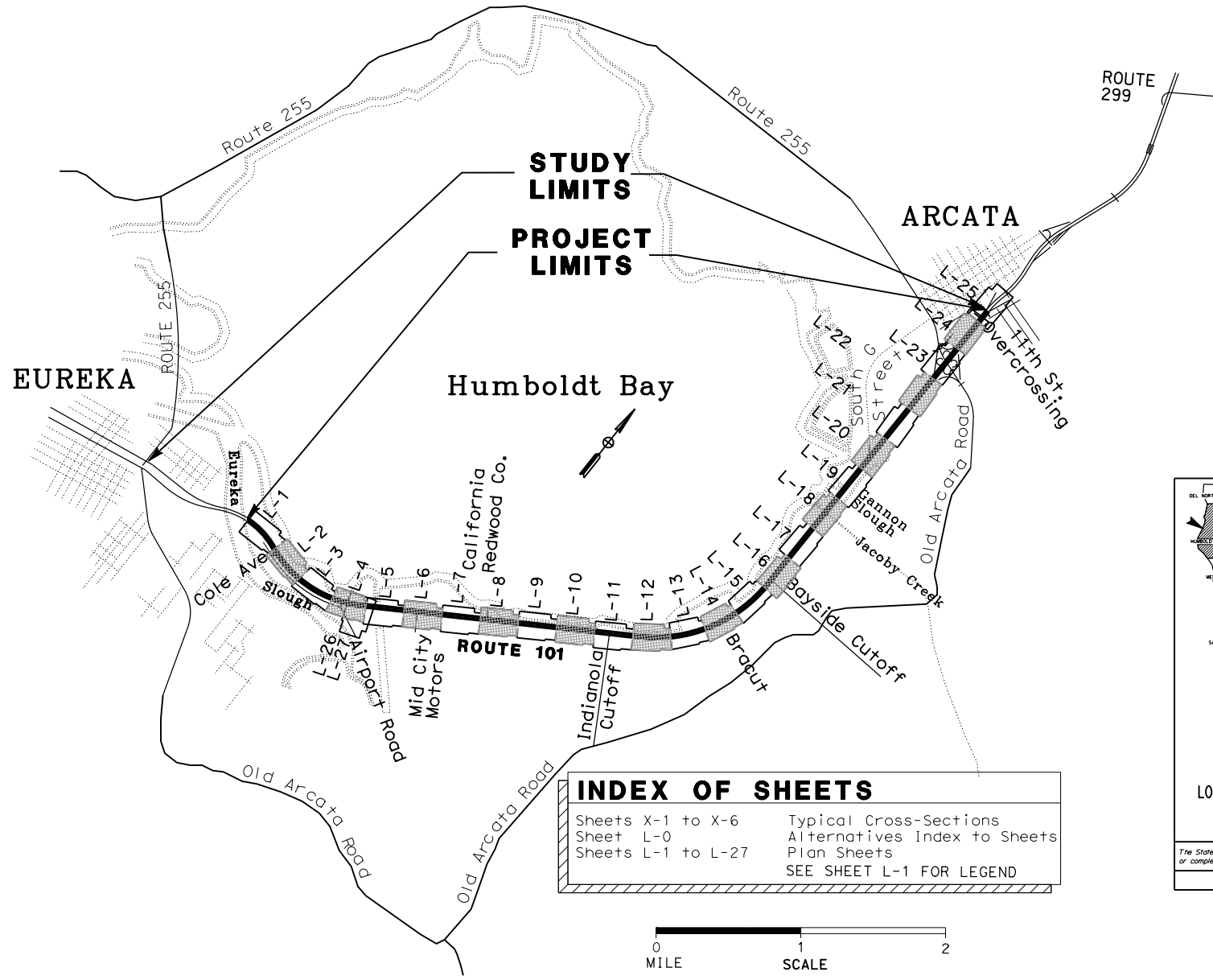

INDEX OF SHEETS

Sheets X-1 to X-6	Typical Cross-Sections
Sheet L-0	Alternatives Index to Sheets
Sheets L-1 to L-27	Plan Sheets
	SEE SHEET L-1 FOR LEGEND

0 1 2
MILE SCALE

LOCATION MAP

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LOCATION PLAN/ INDEX OF SHEETS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

PROJECT ENGINEER: Todd Lark

CALCULATED/DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

LAST REVISION 1-31-06

DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 09:56

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s119316
DGN FILE => project-limits.dgn

CU 00000

EA 366000

Layout Sheet Number	Alternative 1	Alternative 1A	Alternative 2	Alternative 3	Alternative 3A	Modified Alternative 3A
L-1	X	X	X	X	X	X
L-2	X	X	X		X	X
L-2(ii)				X		
L-3	X	X	X		X	X
L-3(ii)				X		
L-4		X			X	
L-4(ii)	X		X			
L-4(iii)				X		
L-4(iv)						X
L-5	X	X	X		X	X
L-5(ii)				X		
L-6	X	X	X		X	
L-6(i)				X		X
L-7	X		X	X	X	X
L-7(i)		X				
L-8	X		X	X	X	X
L-8(i)		X				
L-9	X	X	X	X	X	X
L-9(i)		X				
L-10					X	X
L-10 (i)		X				
L-10 (ii)			X	X		
L-10 (iii)	X					
L-11					X	X
L-11 (i)		X				
L-11 (ii)			X	X		
L-11 (iii)	X					
L-12					X	X
L-12 (ii)			X	X		
L-12 (iii)	X	X				
L-13	X		X	X	X	X
L-13 (i)		X				
L-14	X		X	X	X	X
L-14 (i)		X				
L-15	X	X	X	X	X	X
L-16	X	X	X	X	X	X
L-17	X	X	X	X	X	X
L-18	X	X	X	X	X	X
L-19	X	X	X	X	X	X
L-20	X	X	X	X	X	X
L-21	X	X	X	X	X	X
L-22	X	X	X	X	X	X
L-23	X	X	X	X	X	X
L-24	X	X	X	X	X	X
L-25	X	X	X	X	X	X
L-26	X	X	X	X	X	X
L-27				X		

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

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Index of Layout Sheets Alternatives 1, 1A, 2, 3, 3A & Modified 3A

L-0

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY

CALCULATED-DESIGNED BY: TODD LARK

CHECKED BY

REVISED BY

DATE REVISED

LAST REVISION 08-11-08

DATE PLOTTED => 08-OCT-2012

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BORDER LAST REVISED 4/11/2008

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USERNAME => s119316

DGN FILE => 136330-lim-index.dgn

CU 03232

EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

REGISTERED CIVIL ENGINEER DATE

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PLANS APPROVAL DATE

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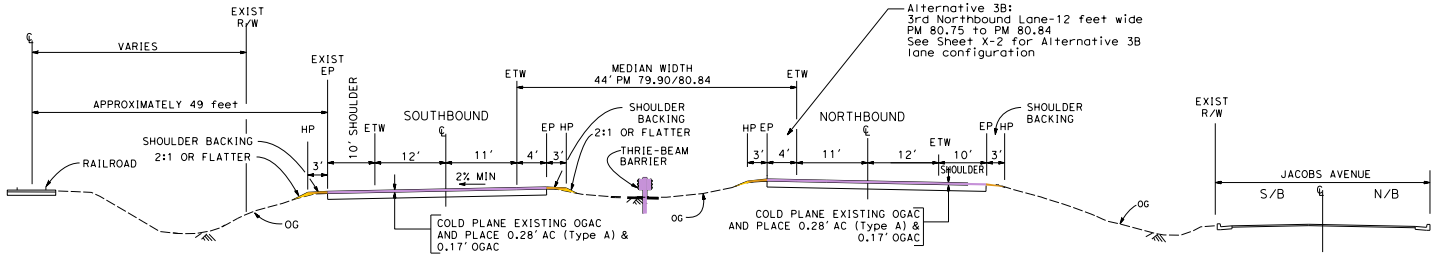
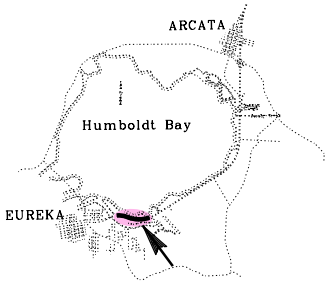
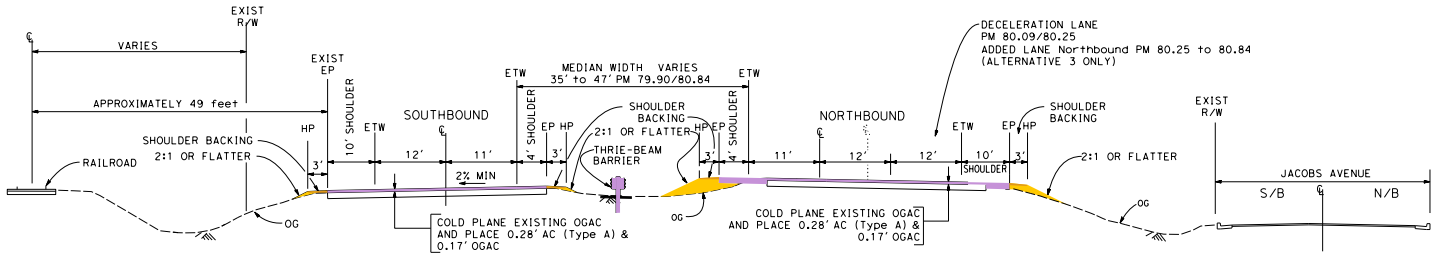


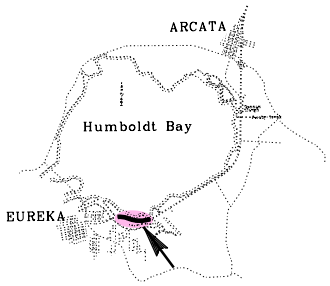


ROUTE 101

PM 79.9/80.6

EUREKA SLOUGH BRIDGE TO AIRPORT ROAD (Alternatives 1, 1A, 2, 3A & Modified 3A)





ROUTE 101

PM 79.9/80.6

EUREKA SLOUGH BRIDGE TO AIRPORT ROAD (Alternative 3)

Abbreviations

AC	Asphalt Concrete
EP	Edge of Paving
ES	Edge of Shoulder
ETW	Edge of Traveled Way
FG	Finished Grade
HP	Hinge Point (Break in Grade between slopes)
MBGR	Metal Beam Guard Railing
OG	Original Ground
OGAC	Open Graded Asphalt Concrete
R/W	Right of Way (Highway)
℄	Center Line (Lane Line)

Legend

Proposed new fill

Proposed new element or structure

TYPICAL CROSS SECTIONS X-1

No scale

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans DESIGN

FUNCTIONAL SUPERVISOR L.R. ASHLEY

CALCULATED-DESIGNED BY TODD LARK

CHECKED BY

REVISED BY

DATE REVISED

LAST REVISION 08-11-08

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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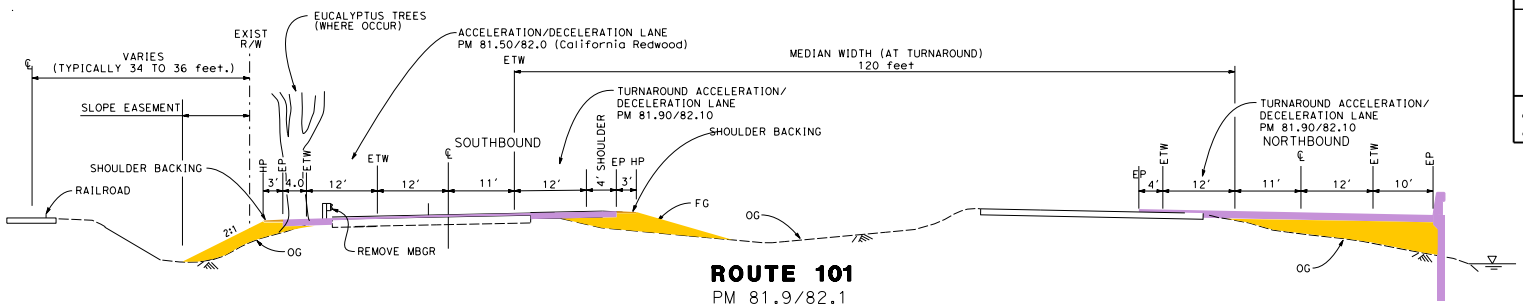
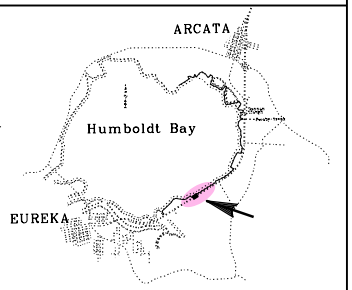
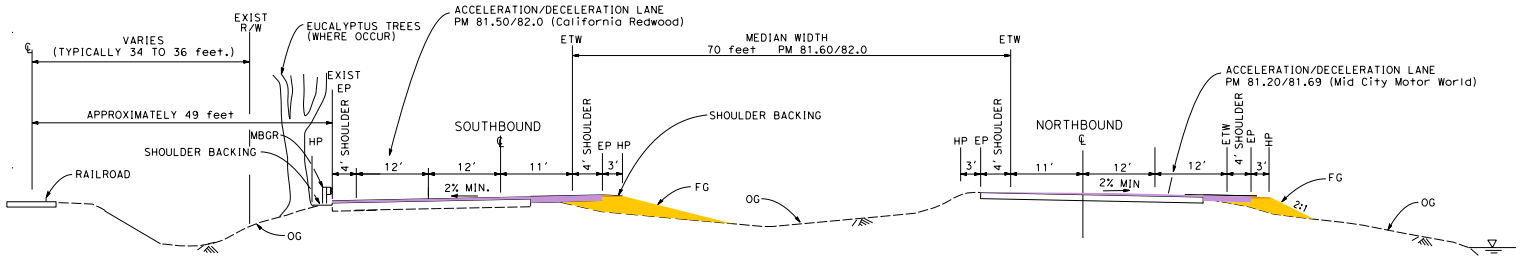


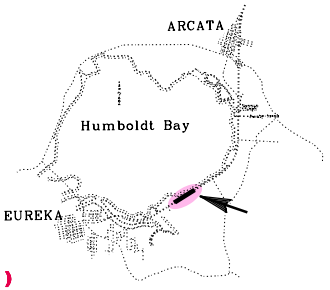


ROUTE 101

PM 81.9/82.1

TURNAROUND (Alternative 1A)

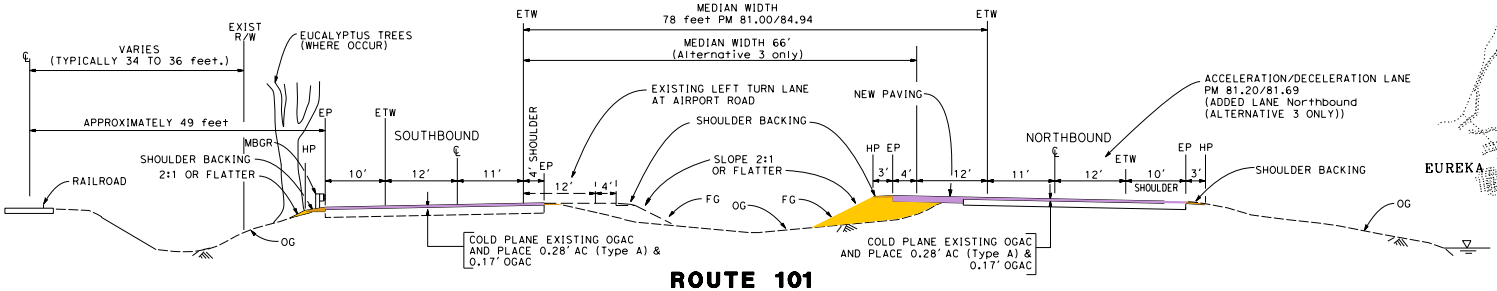


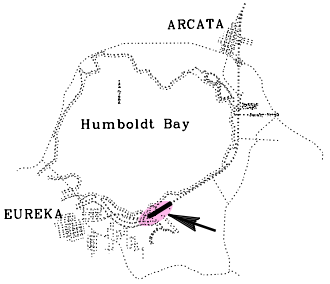


ROUTE 101

PM 81.2/82.0

NEAR CALIFORNIA REDWOOD (Alternatives 1, 2, 3, 3A & Modified 3A)





ROUTE 101

PM 80.6/81.5

AIRPORT ROAD TO MID-CITY (Alternatives 1, 2, 3, 3A & Modified 3A)

TYPICAL CROSS SECTIONS X-2

No scale

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CALCULATED-DESIGNED BY: TODD LARK

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REVISED BY

DATE REVISED

LAST REVISION 08-11-08

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TIME PLOTTED => 09:56

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USERNAME => s119316

DGN FILE => x-section.dgn

CU 03232

EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

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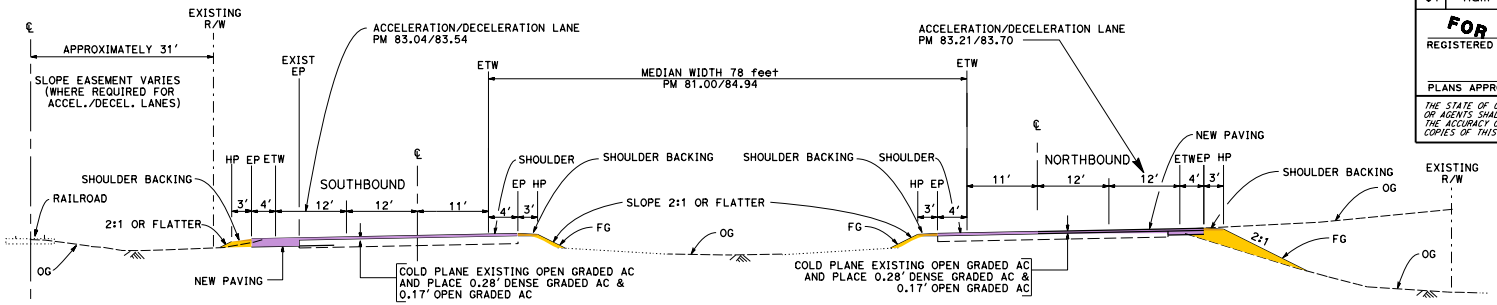
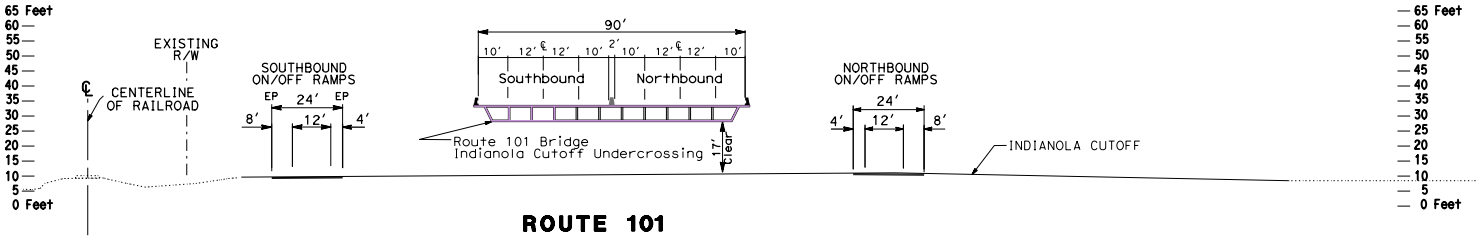
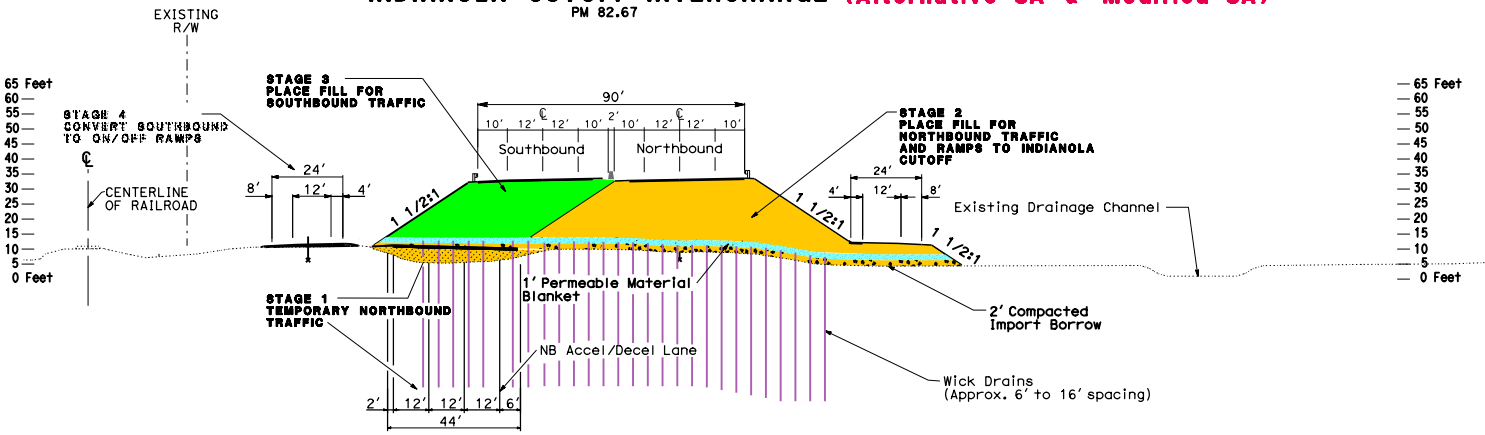


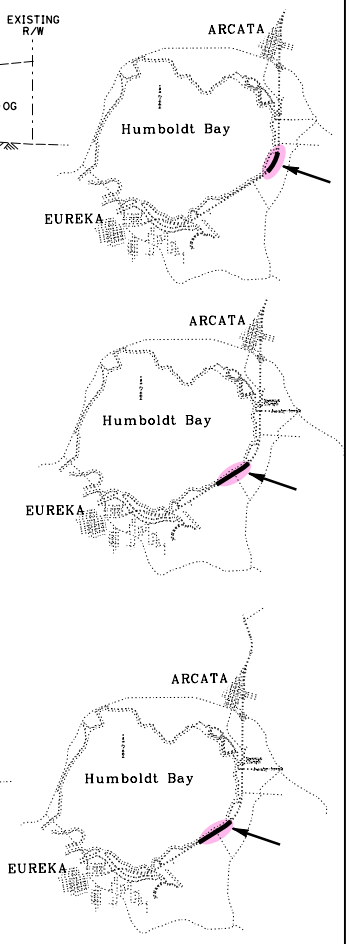
ROUTE 101
PM 83.3/83.7
BRACUT (Alternatives 1, 2, 3, 3A & Modified 3A)



ROUTE 101
INDIANOLA CUTOFF INTERCHANGE (Alternative 3A & Modified 3A)
PM 82.67



ROUTE 101
INDIANOLA CUTOFF INTERCHANGE (Alternative 3A & Modified 3A)
PM 82.2/83.3



TYPICAL CROSS SECTIONS
X-3

No scale

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY

CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
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DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 09:56

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USERNAME => s119316
DGN FILE => x-section.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

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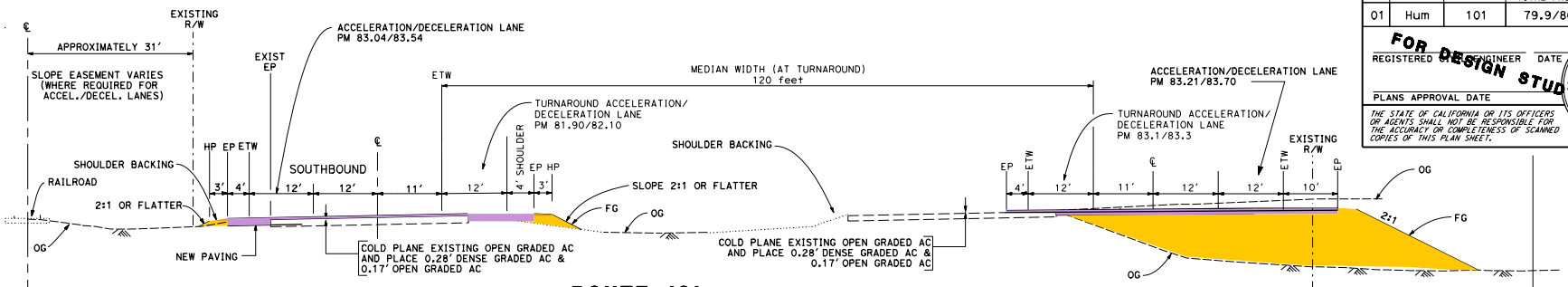
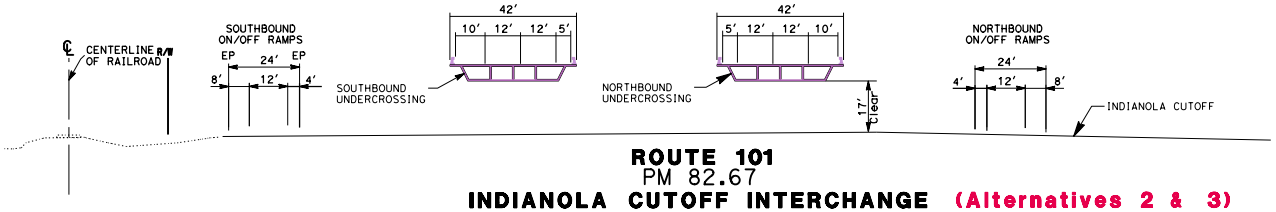
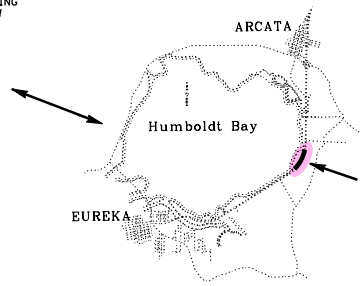
REGISTERED PROFESSIONAL ENGINEER No. CIVIL STATE OF CALIFORNIA

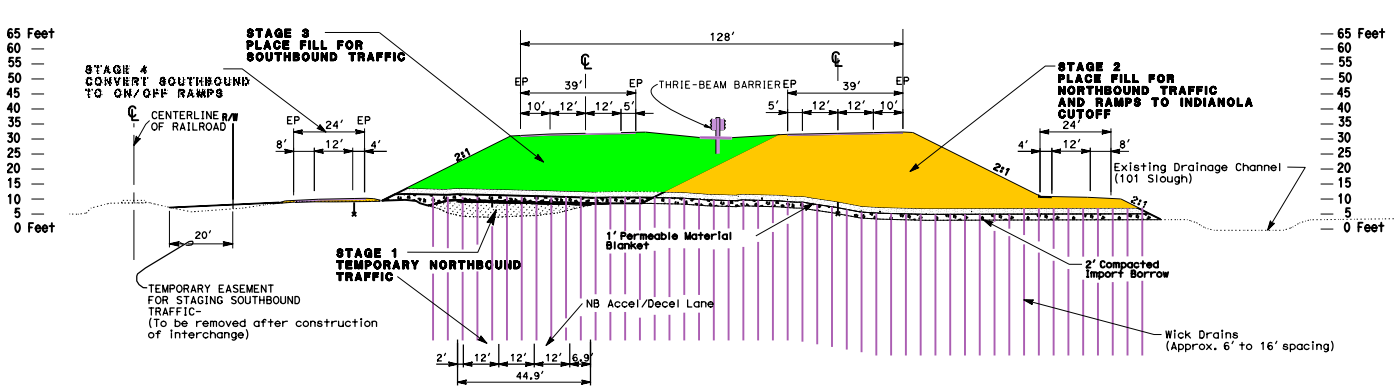


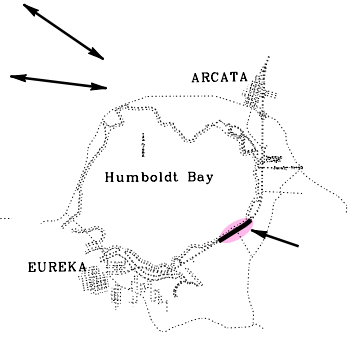
ROUTE 101
PM 83.3/83.7
BRACUT (Alternative 1A - Turnaround)





ROUTE 101
PM 82.67
INDIANOLA CUTOFF INTERCHANGE (Alternatives 2 & 3)





ROUTE 101
PM 82.4/82.9
INDIANOLA CUTOFF INTERCHANGE (Alternatives 2 & 3)

TYPICAL CROSS SECTIONS
X-4

No scale

REVISED BY	DATE REVISED	TODD LARK	CALCULATED-DESIGNED BY	CHECKED BY	FUNCTIONAL SUPERVISOR	L.R. ASHLEY

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Caltrans DESIGN

LAST REVISION 08-11-08 | DATE PLOTTED => 08-OCT-2012 | TIME PLOTTED => 09:56

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

REGISTERED CIVIL ENGINEER DATE

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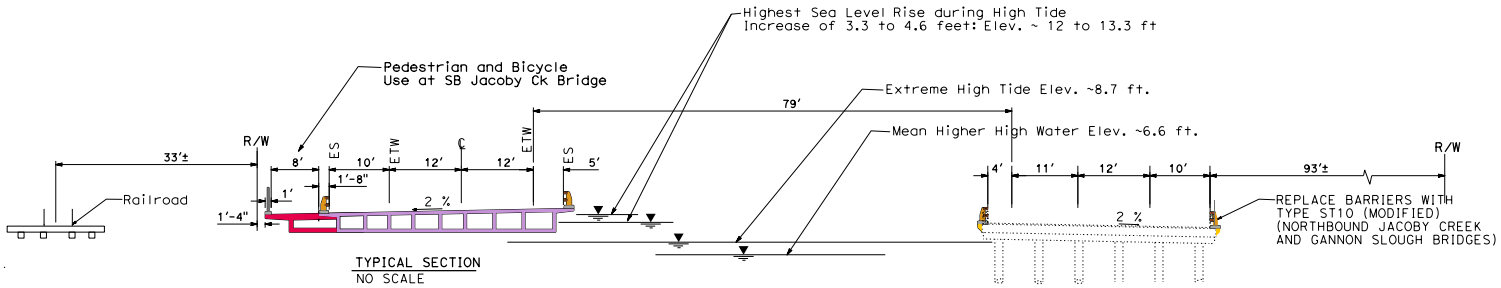

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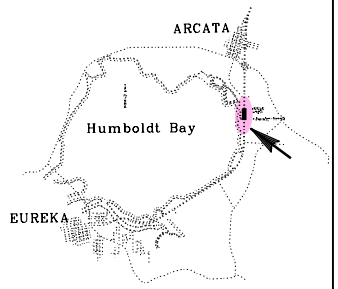
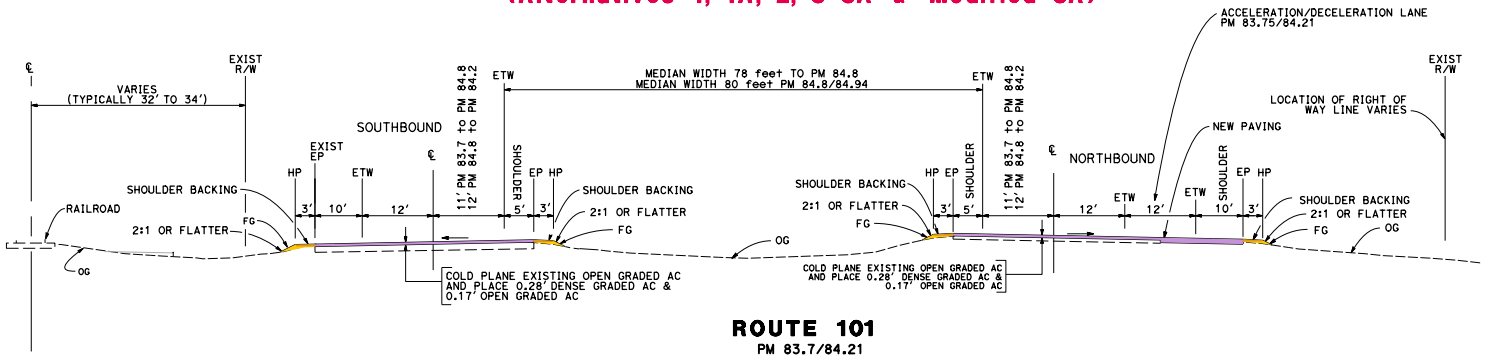
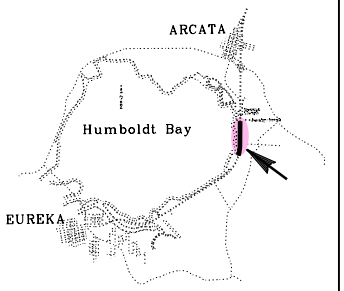


ROUTE 101
PM 84.5
Jacoby Creek Bridges
(Alternatives 1, 1A, 2, 3 3A & Modified 3A)



ROUTE 101
PM 83.7/84.21
BRACUT TO SOUTH "G" STREET
(Alternatives 1, 1A, 2, 3 3A & Modified 3A)



TYPICAL CROSS SECTIONS
X-5

No scale

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY	CHECKED BY
TODD LARK	

FUNCTIONAL SUPERVISOR: L.R. ASHLEY

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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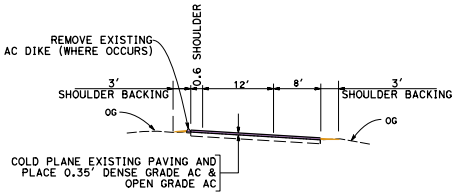
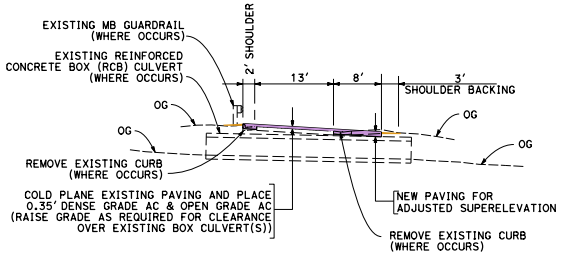


ROUTE 101/ROUTE 255

TYPICAL SECTION - RAMPS

(Alternatives 1, 1A, 2, 3 3A & Modified 3A)

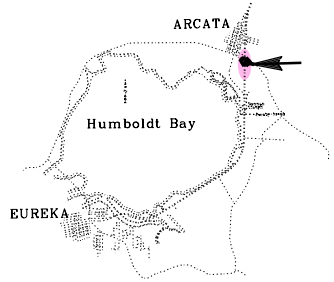


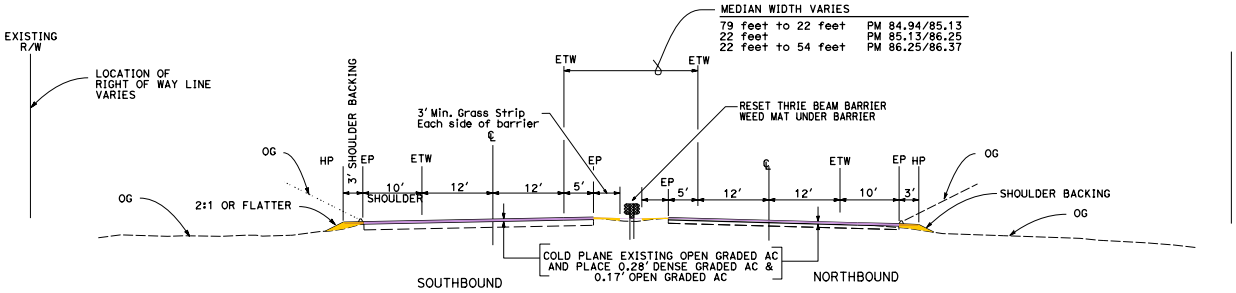
ROUTE 101/ROUTE 255

TYPICAL SECTION - LOOP RAMPS

(REQUIRES MINOR WIDENING AT ROUTE 255/ ROUTE 101 INTERCHANGE

(Alternatives 1, 1A, 2, 3 3A & Modified 3A)



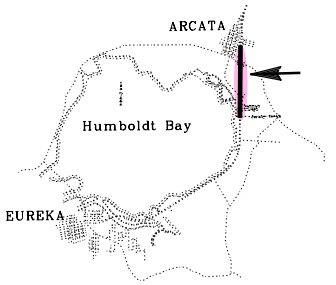


ROUTE 101

PM 85.02/86.33

MEDIAN BARRIER FROM SOUTH G STREET TO 11TH STREET OVERCROSSING

(Alternatives 1, 1A, 2, 3 3A & Modified 3A)



TYPICAL CROSS SECTIONS X-6

No scale

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans DESIGN

FUNCTIONAL SUPERVISOR L.R. ASHLEY

CALCULATED-DESIGNED BY TODD LARK

CHECKED BY

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DATE REVISED

LAST REVISION 08-11-08

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USERNAME => s119316

DGN FILE => x-section.dgn

CU 03232

EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

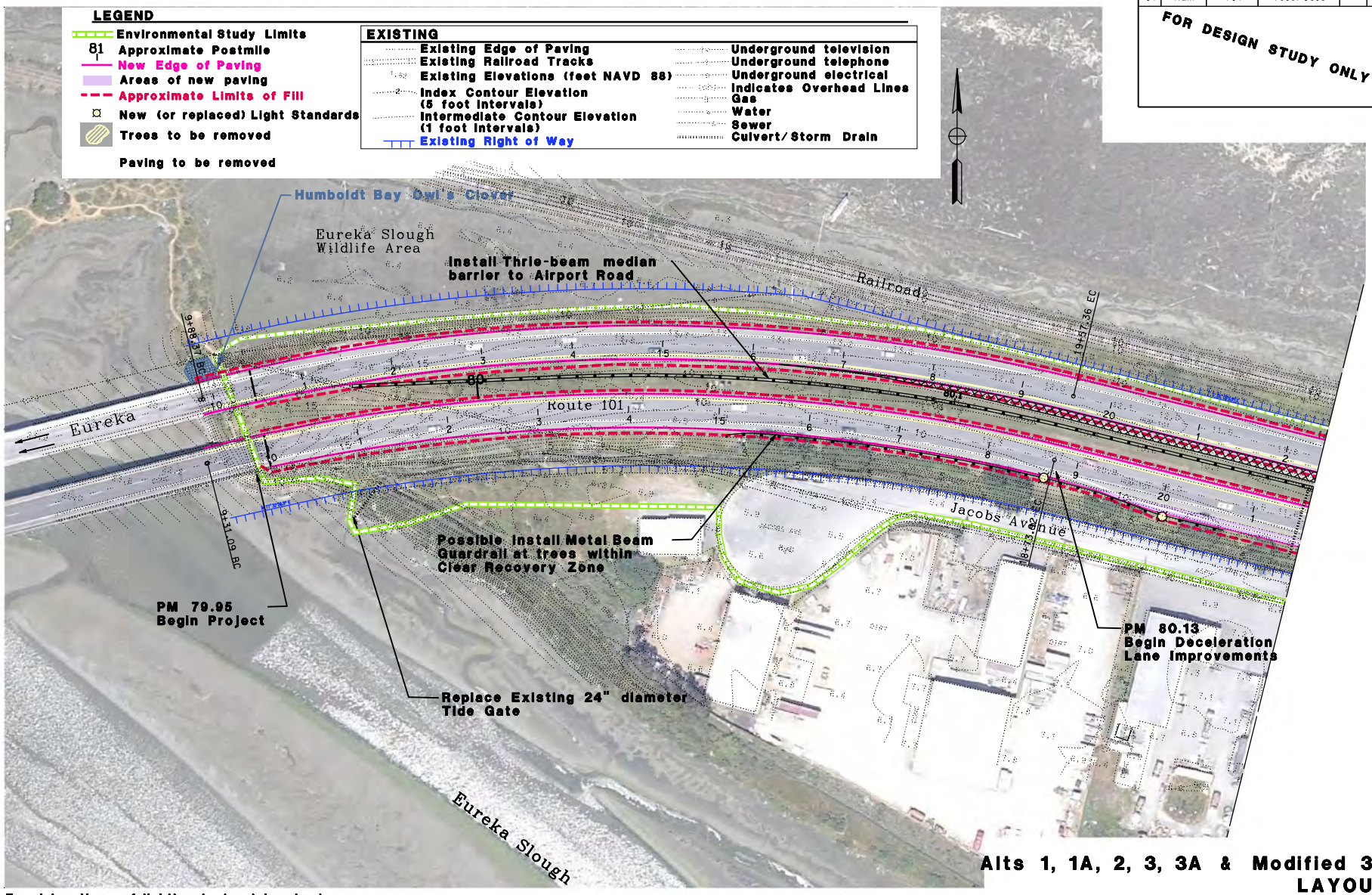
FOR DESIGN STUDY ONLY

LEGEND

- Environmental Study Limits
- 81 Approximate Postmile
- New Edge of Paving
- Areas of new paving
- Approximate Limits of Fill
- New (or replaced) Light Standards
- Trees to be removed
- Paving to be removed

EXISTING

- Existing Edge of Paving
- Existing Railroad Tracks
- Existing Elevations (feet NAVD 88)
- Index Contour Elevation (5 foot intervals)
- Intermediate Contour Elevation (1 foot intervals)
- Existing Right of Way
- Underground television
- Underground telephone
- Underground electrical
- Indicates Overhead Lines
- Gas
- Water
- Sewer
- Culvert/ Storm Drain



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2, 3, 3A & Modified 3A LAYOUT L-1

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

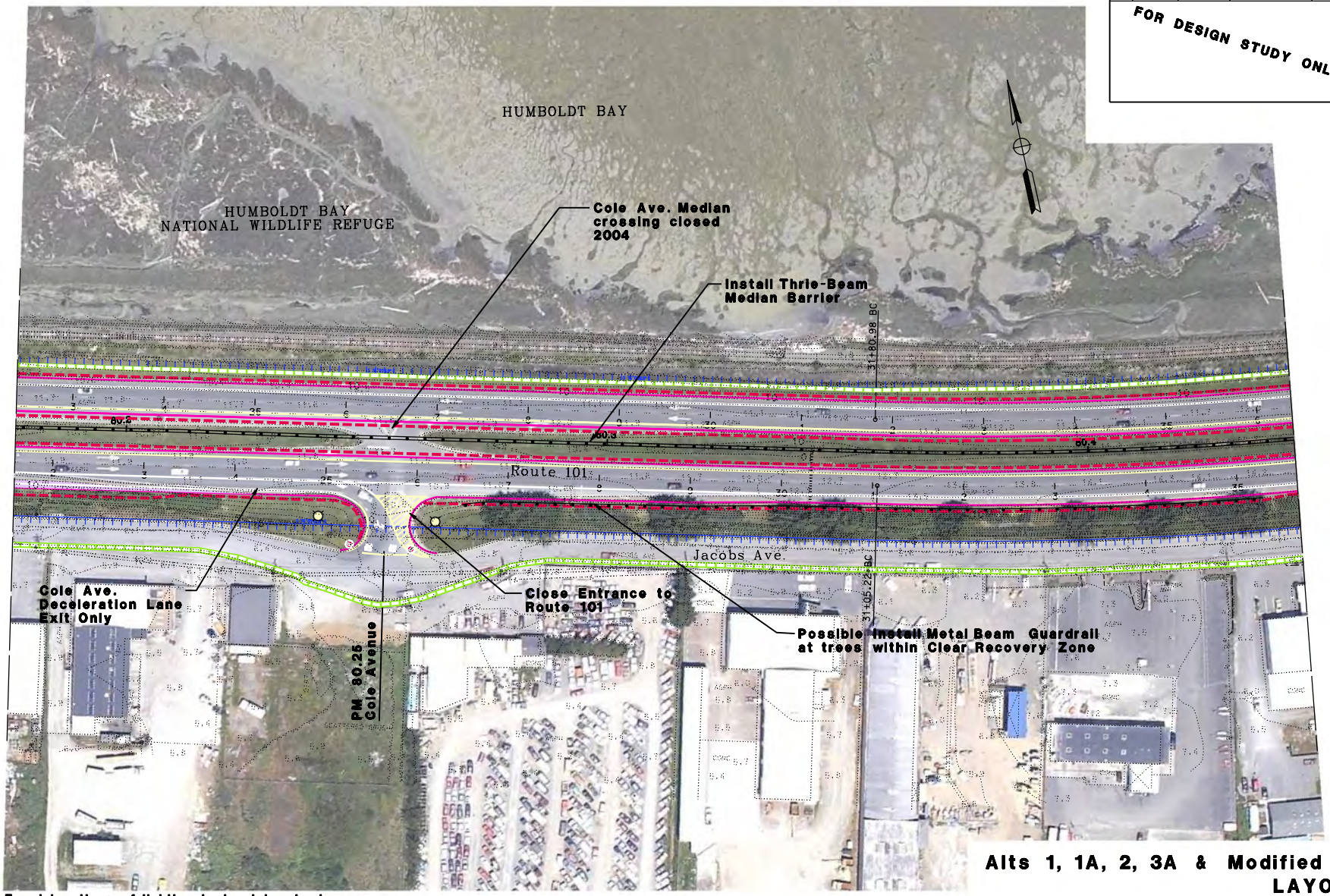
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:17

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea001.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2, 3A & Modified 3A
LAYOUT
L-2

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

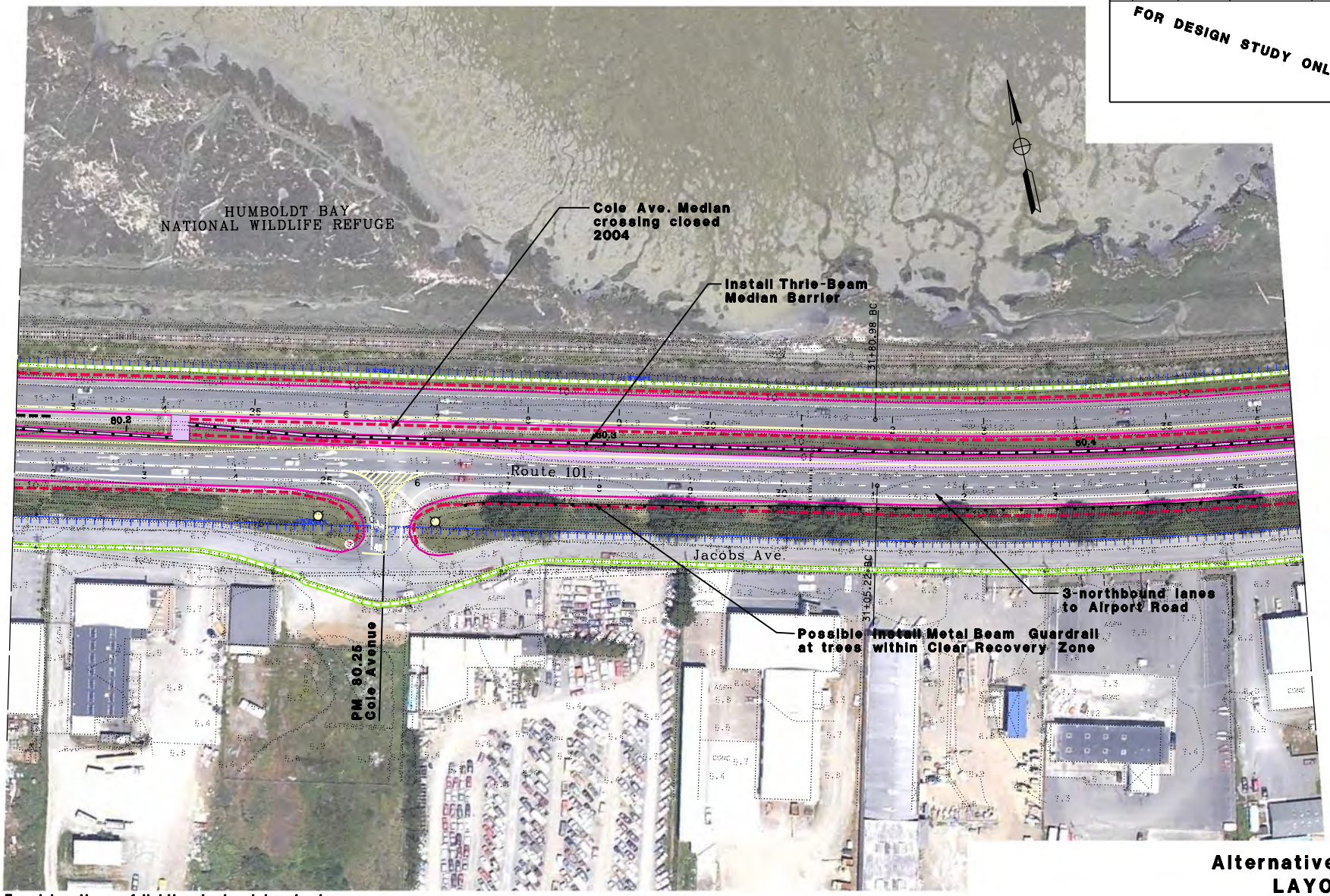
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:17

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea002.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

SCALE: 1"=50'

Alternative 3
LAYOUT
L-2 (ii)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

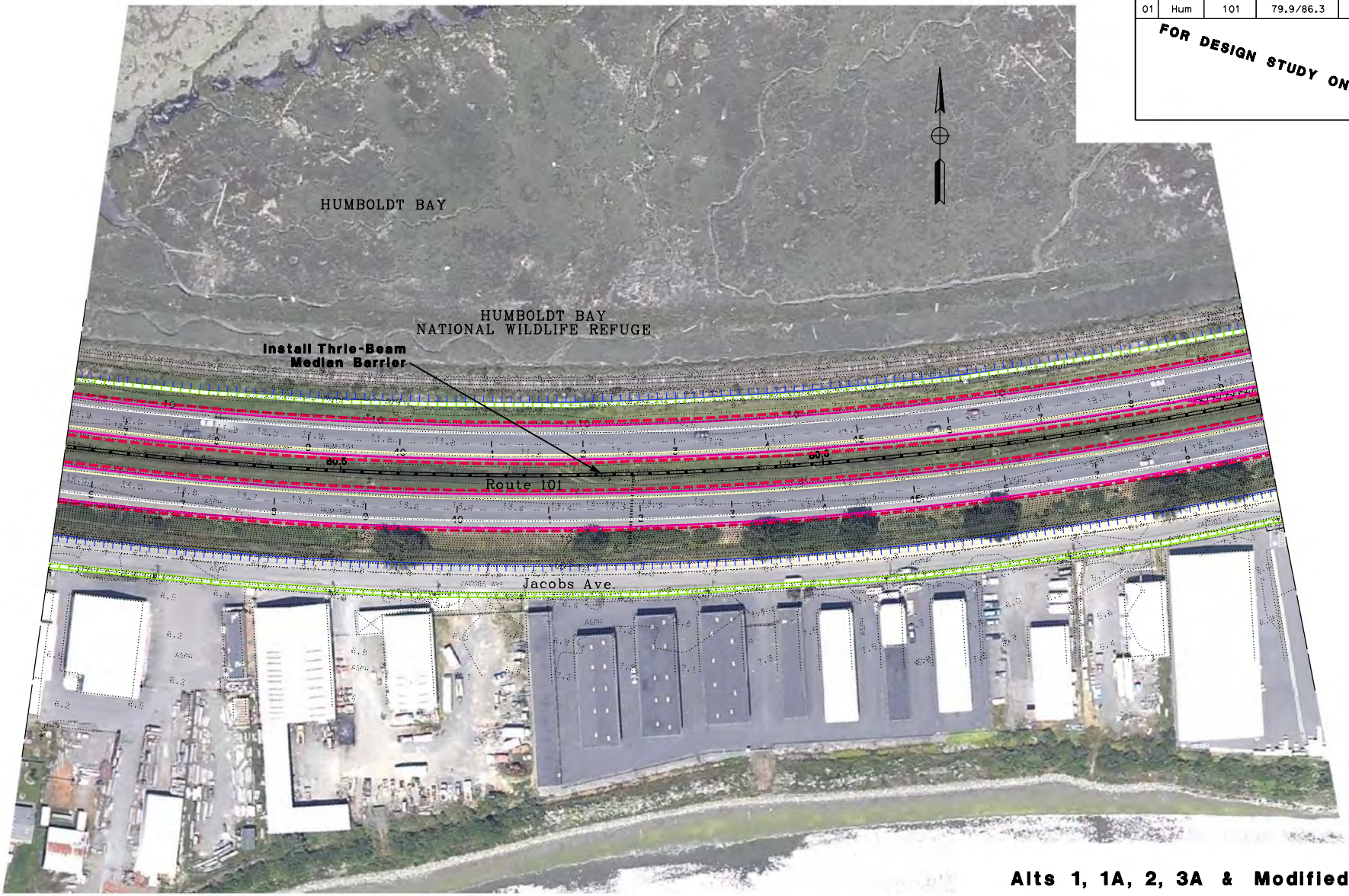
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:17

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea002-alt3.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 1A, 2, 3A & Modified 3A

LAYOUT
L-3

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

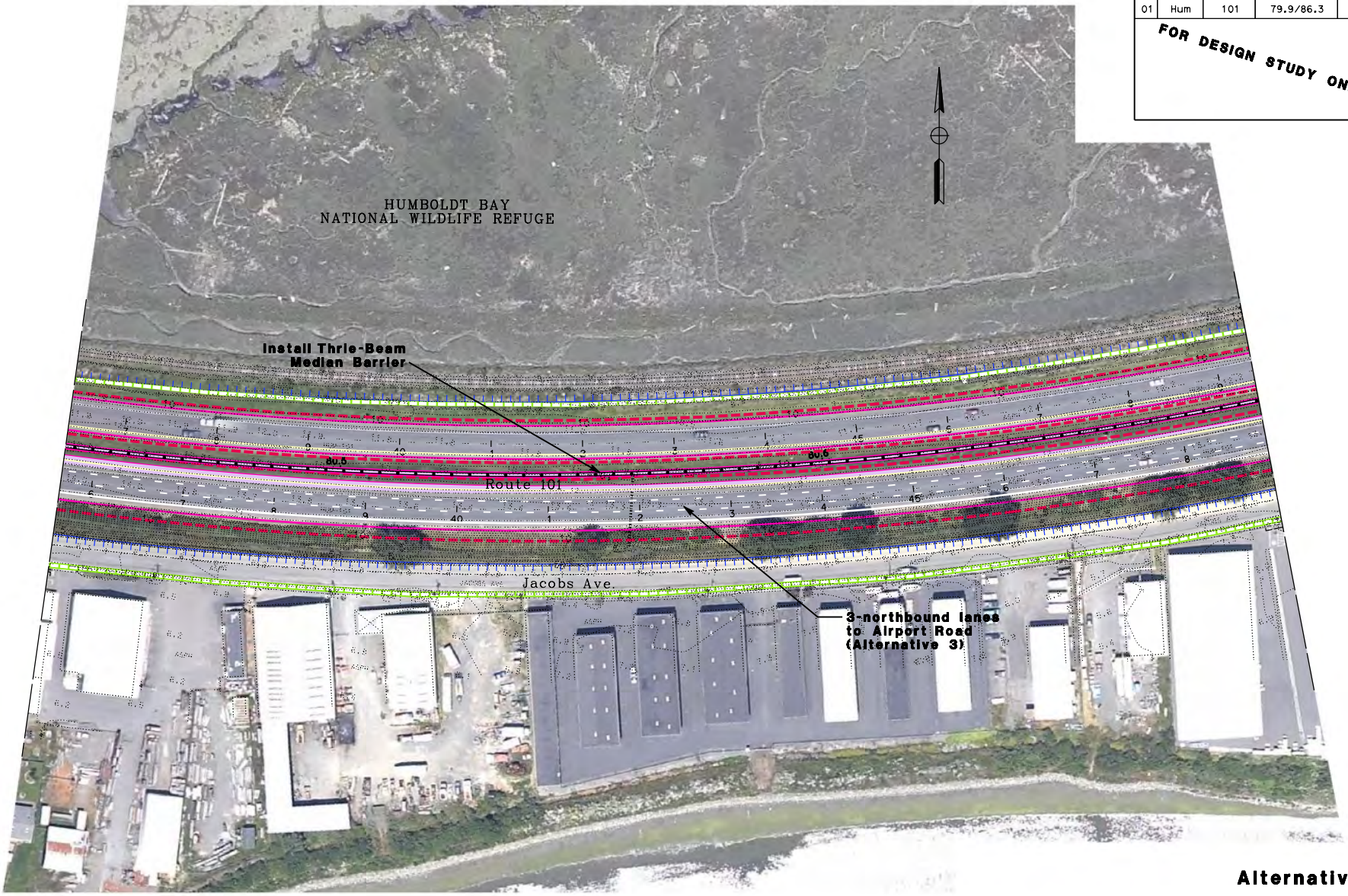
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:17

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea003.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



SCALE: 1"=50'

Alternative 3

LAYOUT

L-3 (ii)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	TODD LARK	REVISED BY	
Caltrans DESIGN	L.R. ASHLEY	CHECKED BY		DATE REVISED	

LAST REVISION 08-11-08 DATE PLOTTED => 12-OCT-2012 TIME PLOTTED => 15:17

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s119316 DGN FILE => 136330ea003-alt3.dgn | CU 03232 | EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alternatives 1A & 3A
LAYOUT
L-4

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:17

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea004.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

Exact locations of lighting to be determined.
Trenching for lighting not shown.

SCALE: 1"=50'

Alternatives 1 & 2
LAYOUT
L-4 (ii)

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:17

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

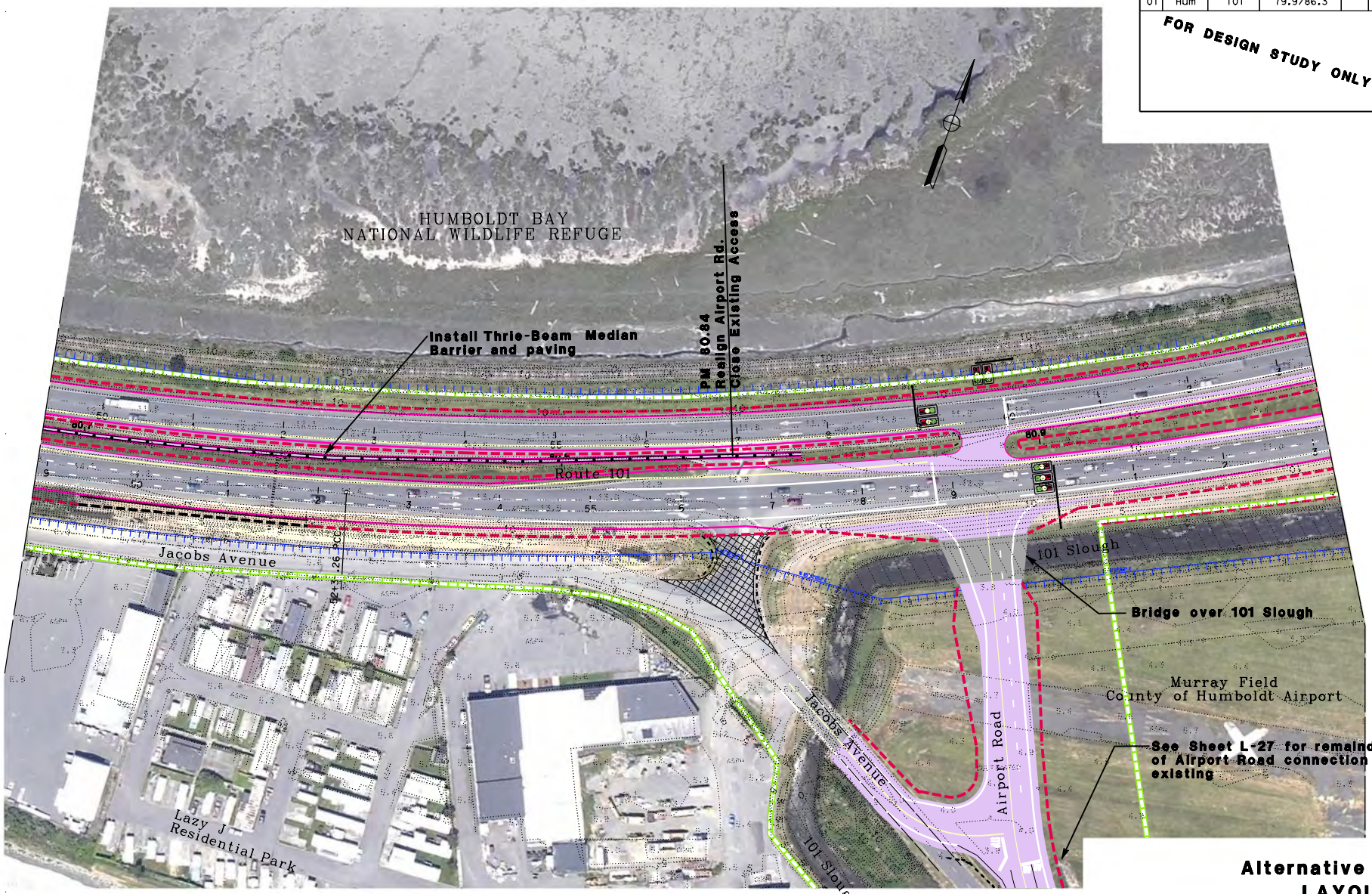
USERNAME => s119316
DGN FILE => 136330ea004-alt2.dgn

CU 03232

EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

SCALE: 1"=50'

Alternative 3
LAYOUT
L-4 (iii)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

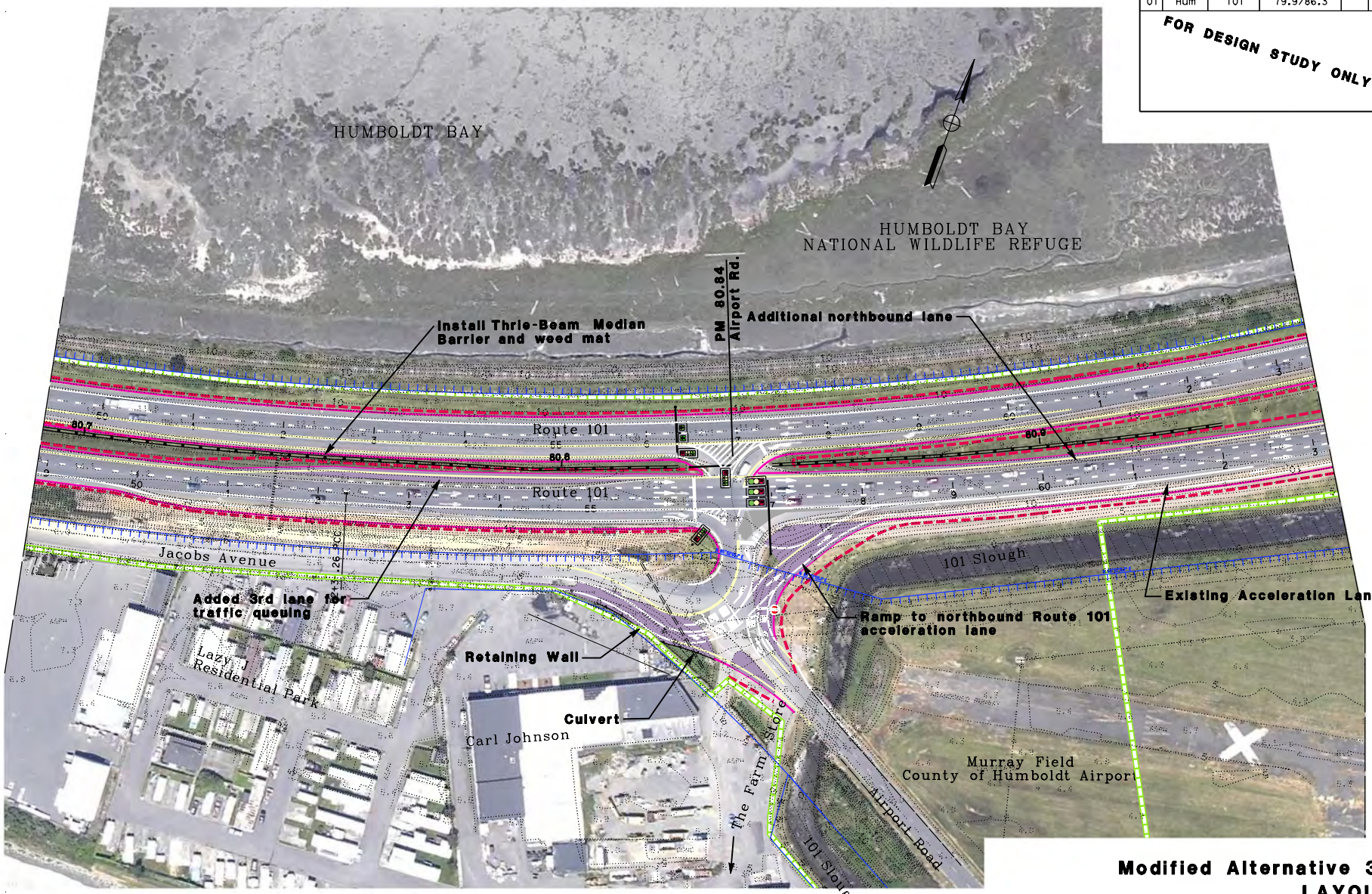
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:17

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea004-alt3.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Modified Alternative 3A
LAYOUT
L-4 (iv)

SCALE: 1"=50'

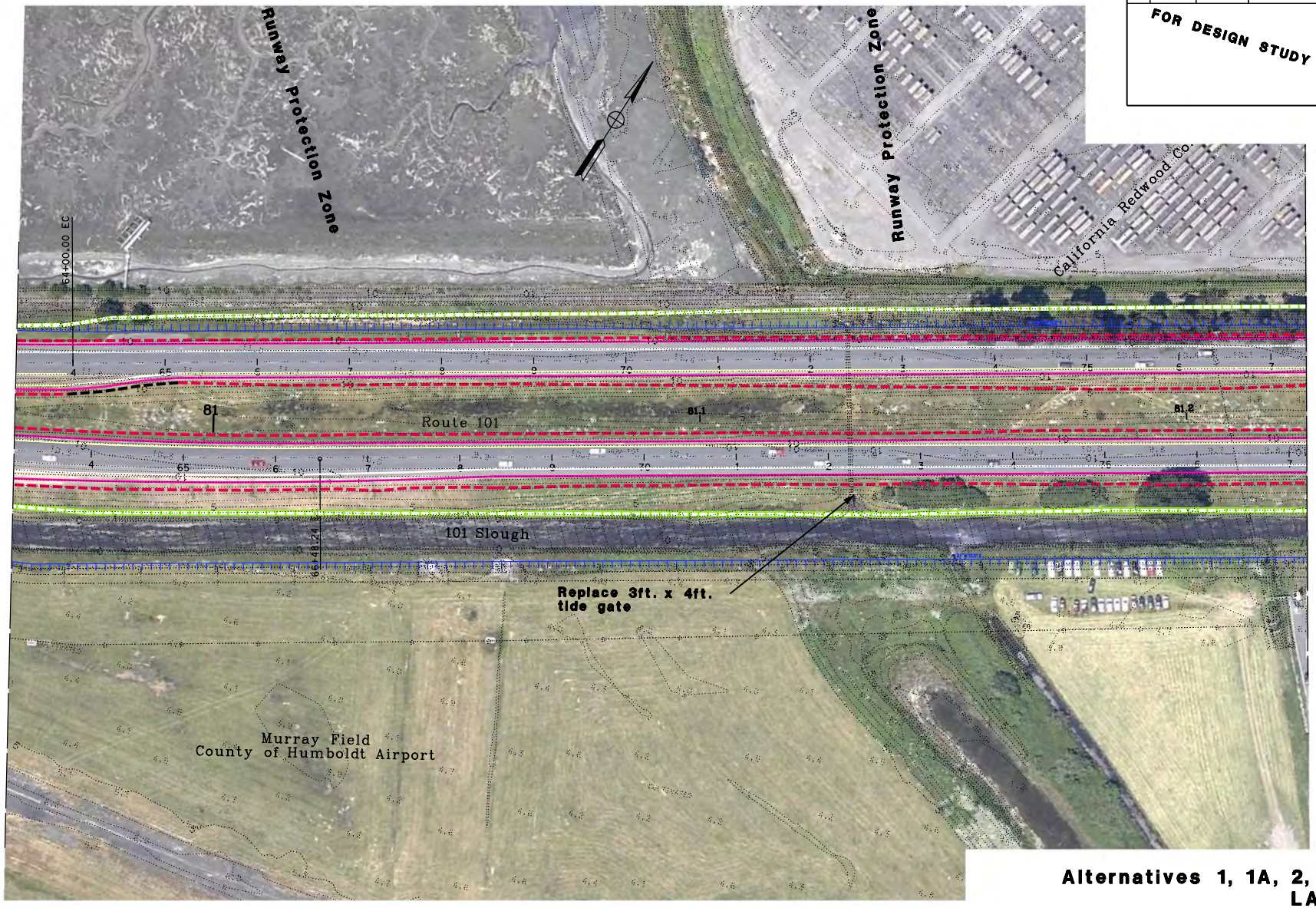
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	TODD LARK	REVISED BY	
Caltrans DESIGN	L.R. ASHLEY	CHECKED BY		DATE REVISED	

LAST REVISION 08-11-08 | DATE PLOTTED => 12-OCT-2012 | TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s119316 | DGN FILE => 136330ea004-rev.dgn | CU 03232 | EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternatives 1, 1A, 2, & 3A
LAYOUT
L-5

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

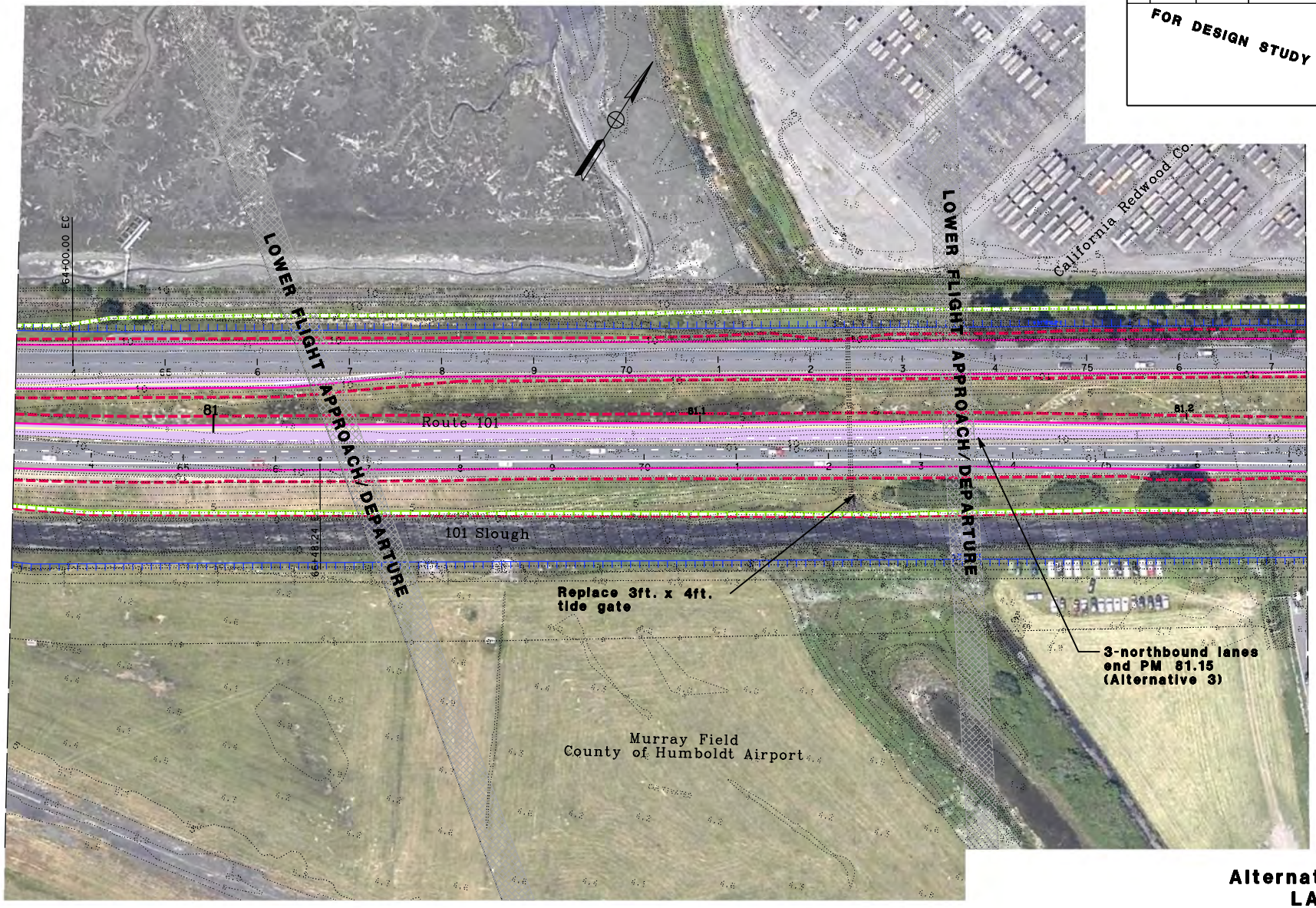
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea005.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternative 3
LAYOUT
L-5 (ii)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

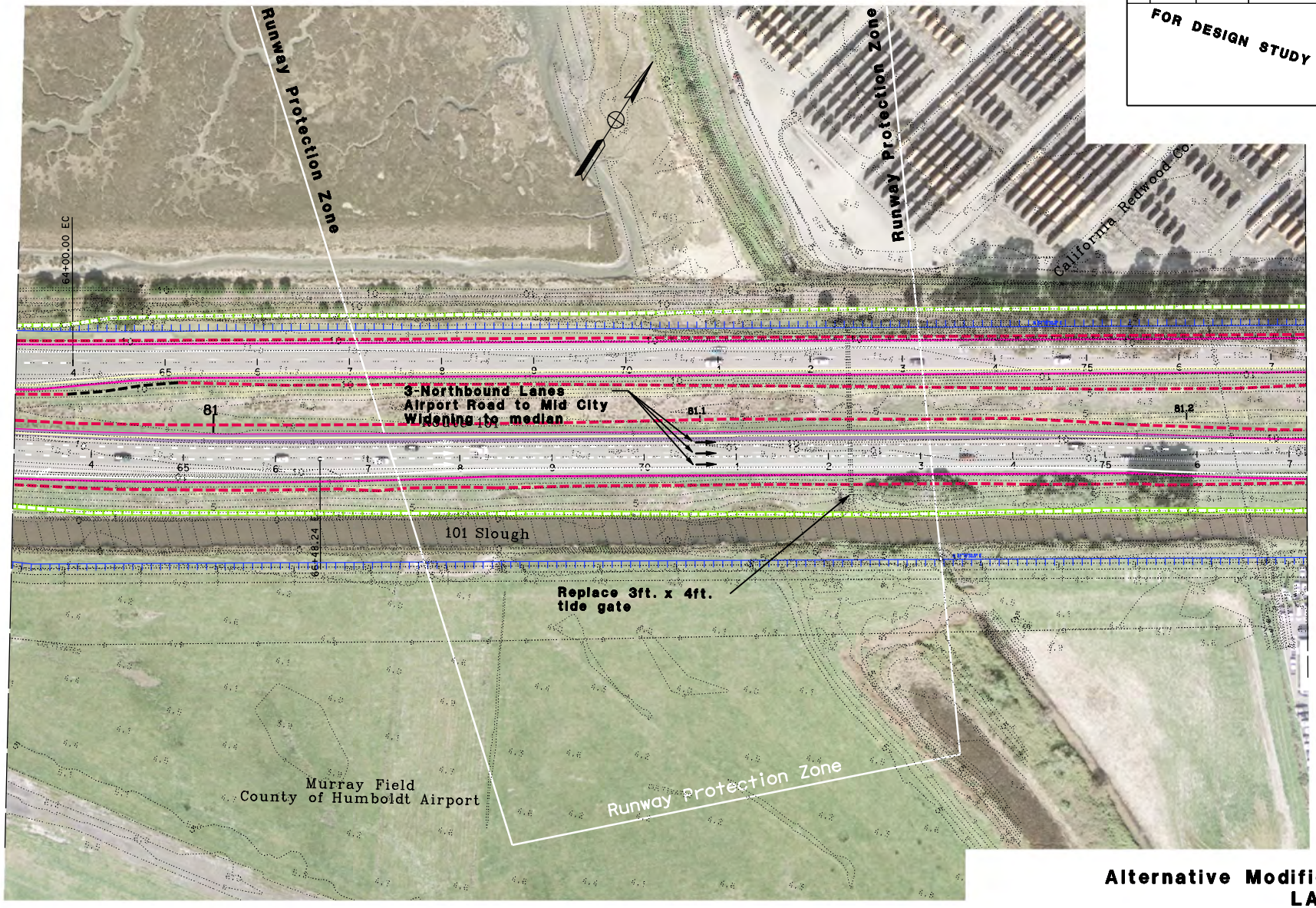
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea005-alt3.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternative Modified 3A
LAYOUT
L-5 (iii)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

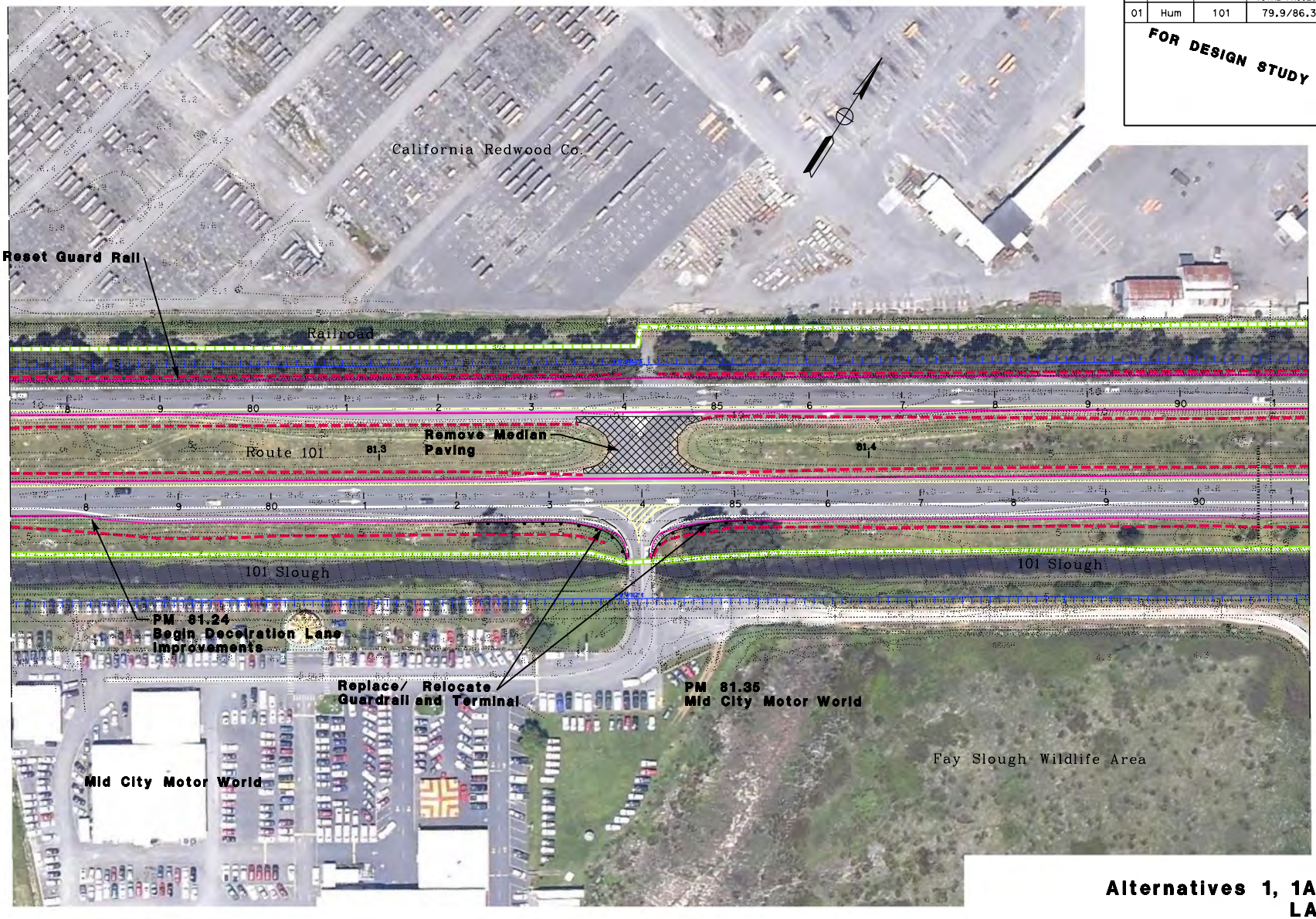
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea005-rev.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternatives 1, 1A, & 2
LAYOUT
L-6

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

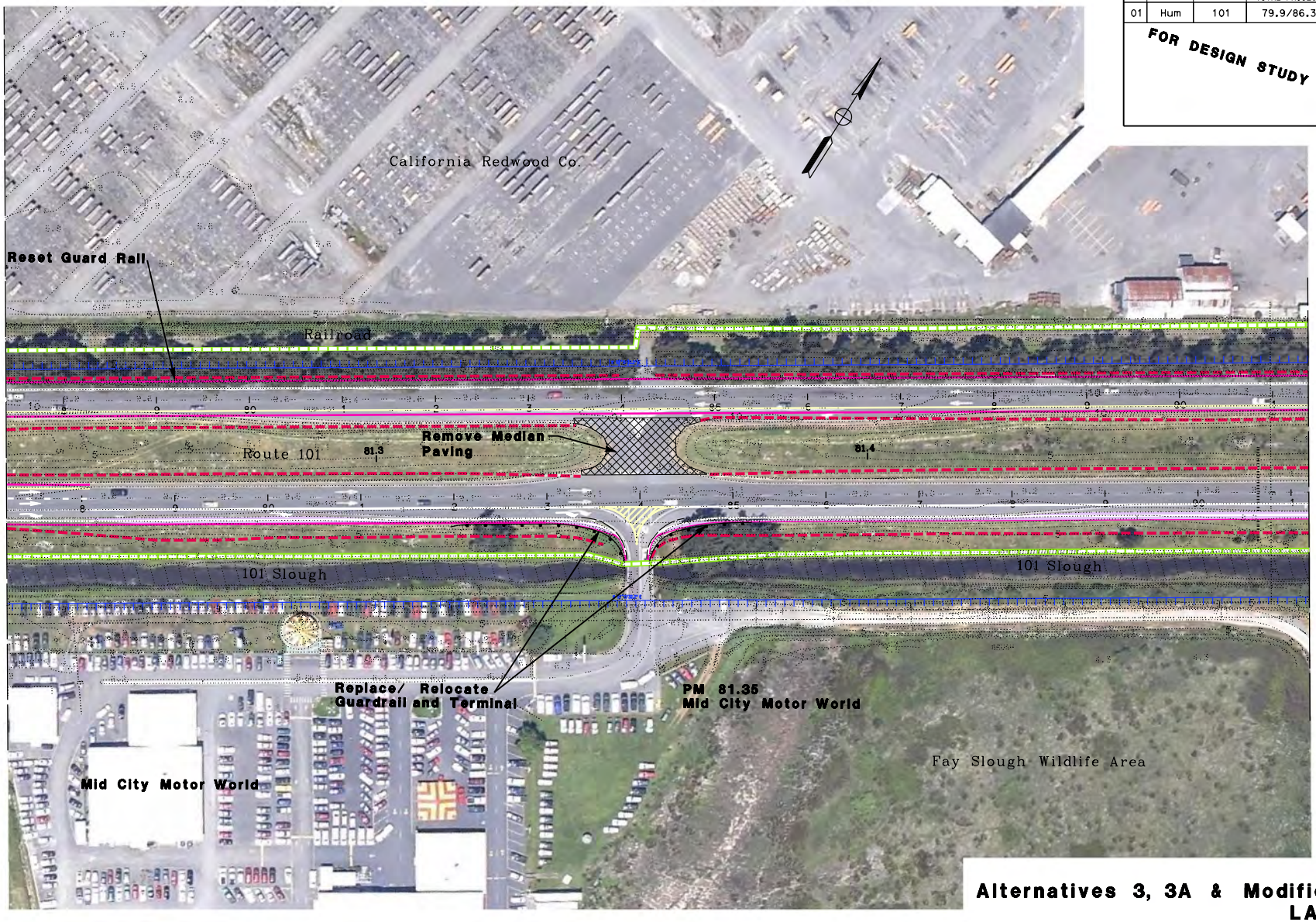
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea006.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternatives 3, 3A & Modified 3A
LAYOUT
L-6 (i)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

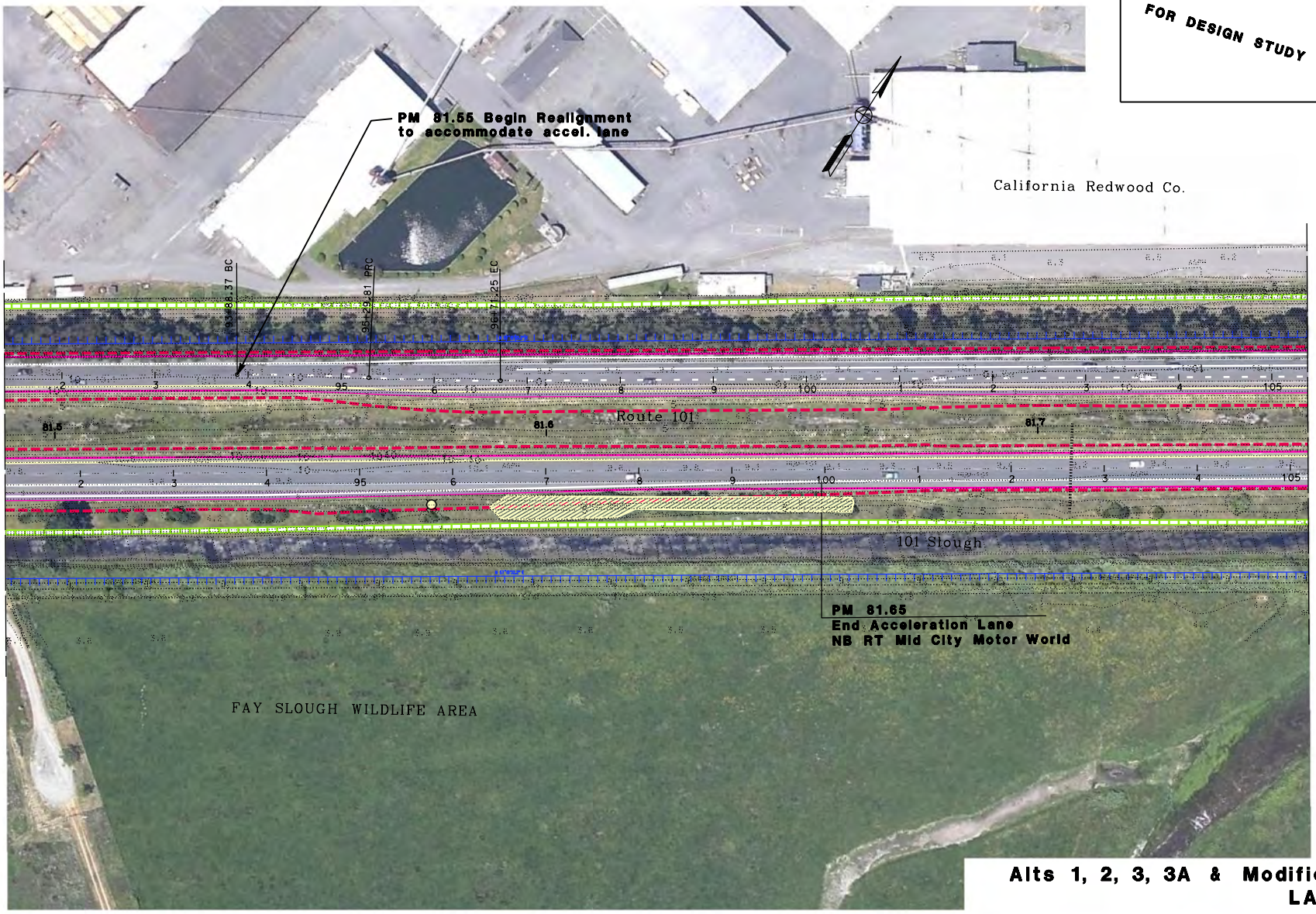
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea006-rev.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 2, 3, 3A & Modified 3A
LAYOUT
L-7

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

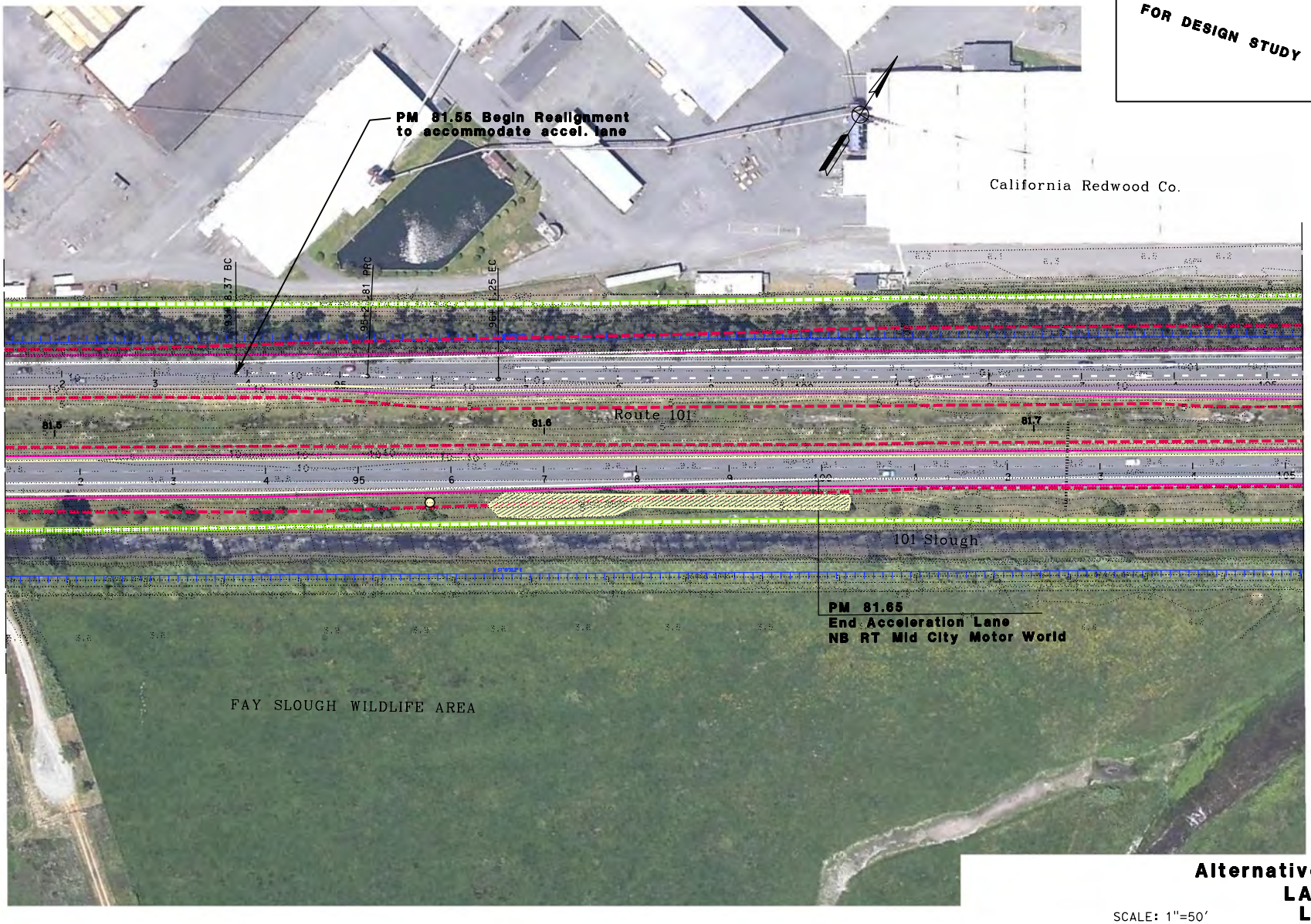
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea007.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternatives 1A
LAYOUT
L-7 (i)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

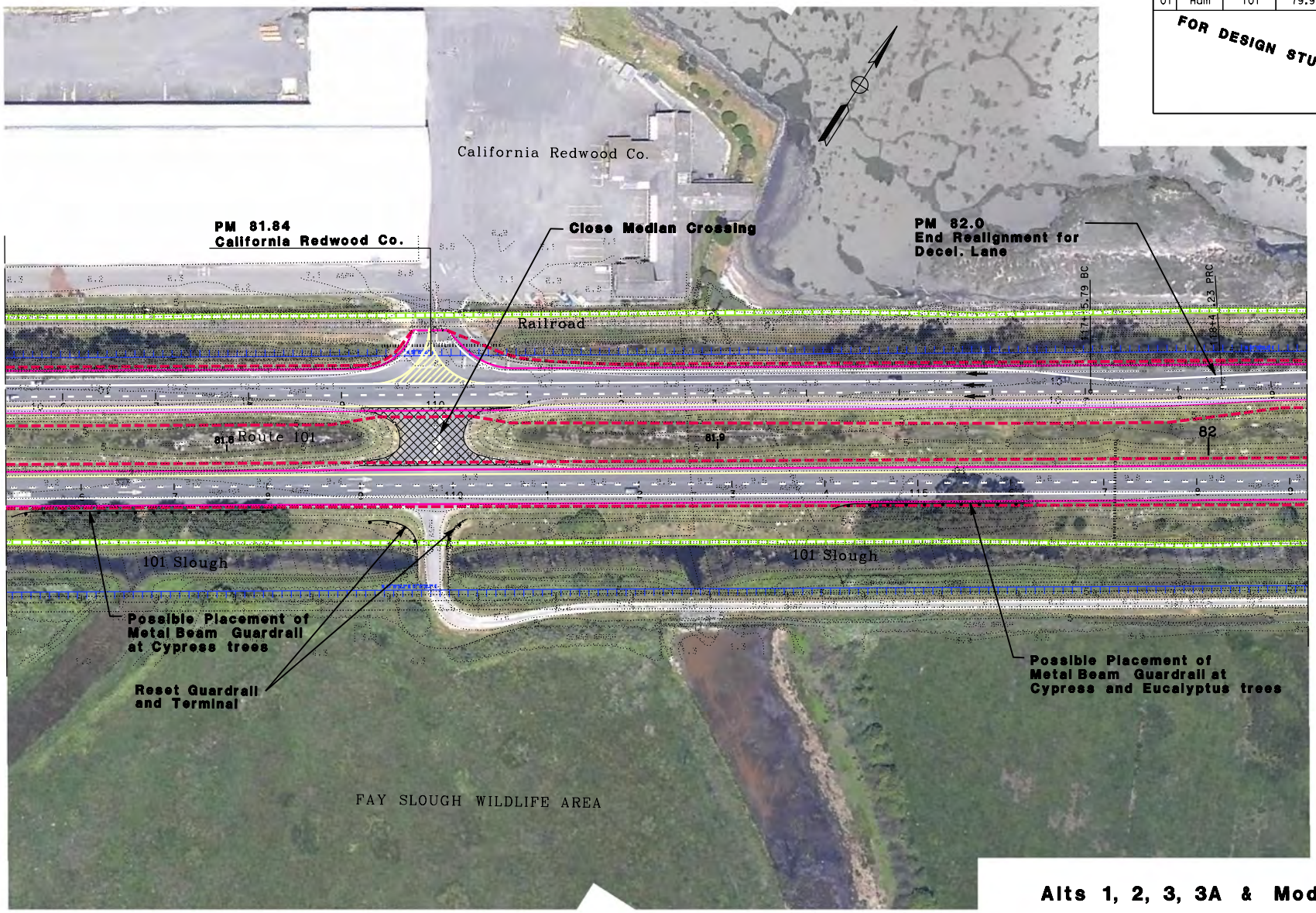
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea007al11a.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 2, 3, 3A & Modified 3A
LAYOUT
L-8

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

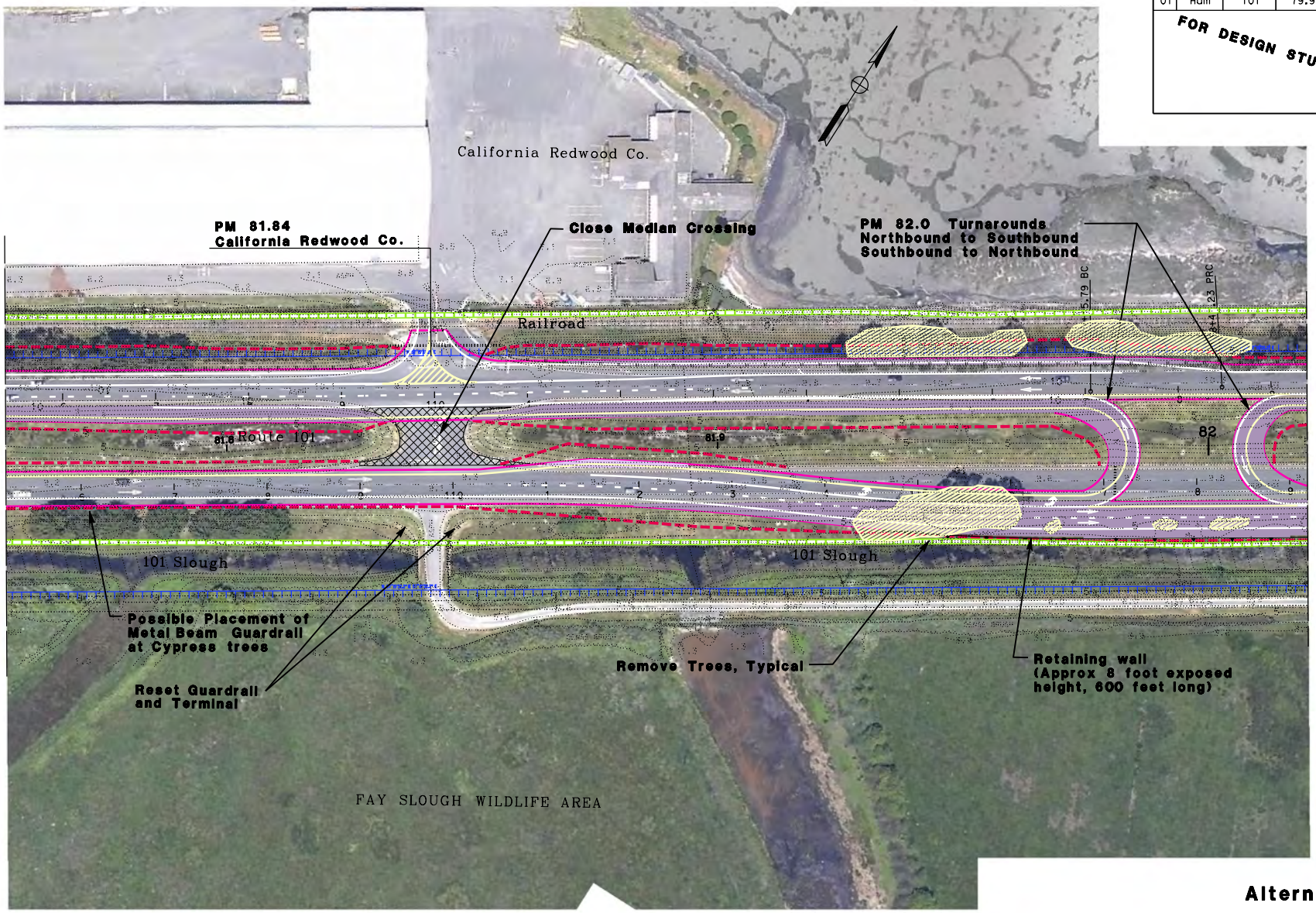
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea008.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternative 1A
LAYOUT
L-8 (i)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

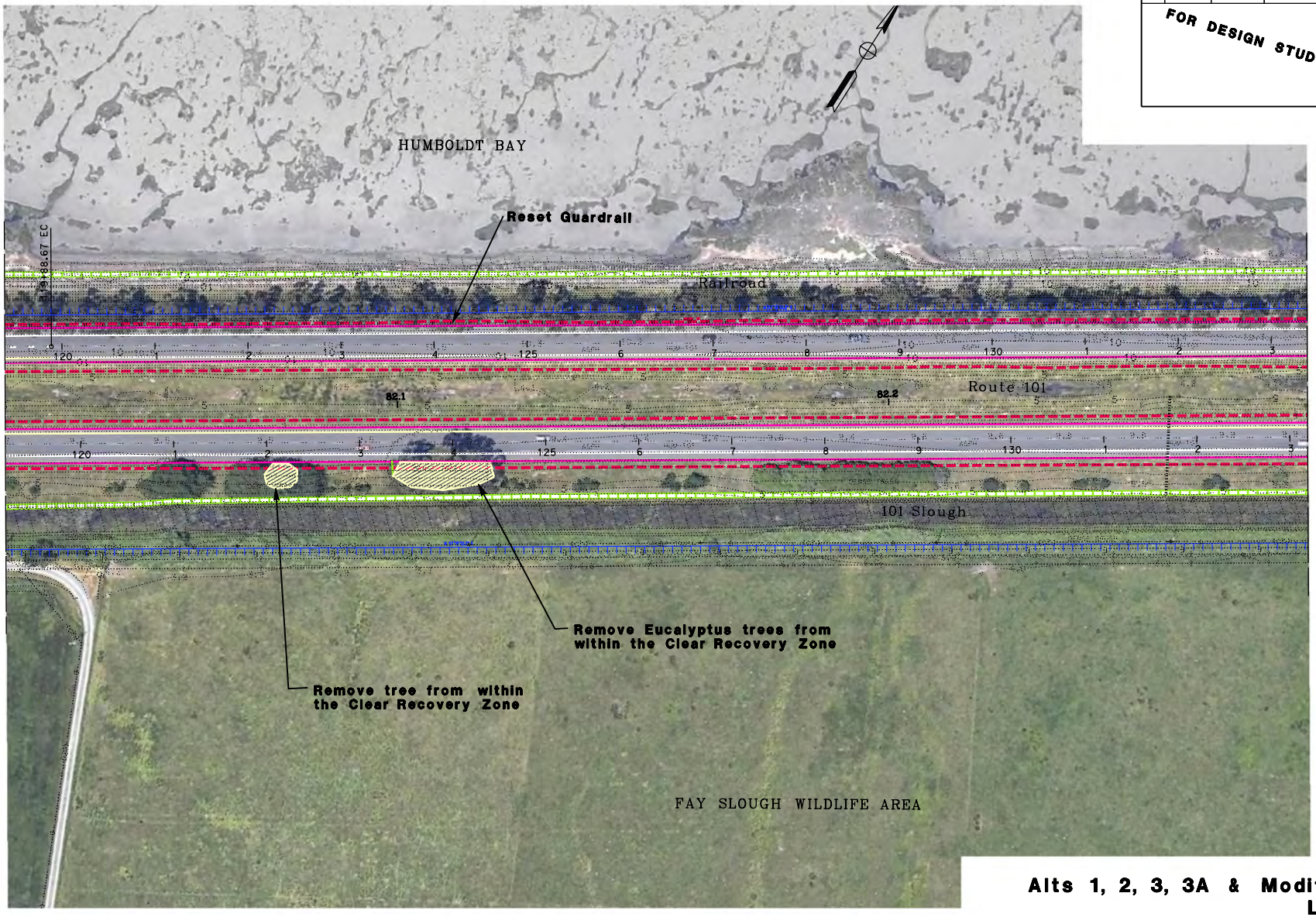
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea008alt1a.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 2, 3, 3A & Modified 3A
LAYOUT
L-9

SCALE: 1"50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

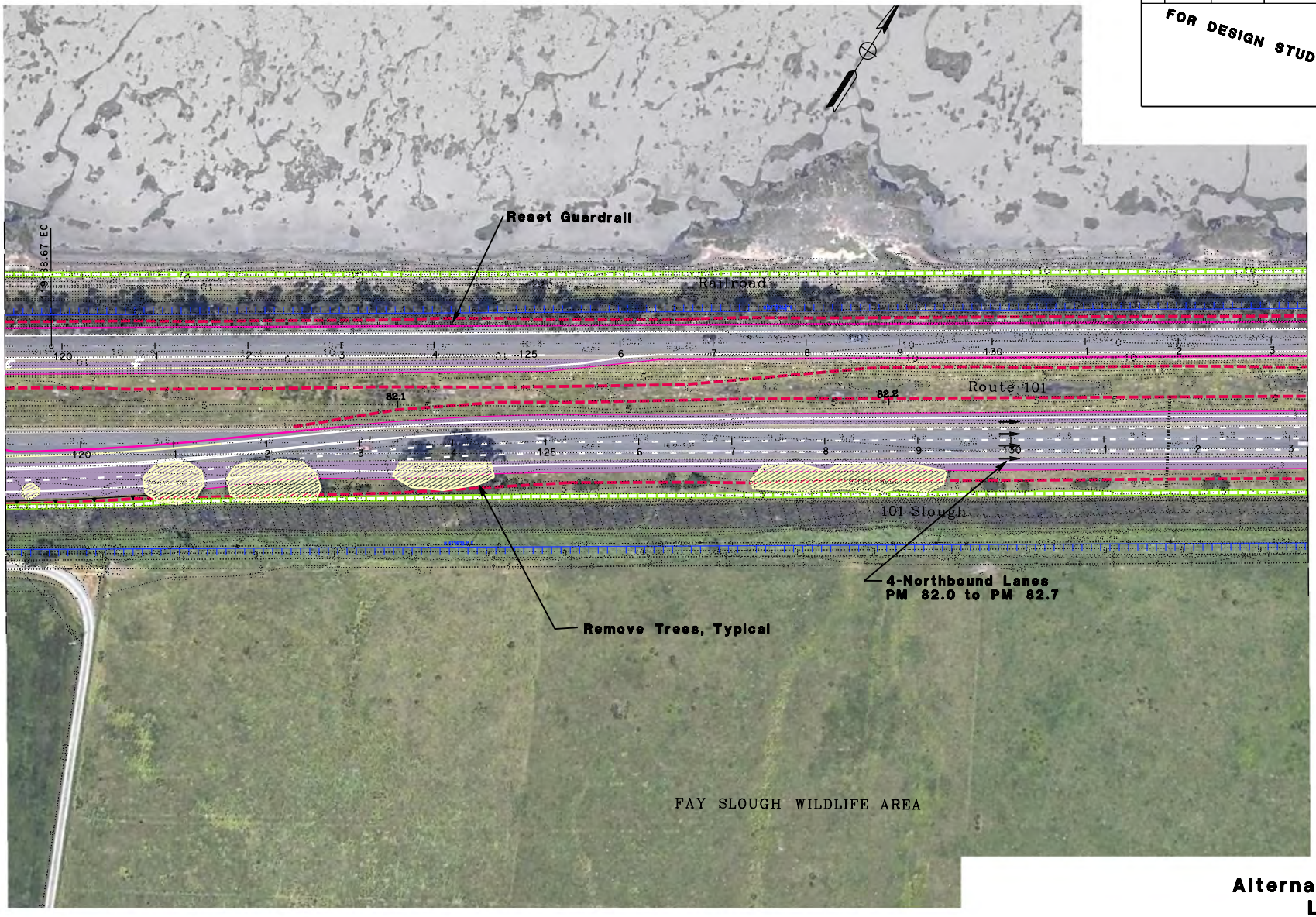
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:23

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea009.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternative 1A
LAYOUT
L-9 (i)

SCALE: 1"50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

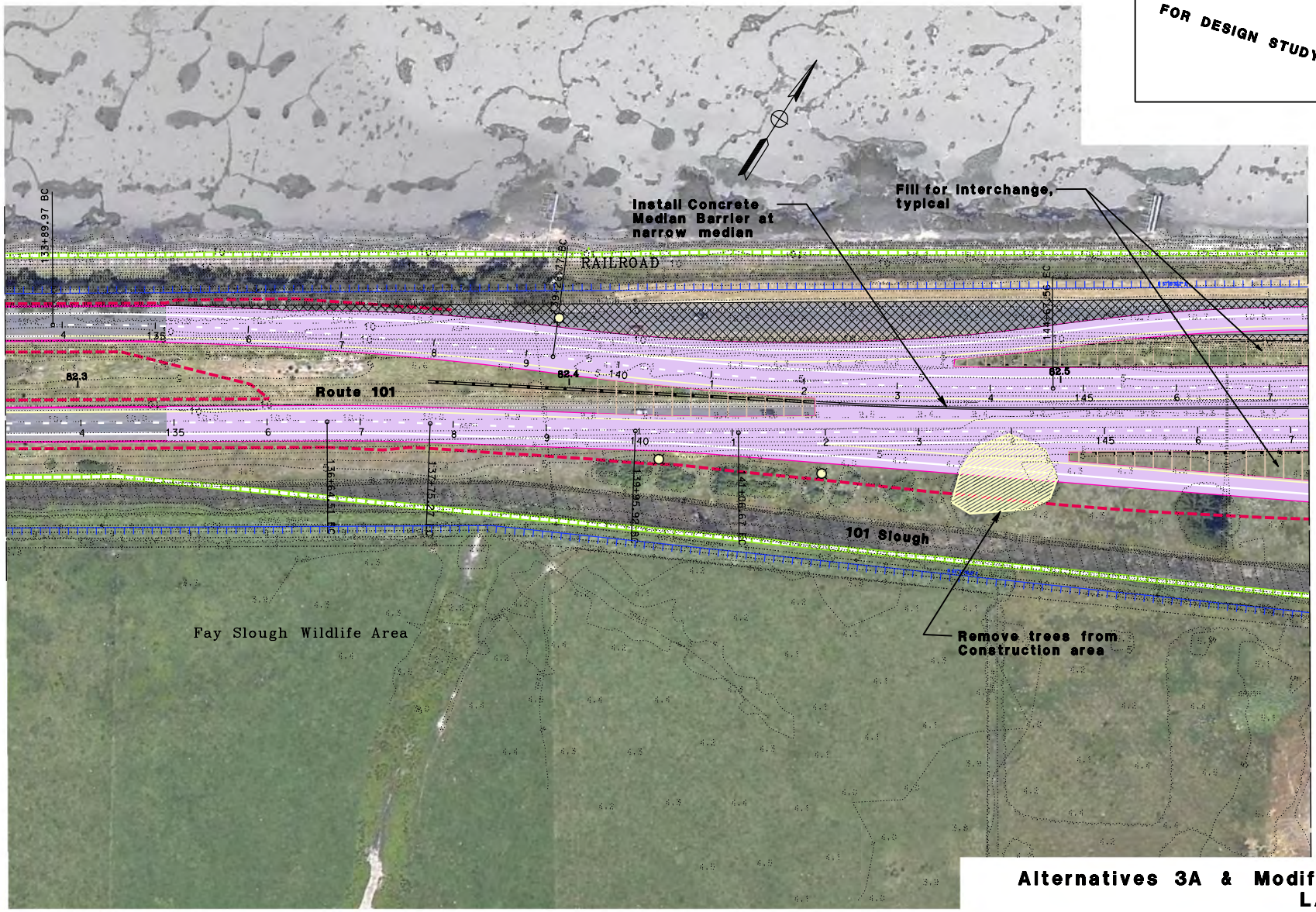
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea009alt1a.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alternatives 3A & Modified 3A LAYOUT L10

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DESIGN

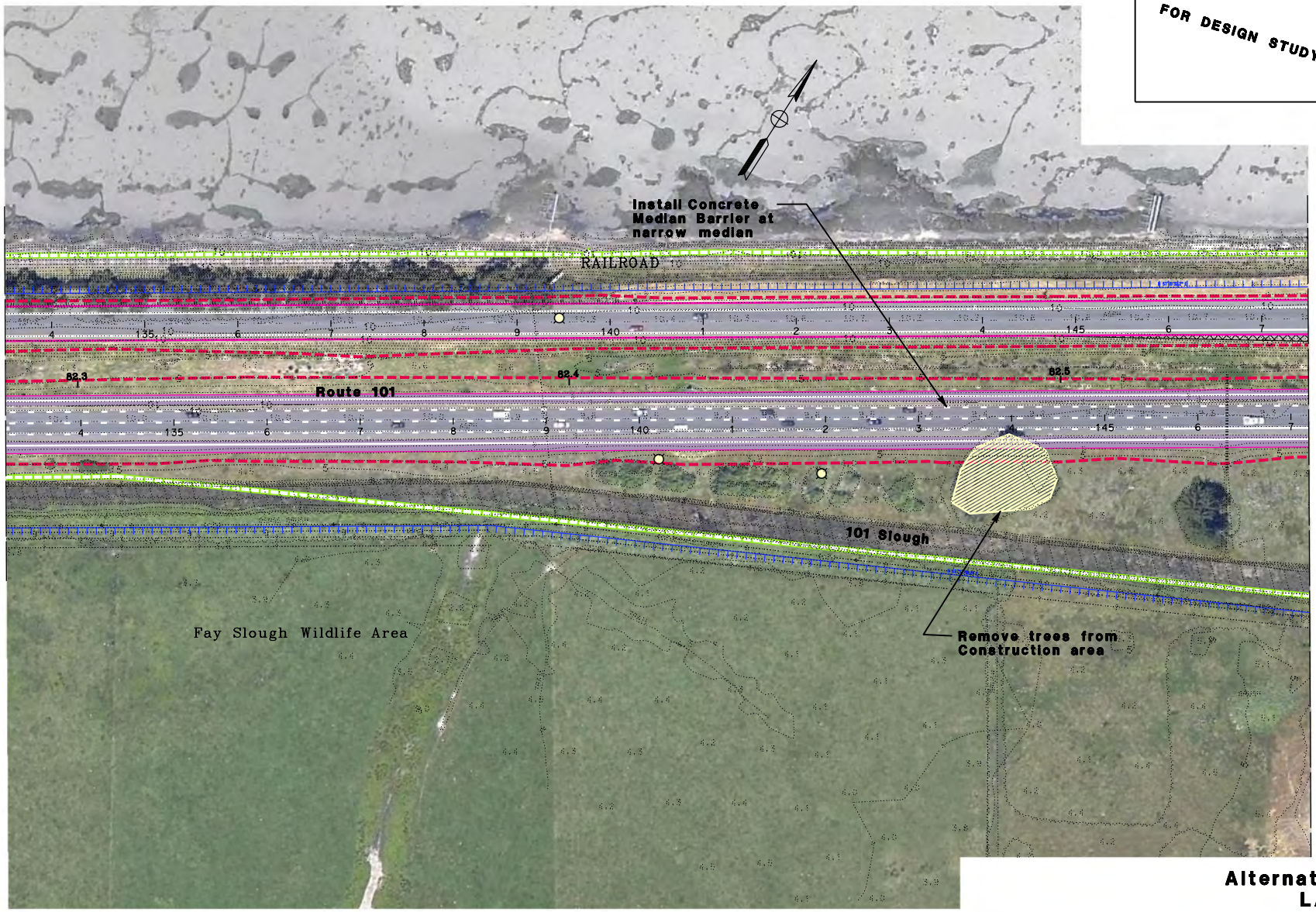
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea010.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

SCALE: 1"=50'

Alternative 1A LAYOUT L10 (i)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DESIGN

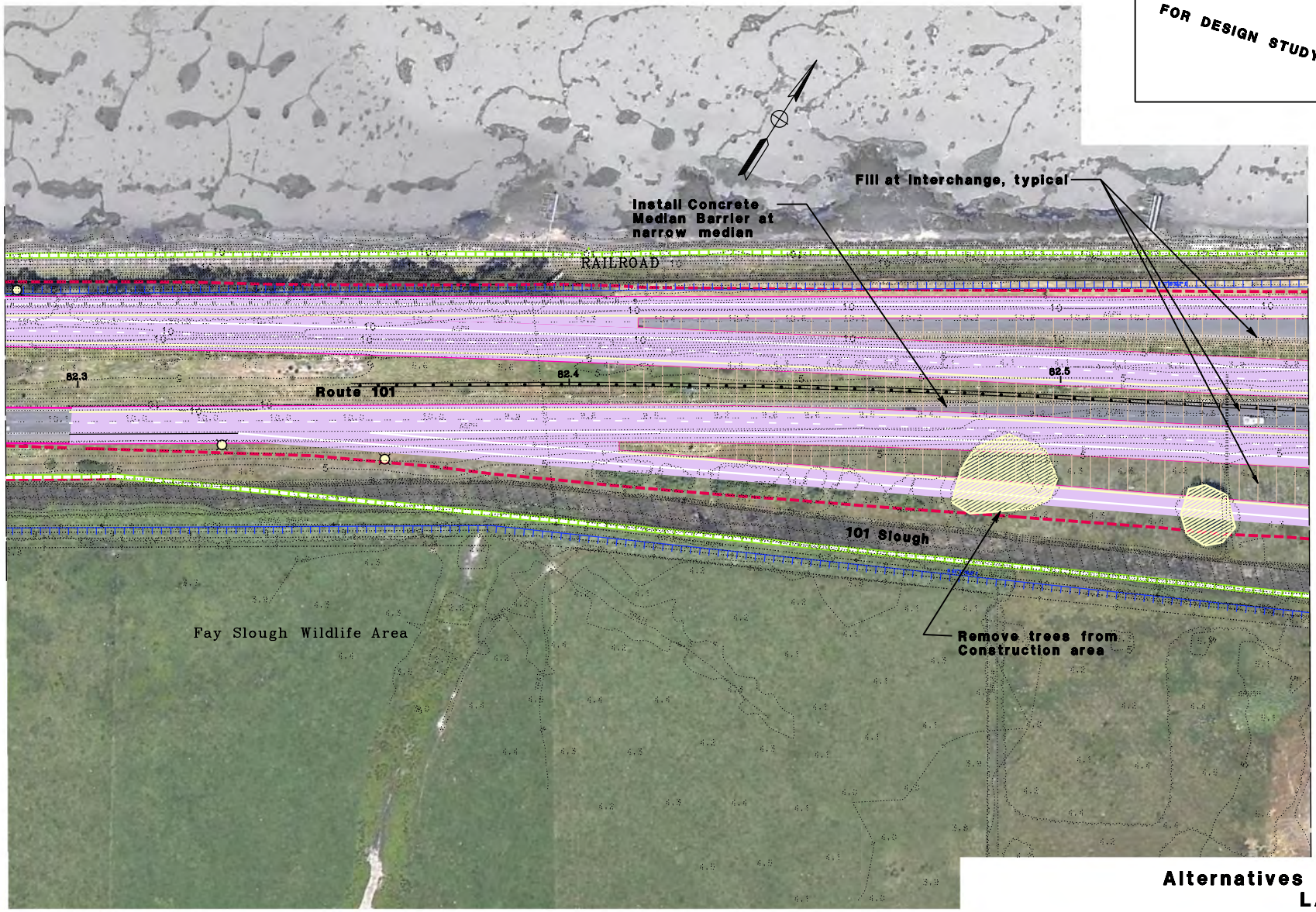
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea010alt1a.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alternatives 2 & 3 LAYOUT L10 (ii)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea010-alt3.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

Exact locations of lighting to be determined.
Trenching for lighting not shown.

SCALE: 1"=50'

Alternative 1
LAYOUT
L10 (iii)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

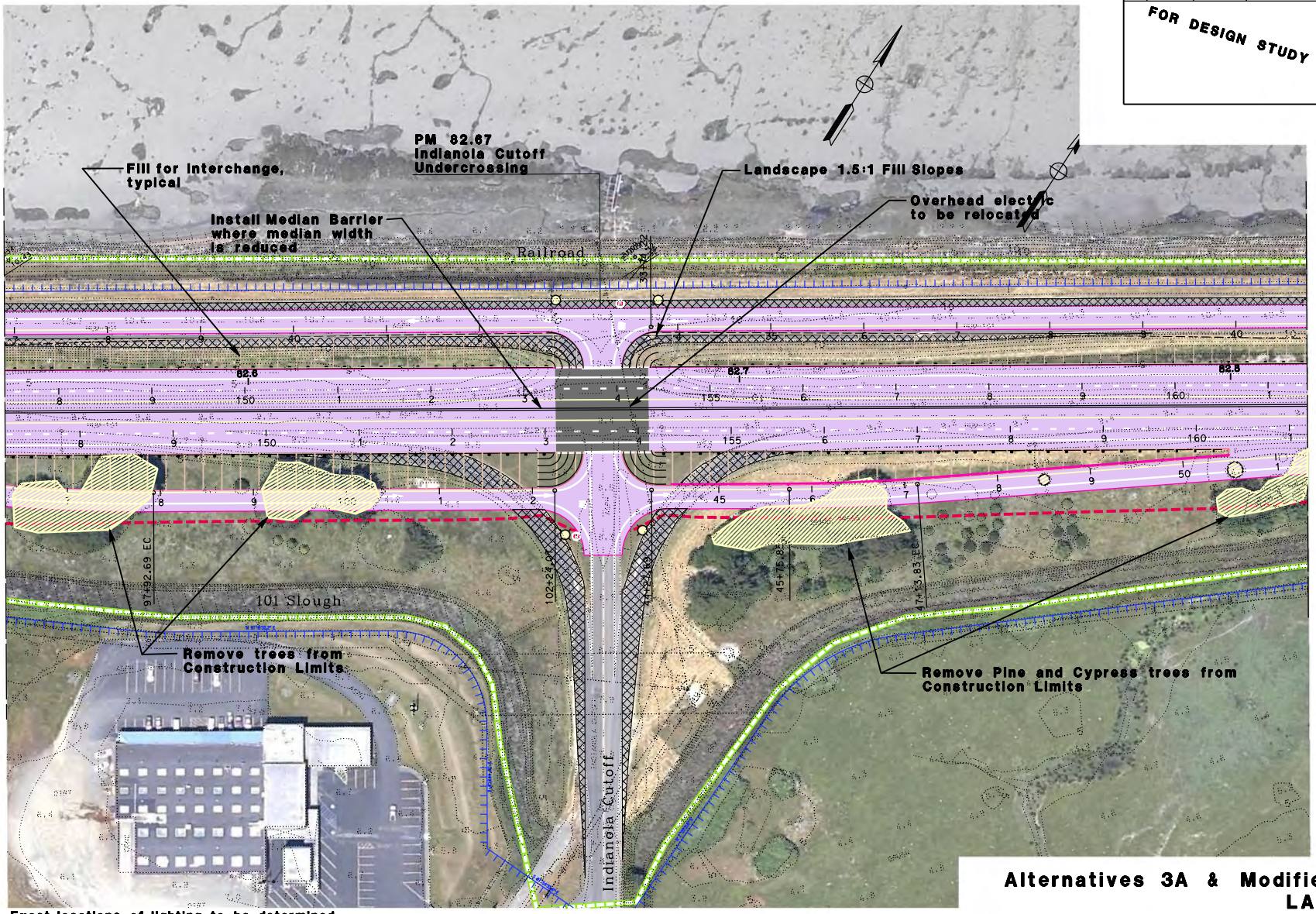
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea010alt1.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alternatives 3A & Modified 3A LAYOUT L-11

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DESIGN

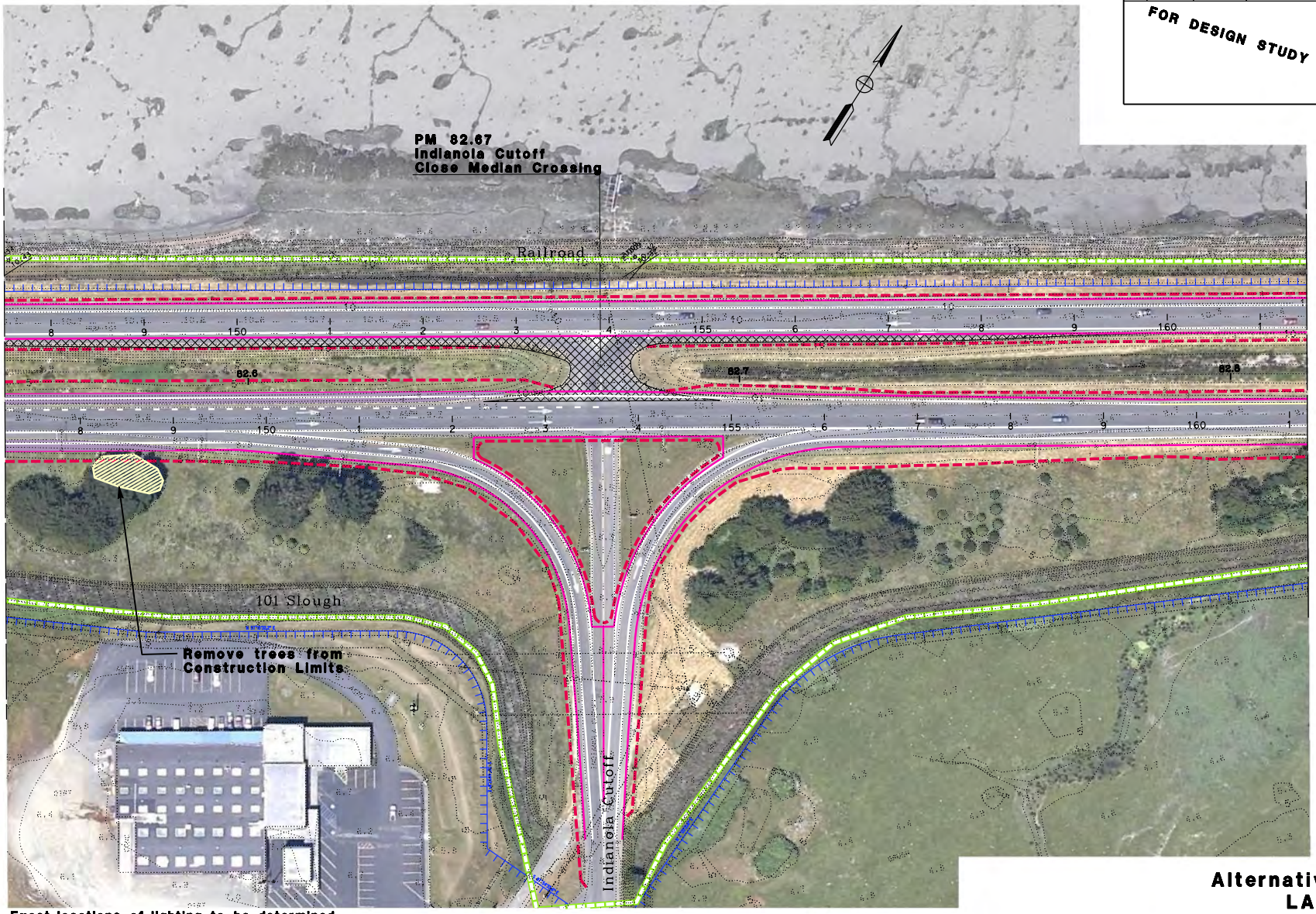
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea011.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

SCALE: 1"=50'

Alternative 1A
LAYOUT
L-11 (i)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
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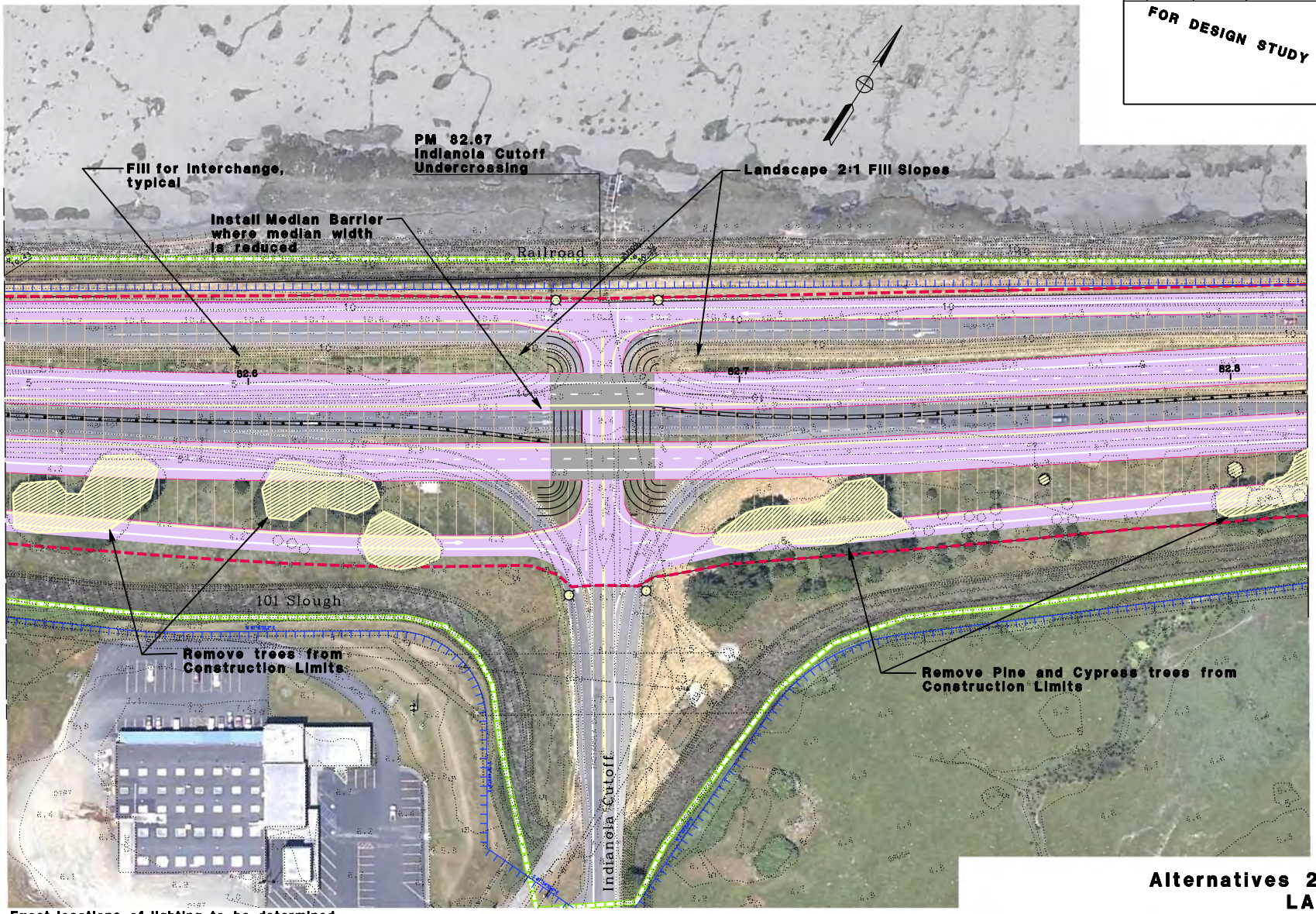
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea011alt1a.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

SCALE: 1"=50'

Alternatives 2 & 3
LAYOUT
L-11 (ii)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

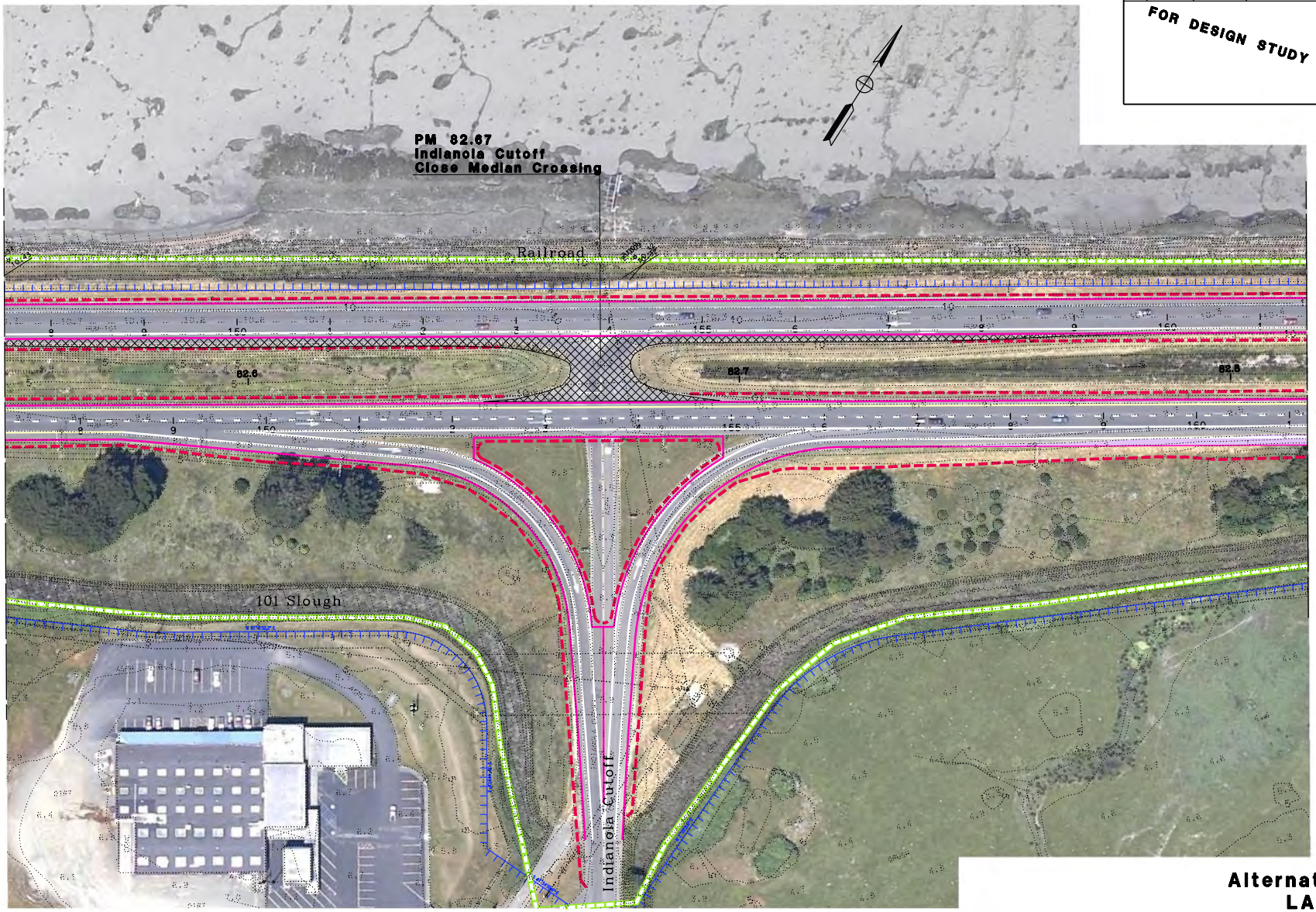
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea011-alt3.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternative 1
LAYOUT
L-11 (iii)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY

CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY:

REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

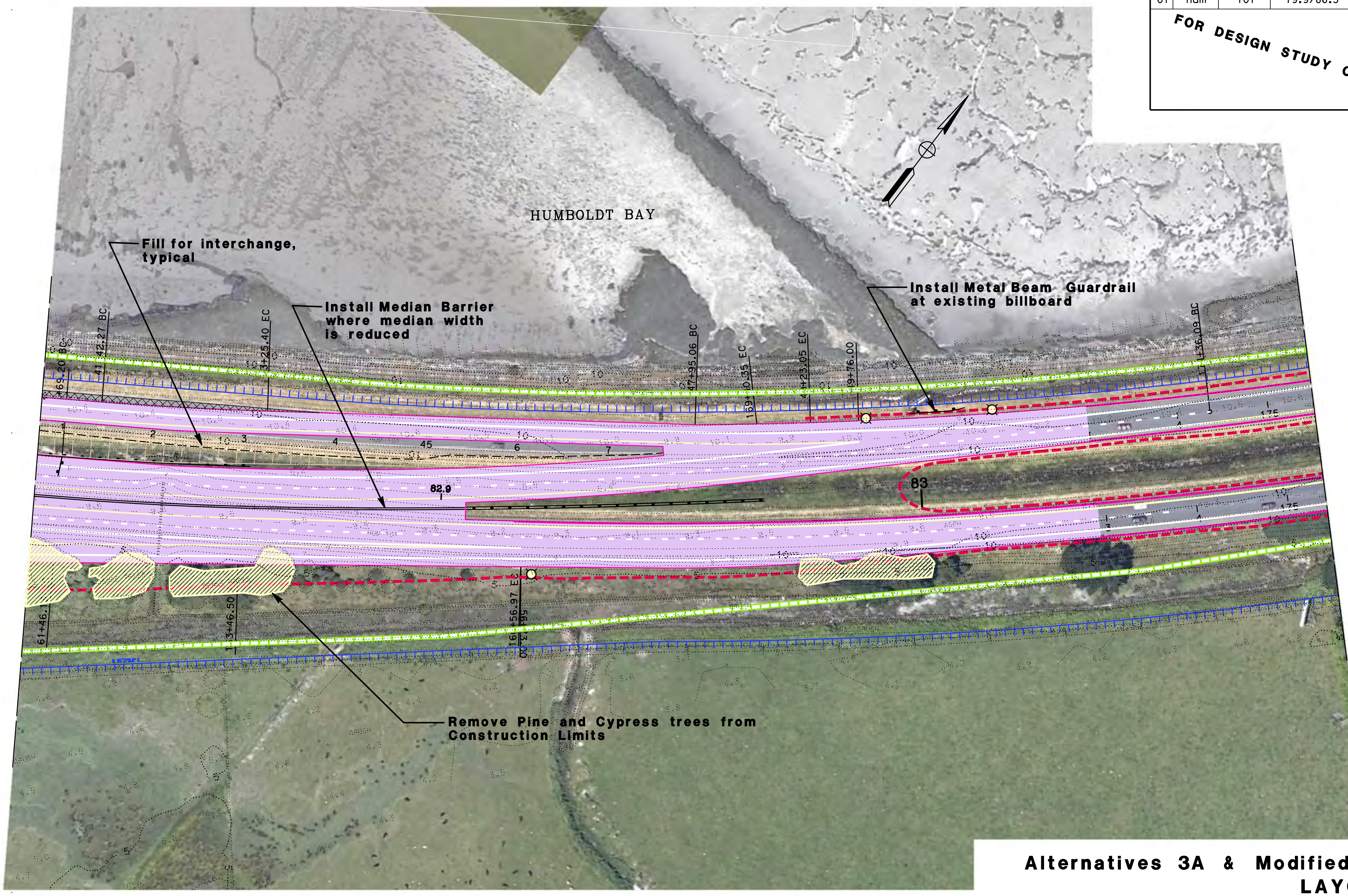
USERNAME => s119316
DGN FILE => 136330ea011alt1.dgn

CU 03232

EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alternatives 3A & Modified 3A
LAYOUT
L-12

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans® DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY

CALCULATED-DESIGNED BY / CHECKED BY

TODD LARK

REVISED BY / DATE REVISED

LAST REVISION 08-11-08

DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:24

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

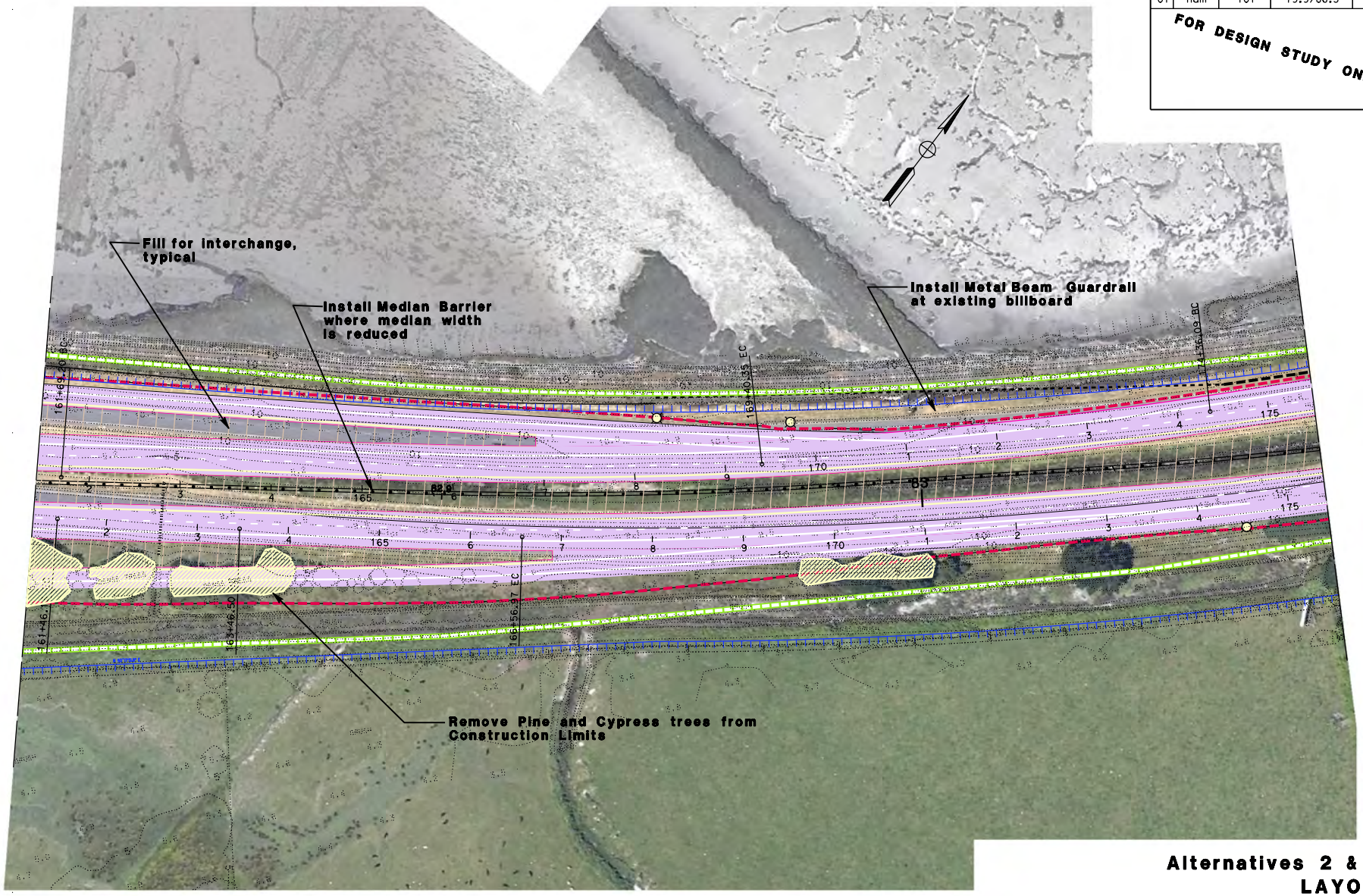
USERNAME => s119316
DGN FILE => 136330ea012.dgn

CU 03232

EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alternatives 2 & 3
LAYOUT
L-12 (ii)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

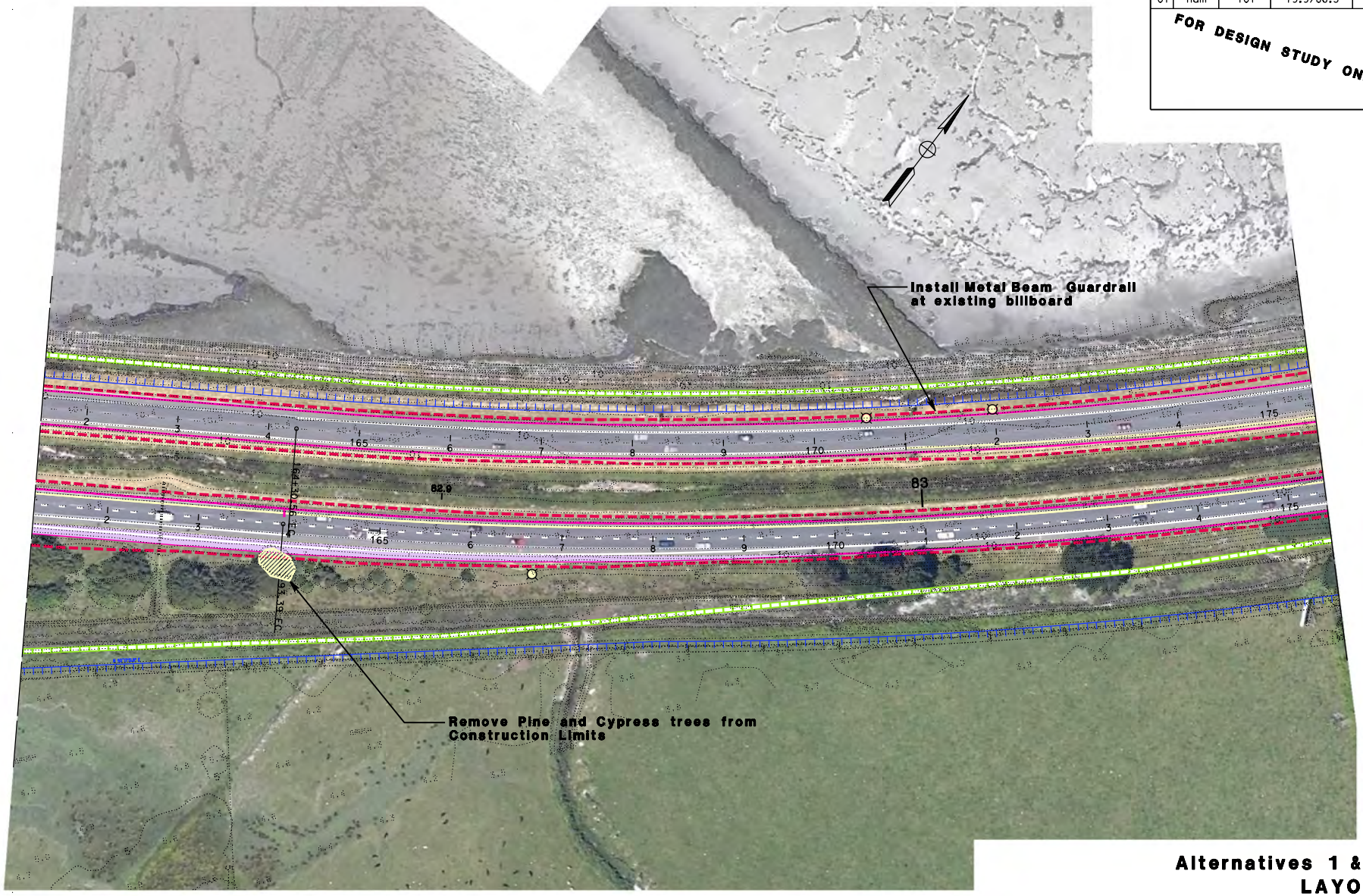
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:25

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea012-alt3.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternatives 1 & 1A
LAYOUT
L-12 (iii)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

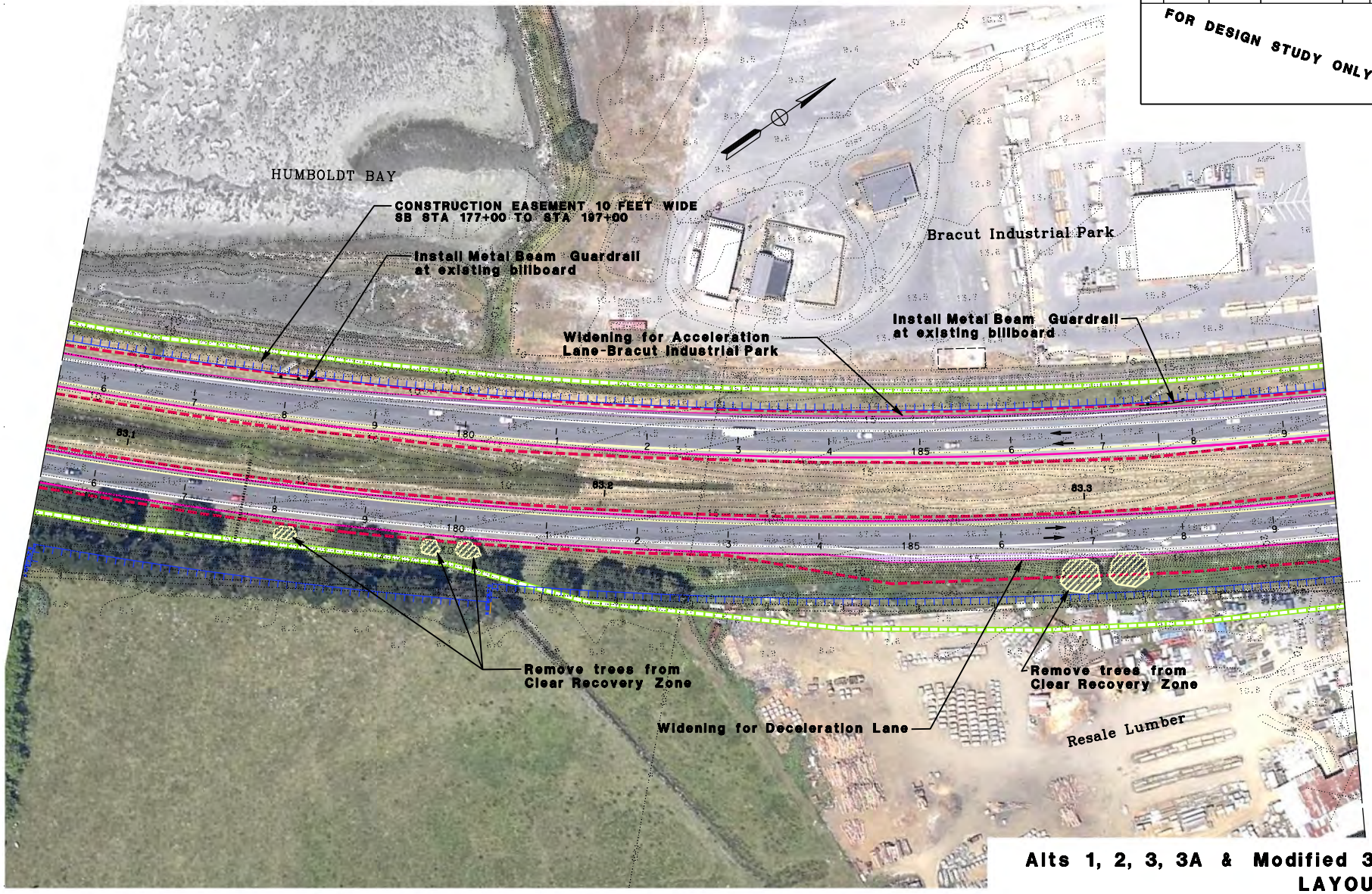
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:25

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea012a1t1.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 2, 3, 3A & Modified 3A
LAYOUT
L-13

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

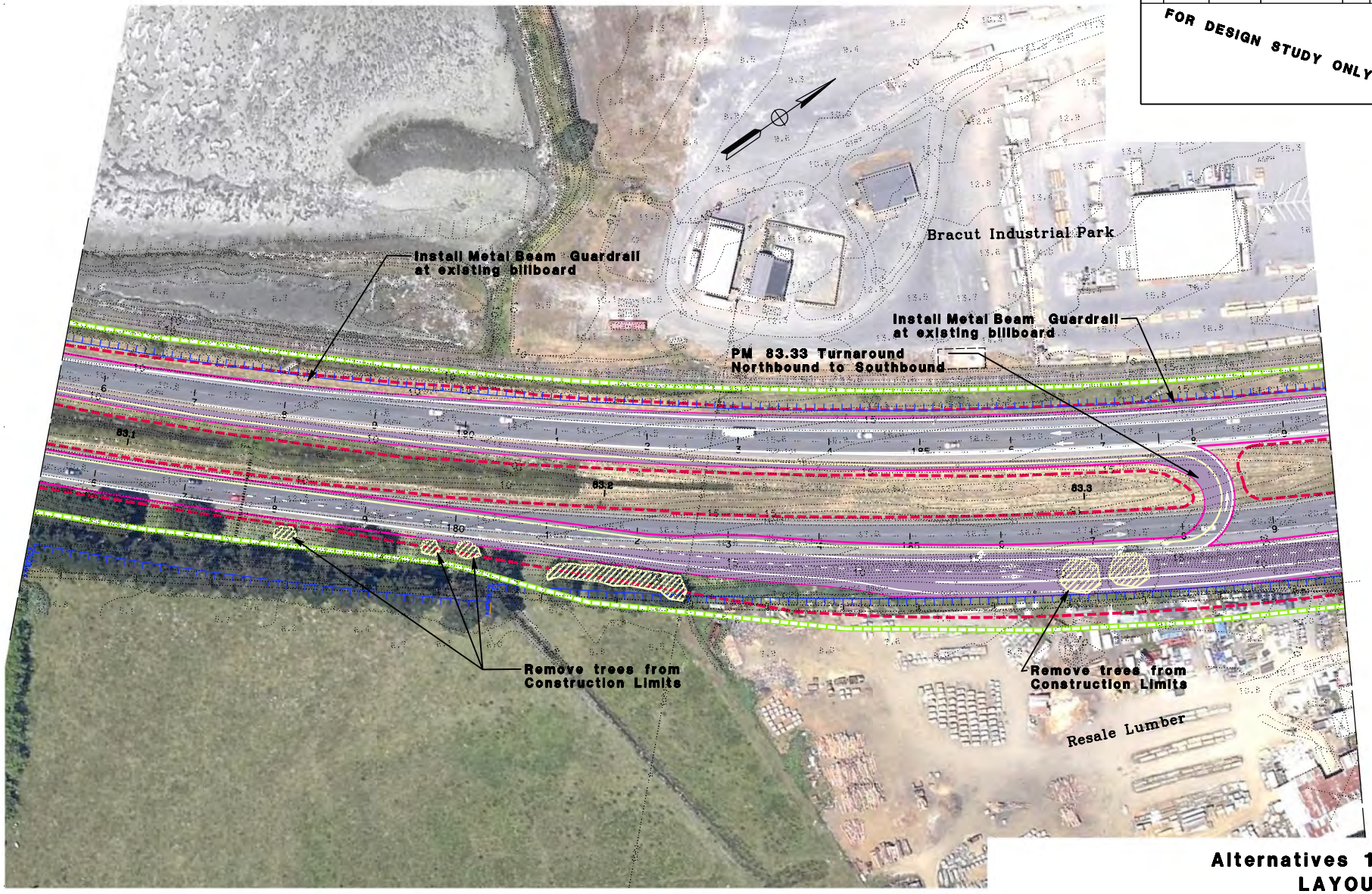
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:25

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea013.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternatives 1A
LAYOUT L-13 (i)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DESIGN

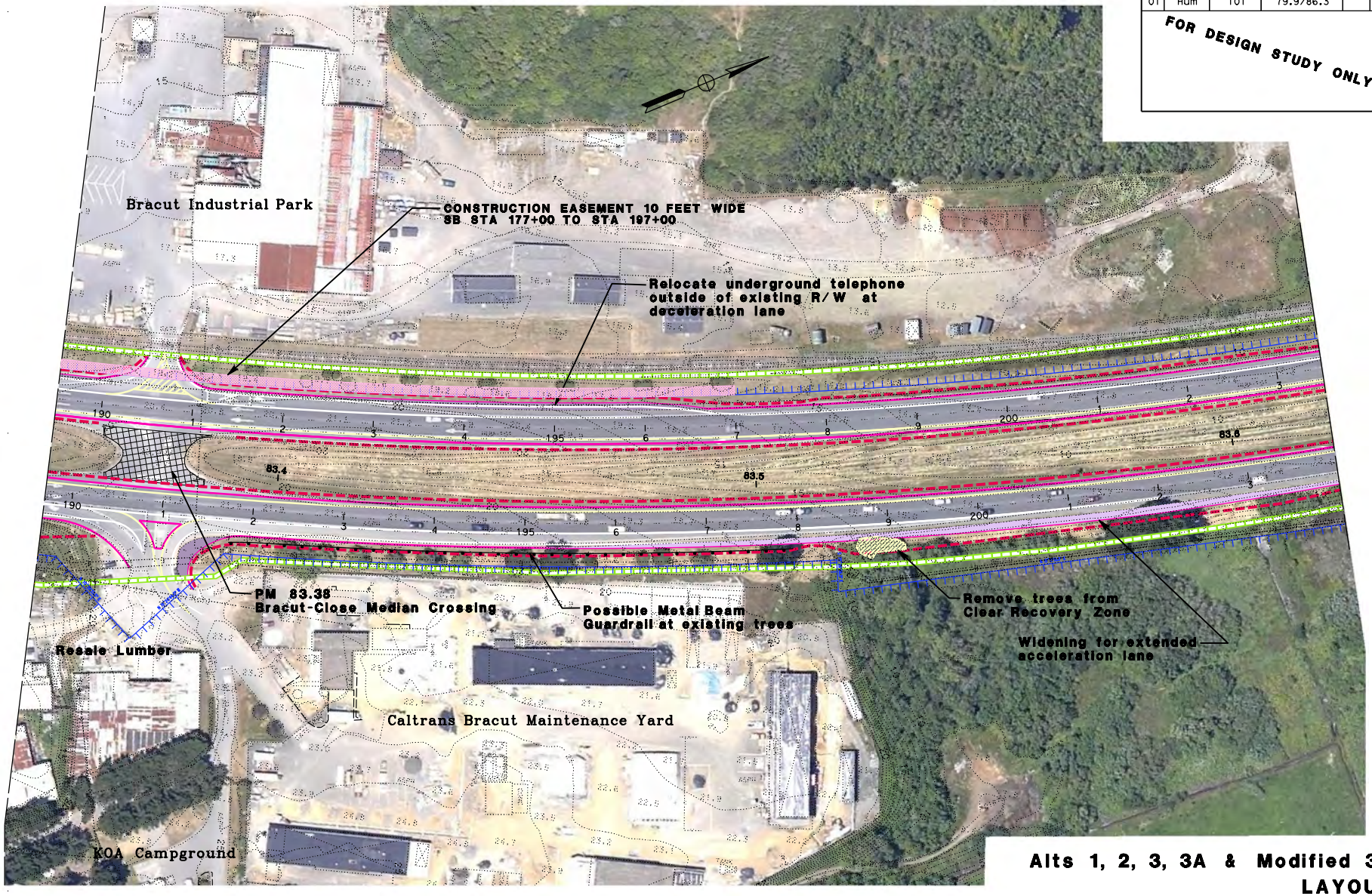
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:25

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea013alt1a.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 2, 3, 3A & Modified 3A

LAYOUT
L-14

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

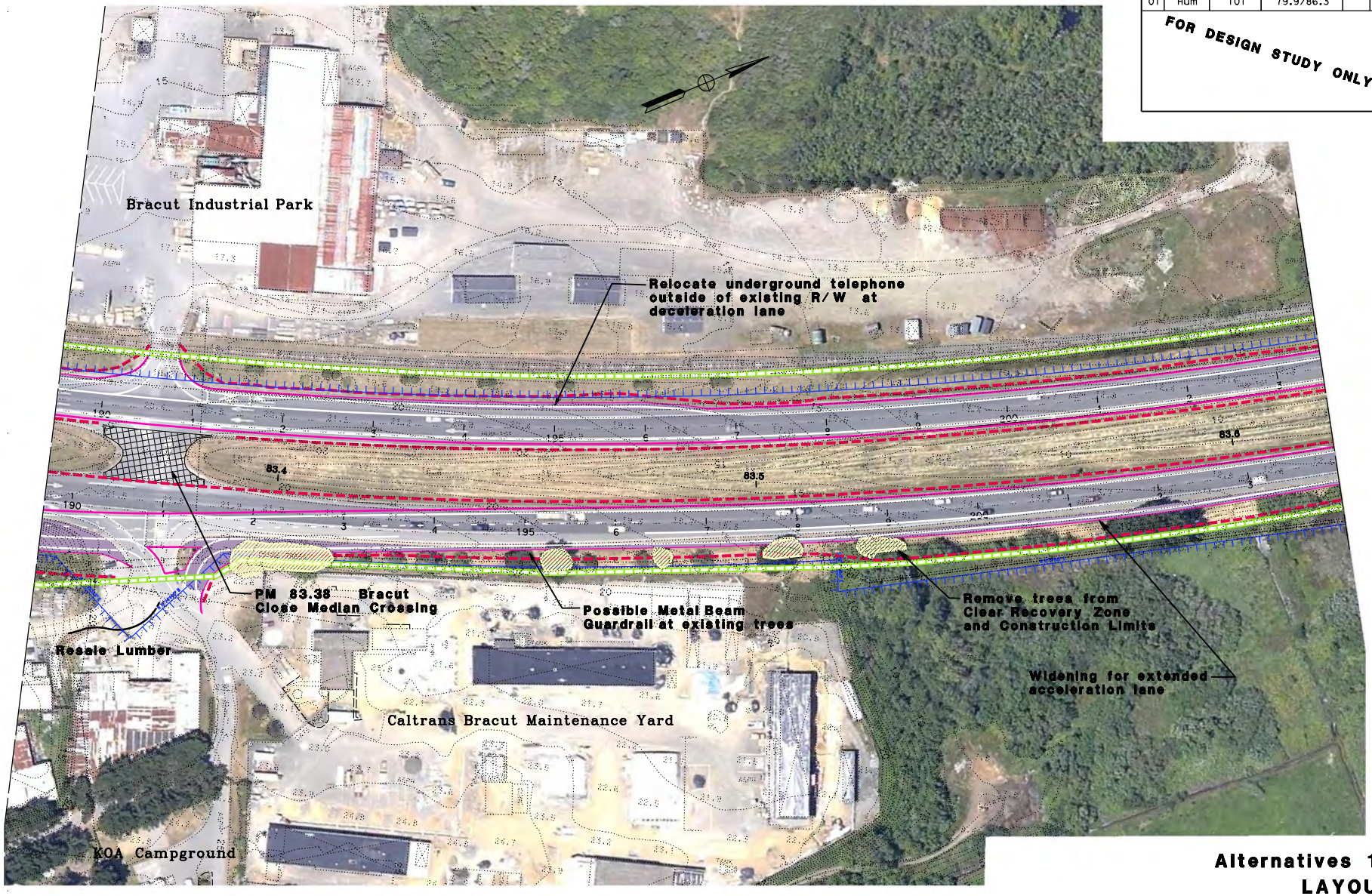
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:25

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea014.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



SCALE: 1"=50'

Alternatives 1A

LAYOUT L-14 (i)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY

CALCULATED-DESIGNED BY: TODD LARK

CHECKED BY

REVISED BY

DATE REVISED

LAST REVISION 08-11-08

DATE PLOTTED => 12-OCT-2012

TIME PLOTTED => 15:25

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s119316

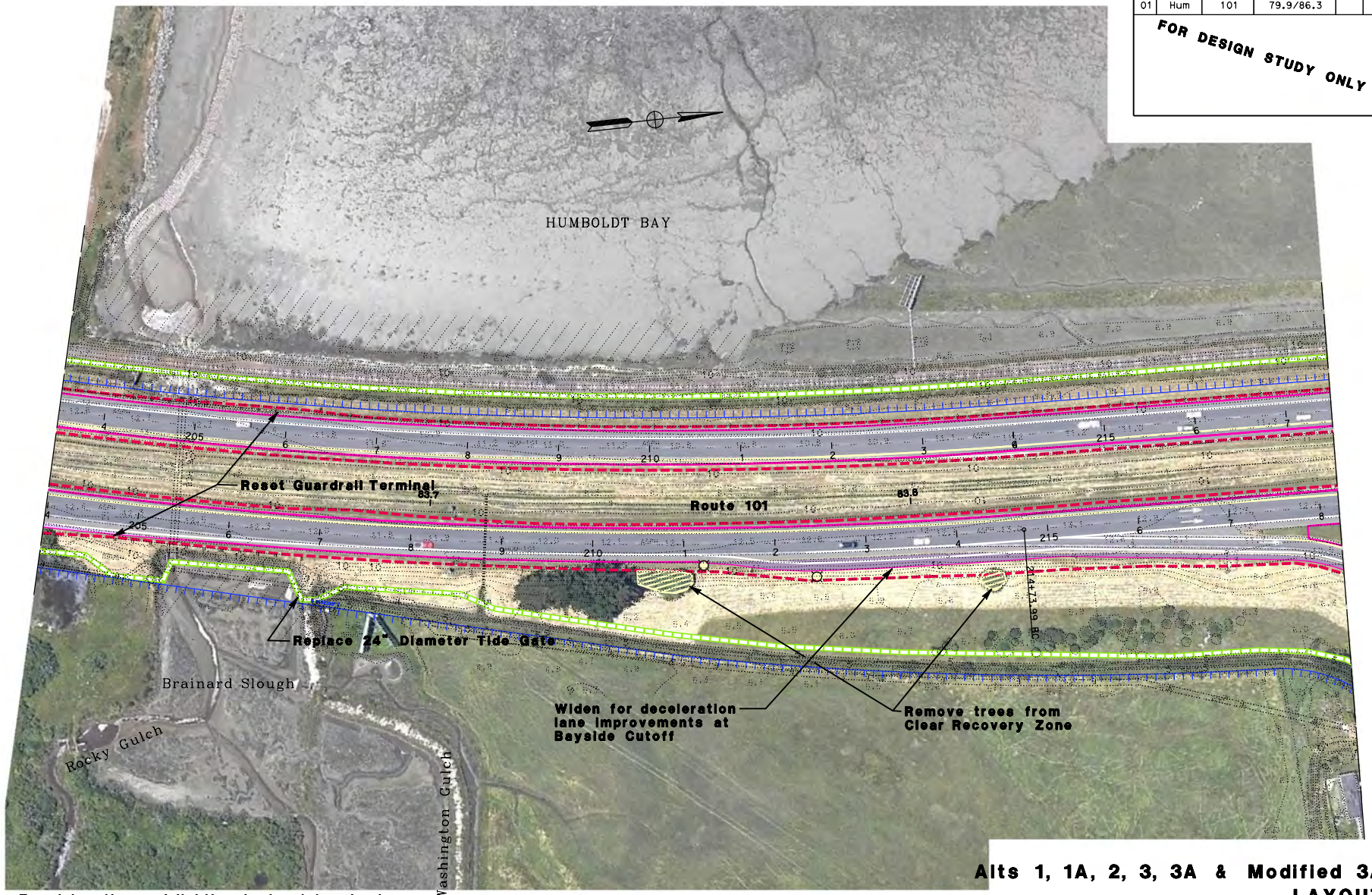
DGN FILE => 136330ea014alt1a.dgn

CU 03232

EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-15

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

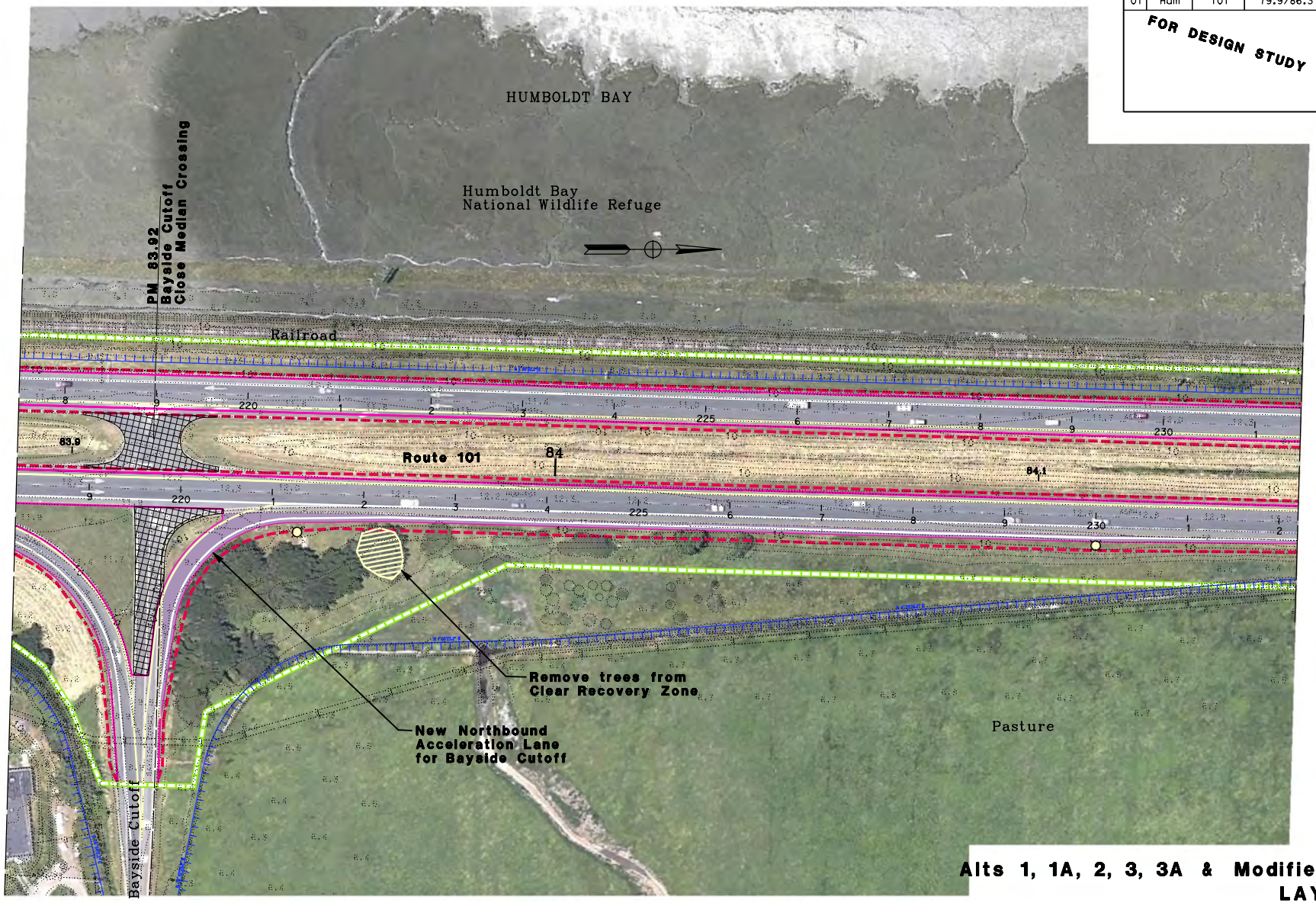
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:52

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea015.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-16

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

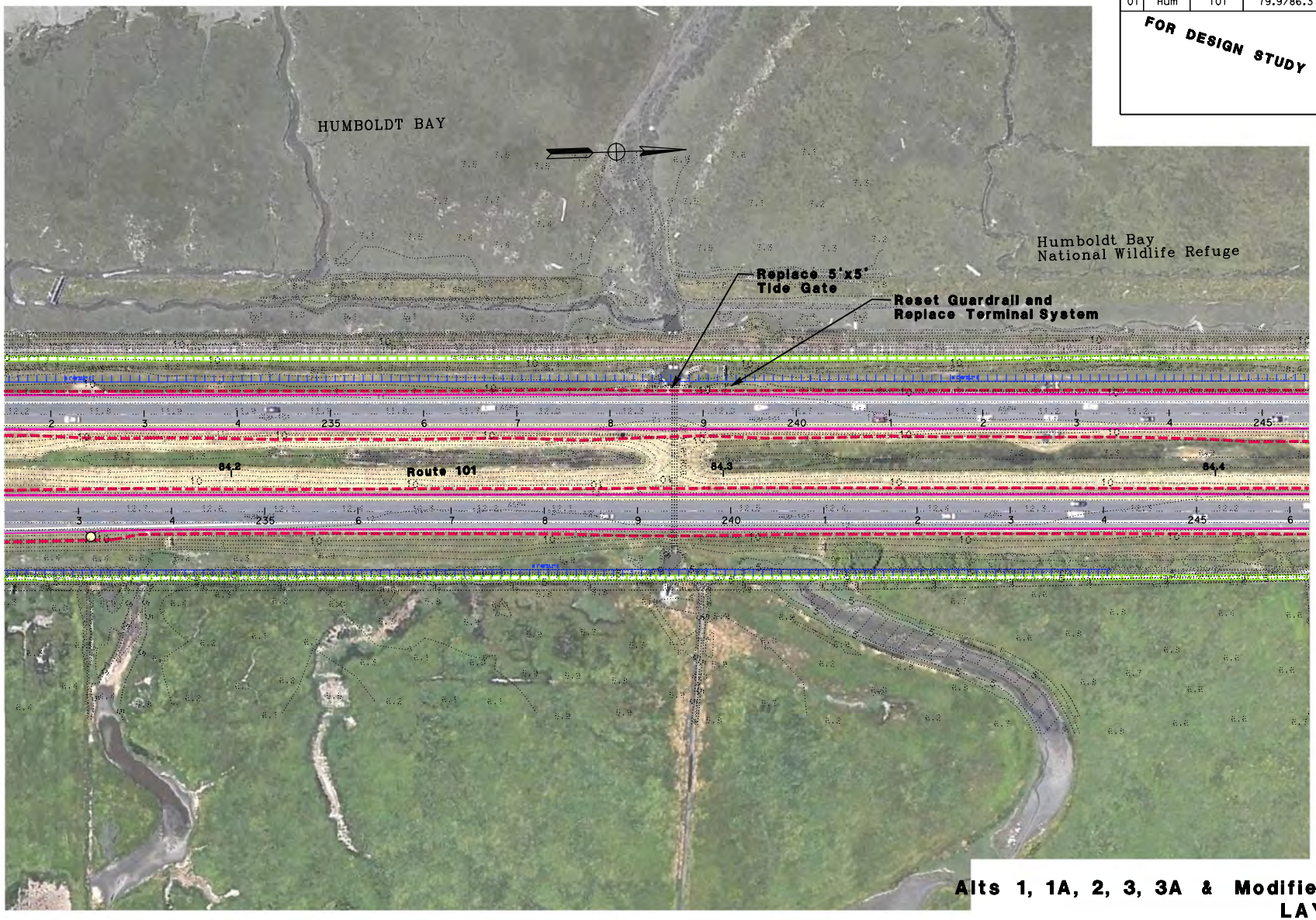
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:52

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea016.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-17

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

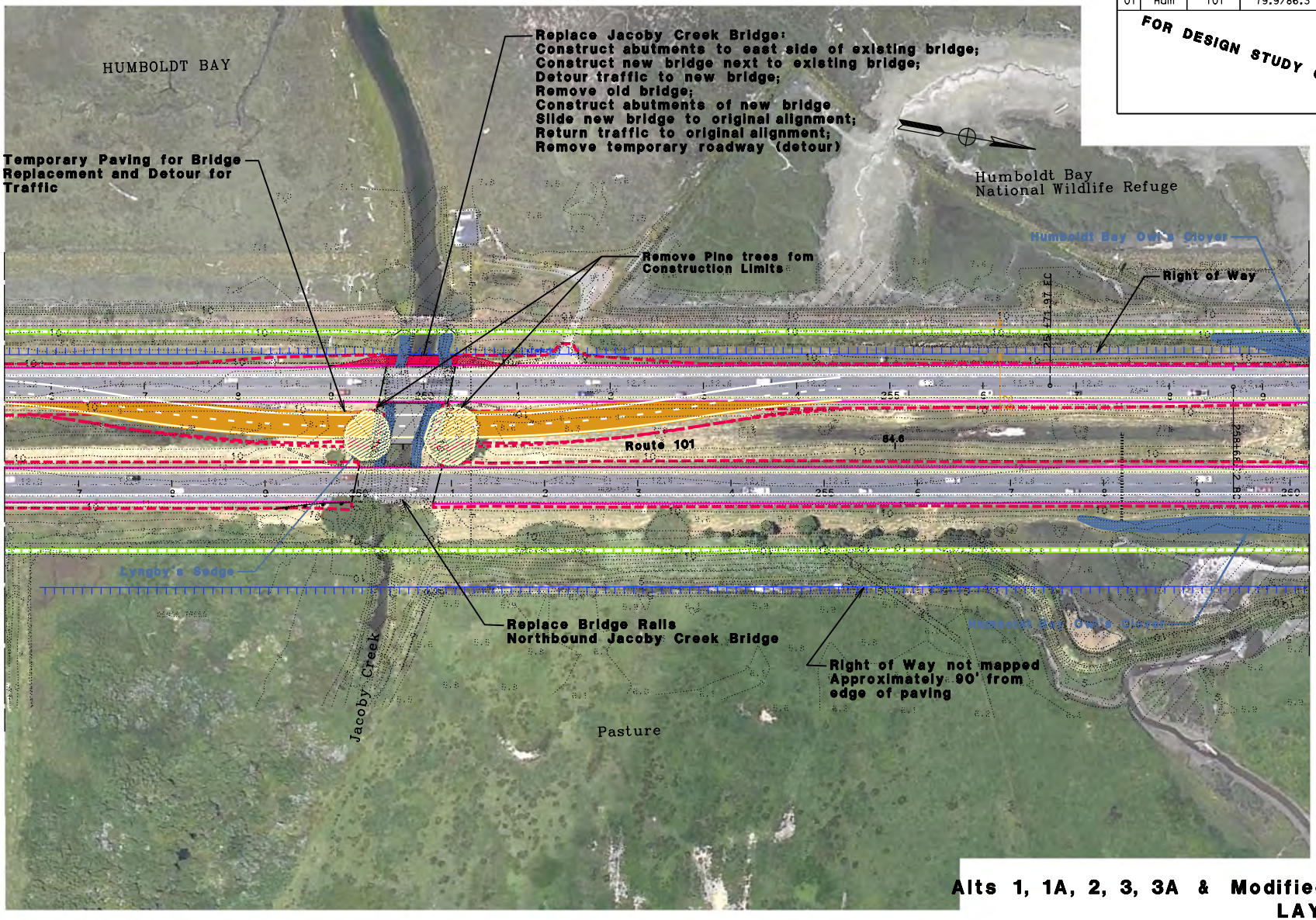
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:52

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea017.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-18

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

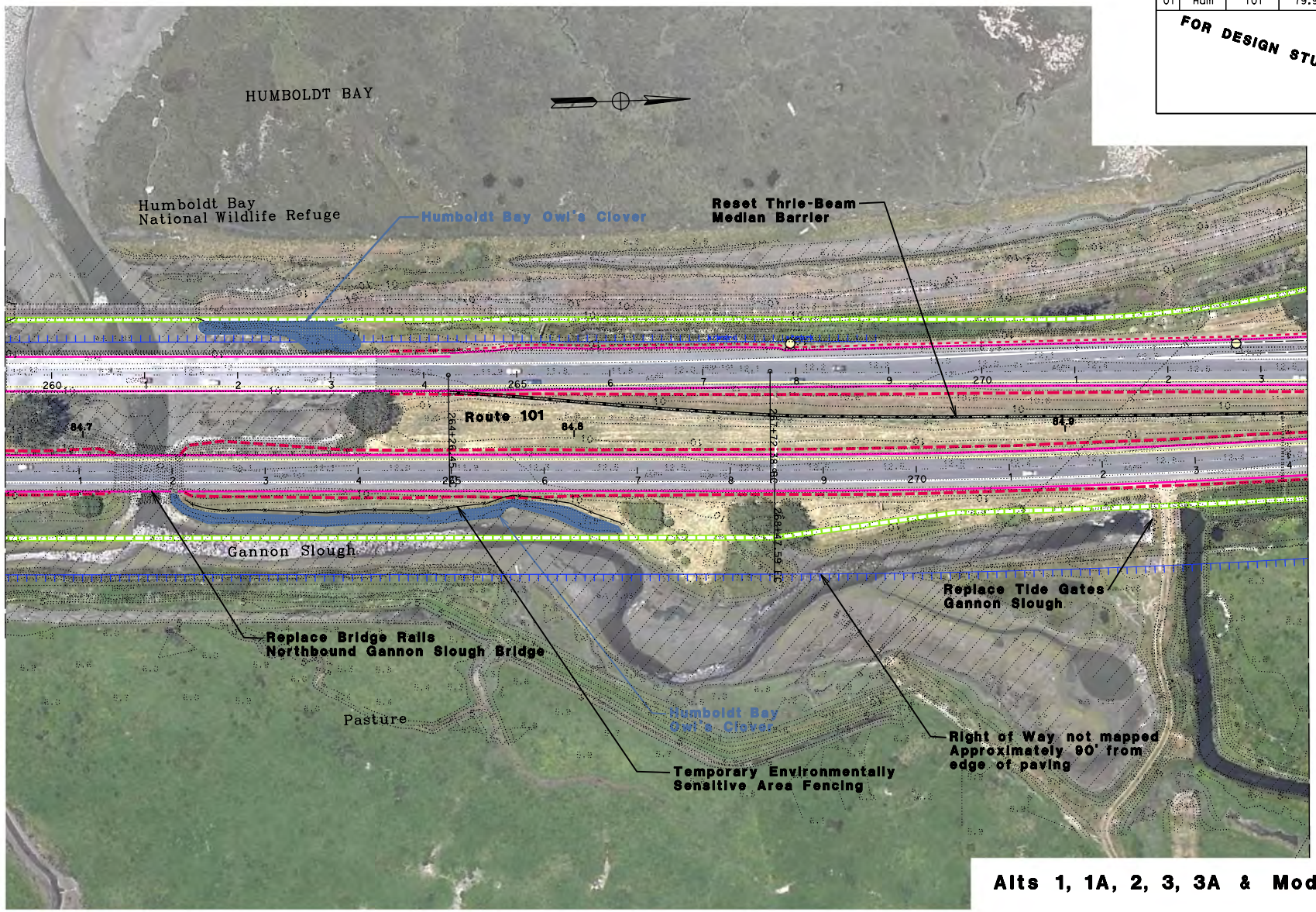
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea018.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2, 3, 3A & Modified 3A

LAYOUT
L-19

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

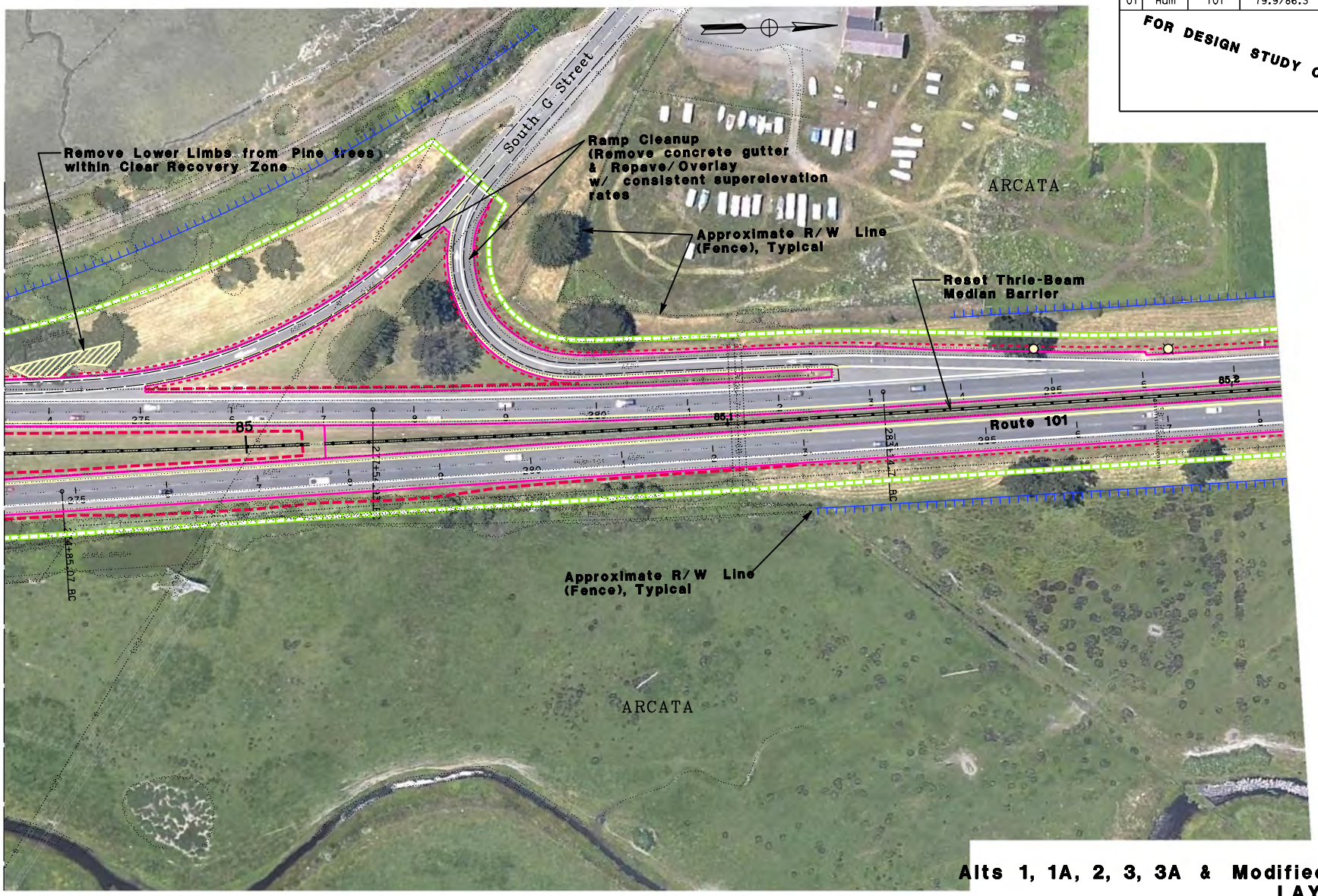
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea019.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-20

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

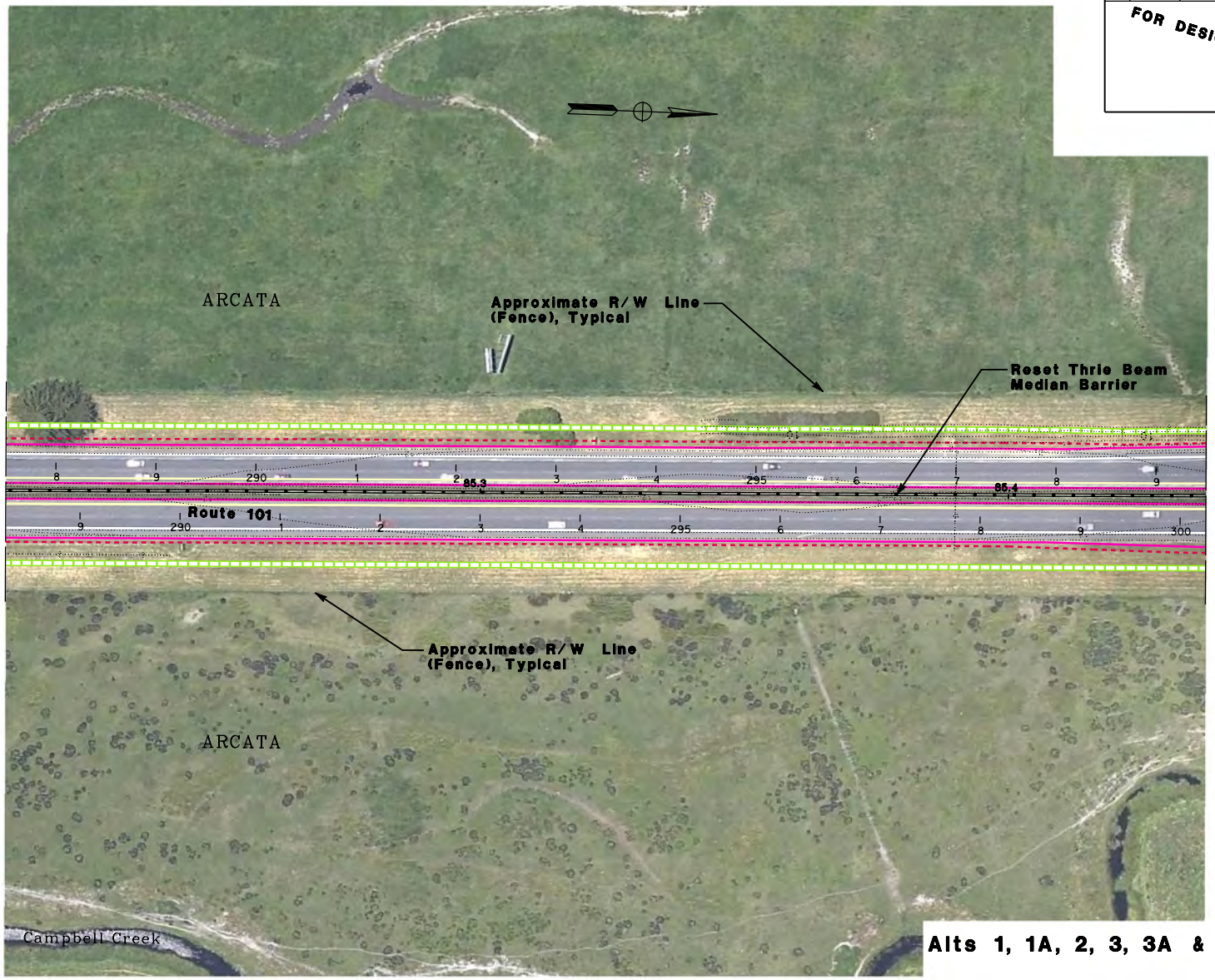
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea020.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-21

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

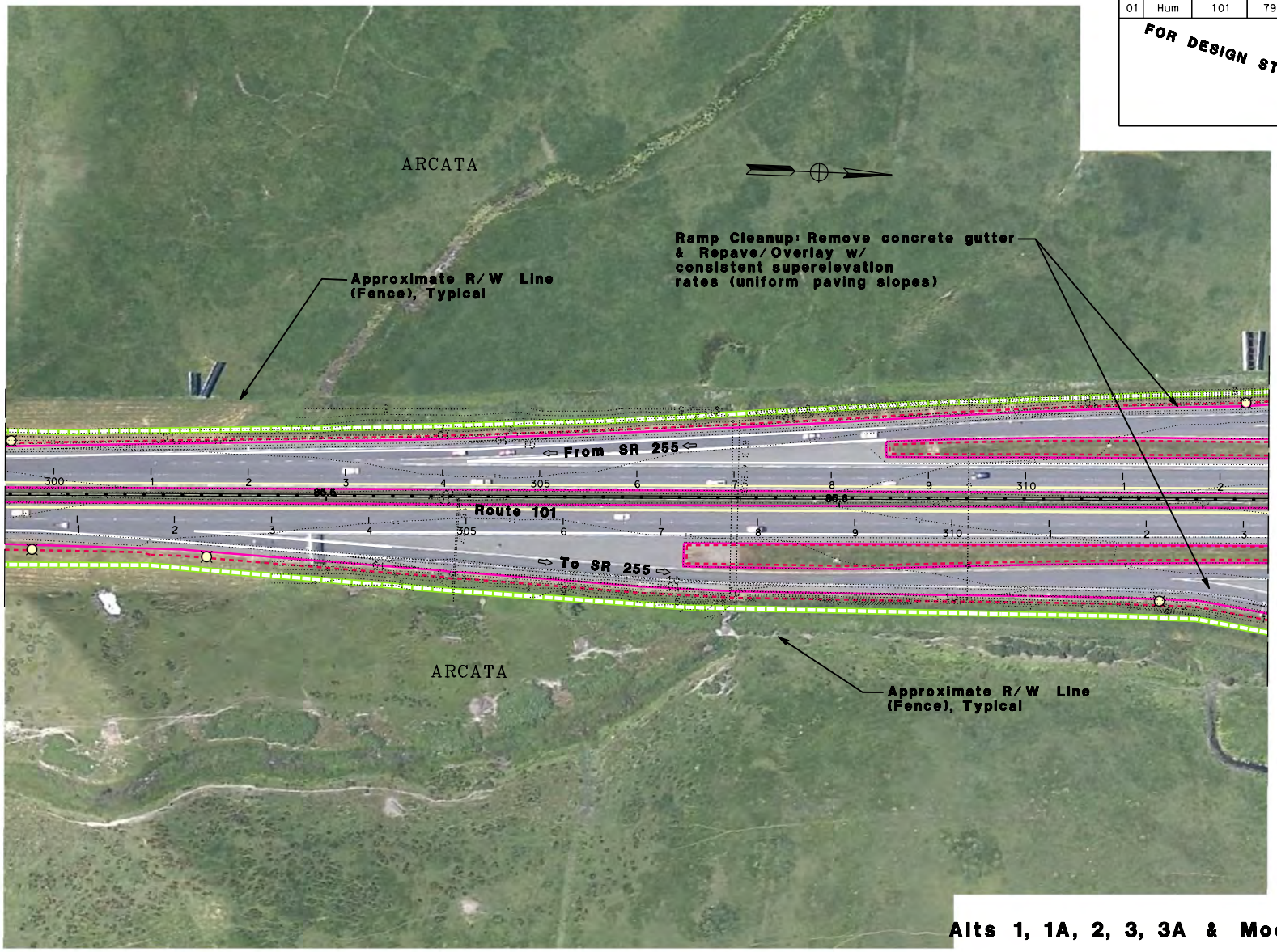
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea021.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2, 3, 3A & Modified 3A

LAYOUT
L-22

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

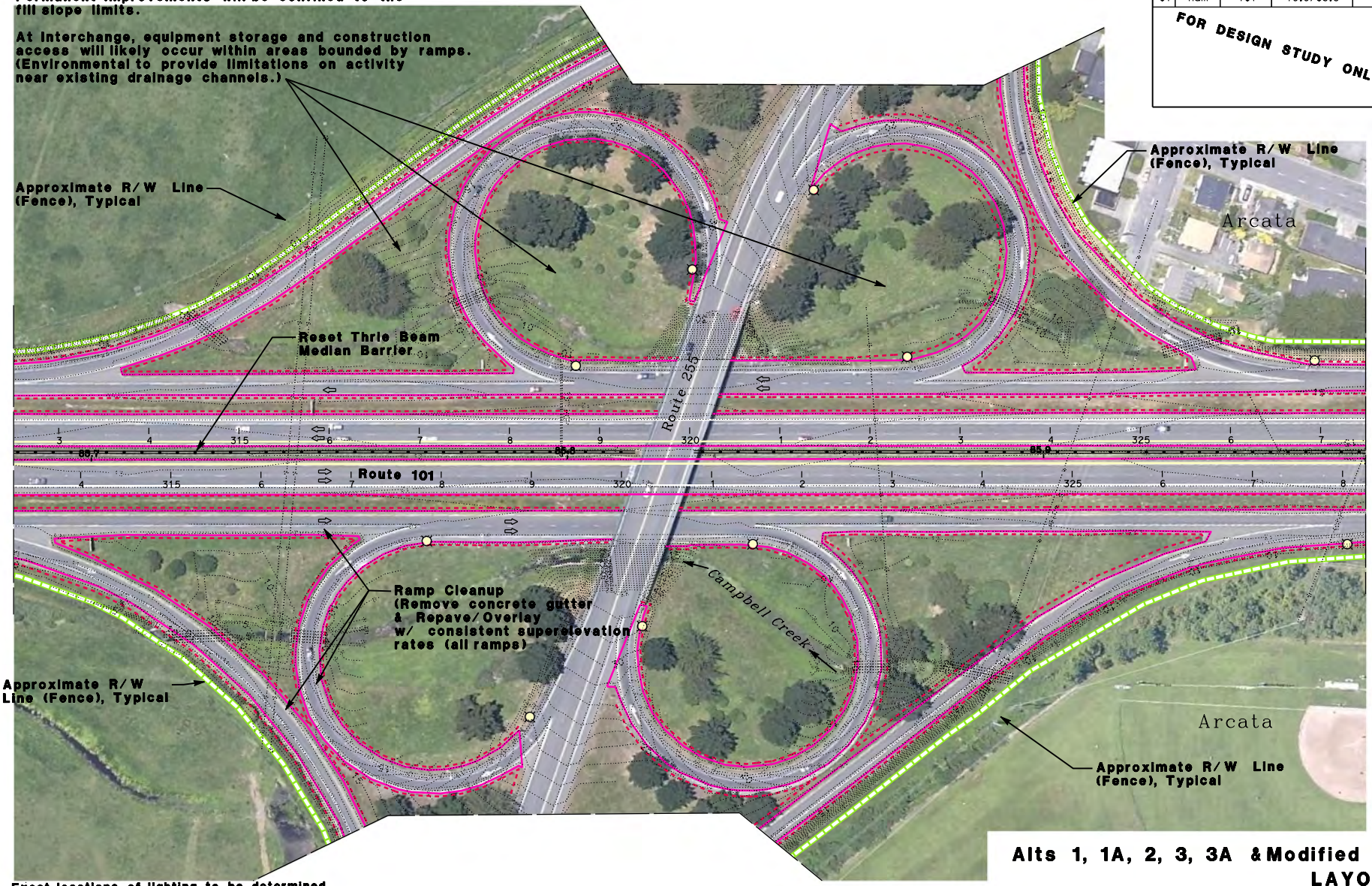
BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea022.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

Note:
Permanent improvements will be confined to the fill slope limits.

At interchange, equipment storage and construction access will likely occur within areas bounded by ramps. (Environmental to provide limitations on activity near existing drainage channels.)



Exact locations of lighting to be determined. Trenching for lighting not shown.

Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-23

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

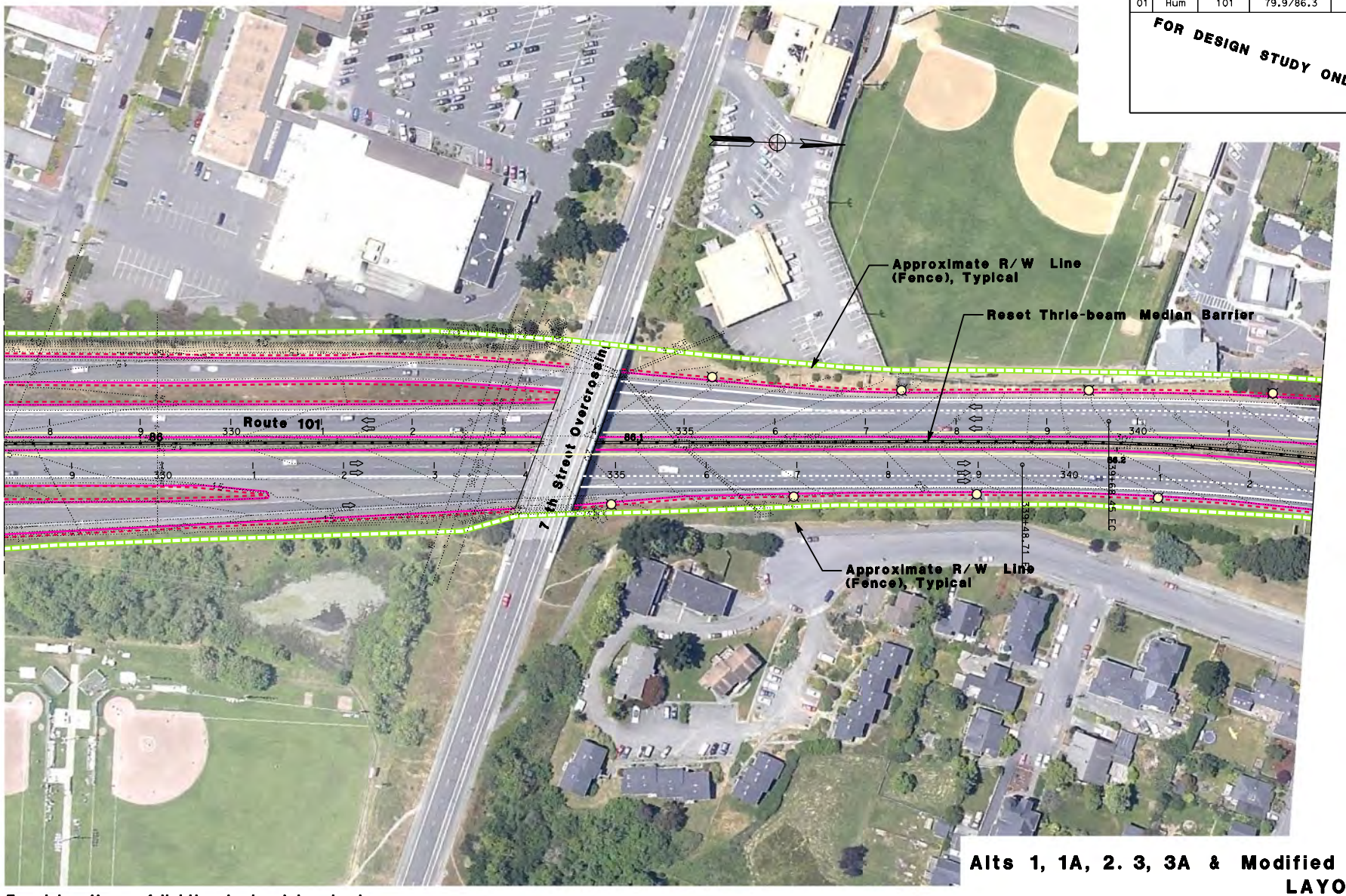
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea023.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2. 3, 3A & Modified 3A
LAYOUT L-24

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea024.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-25

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

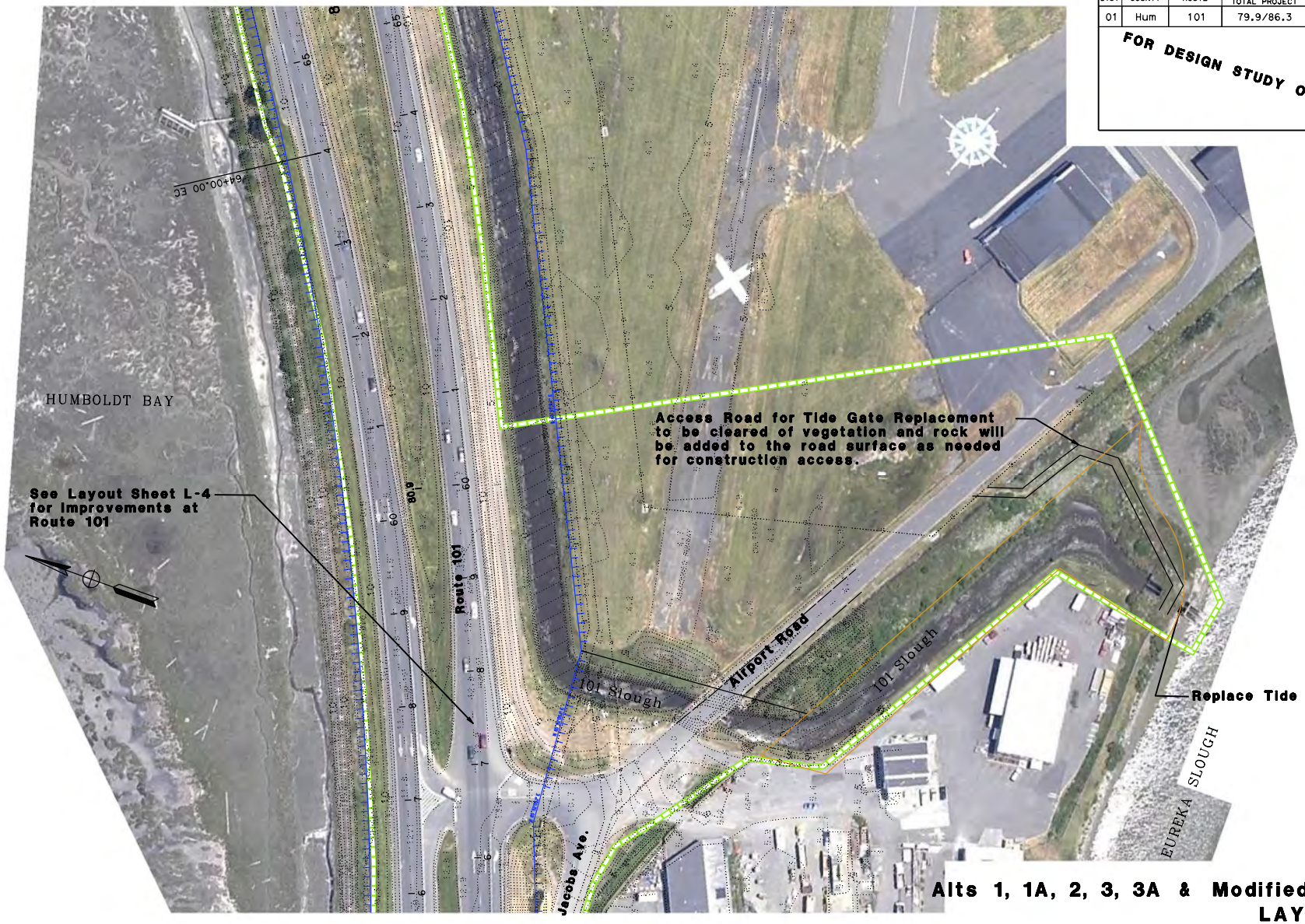
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY
CHECKED BY
TODD LARK
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea025.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-26

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

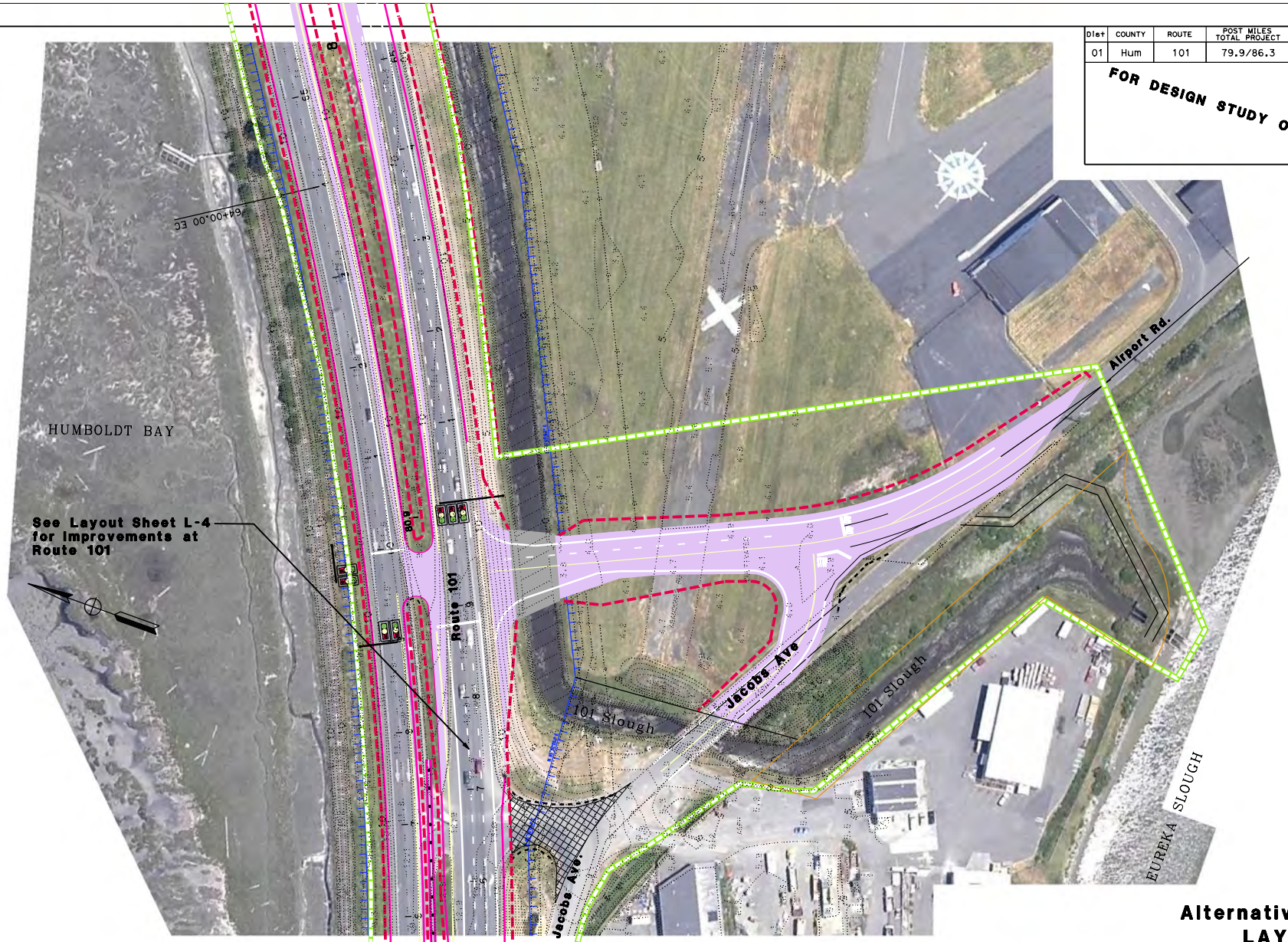
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea026.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alternative 3
LAYOUT
L-27

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY
CHECKED BY
TODD LARK
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea027.dgn
CU 03232
EA 363301

Appendix B Level of Service

LEVELS OF SERVICE

for Two-Way Stop Intersections

Level of Service	Flow Conditions	Delay per Vehicle (seconds)	Technical Descriptions
A		≤10	Very short delays
B		11-15	Short delays
C		16-25	Minimal delays
D		26-35	Minimal delays
E		36-50	Significant delays
F		>50	Considerable delays

Source: 2000 HCM, Exhibit 17-2, Level of Service Criteria for TWSC Intersections

LEVELS OF SERVICE
for Multi-Lane Highways

Level of Service	Flow Conditions	Operating Speed (mph)	Technical Descriptions
A		60	Highest level of service. Traffic flows freely with little or no restrictions on maneuverability. **No delays**
B		60	Traffic flows freely, but drivers have slightly less freedom to maneuver. **No delays**
C		60	Density becomes noticeable with ability to maneuver limited by other vehicles. **Minimal delays**
D		57	Speed and ability to maneuver is severely restricted by increasing density of vehicles. **Minimal delays**
E		55	Unstable traffic flow. Speeds vary greatly and are unpredictable. **Minimal delays**
F		<55	Traffic flow is unstable, with brief periods of movement followed by forced stops. **Significant delays**

Source: 2000 HCM, Exhibit 21-3, Speed-Flow Curves with LOS Criteria for Multi-Lane Highways

Appendix C Title VI Statement

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
P.O. BOX 942873, MS-49
SACRAMENTO, CA 94273-0001
PHONE (916) 654-5266
FAX (916) 654-6608
TTY 711
www.dot.ca.gov

Flex your power!
Be energy efficient!

March 2013

NON-DISCRIMINATION
POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

For information or guidance on how to file a complaint based on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, please visit the following web page: http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

Additionally, if you need this information in an alternate format, such as in Braille or in a language other than English, please contact the California Department of Transportation, Office of Business and Economic Opportunity, 1823 14th Street, MS-79, Sacramento, CA 95811. Telephone: (916) 324-0449, TTY: 711, or via Fax: (916) 324-1949.

MALCOLM DOUGHERTY
Director

"Caltrans improves mobility across California"

❖

Appendix D Section 4(f)

Introduction

This appendix describes resources evaluated relative to the requirements of Section 4(f) Department of Transportation Act of 1966 within the project study area.

Regulatory Setting

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 49 United States Code (USC) 303, declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

Section 4(f) specifies that the Secretary [of Transportation] may approve a transportation program or project . . . requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

there is no prudent and feasible alternative to using that land; and

the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Section 4(f) further requires consultation with the Department of the Interior and, as appropriate, the involved offices of the Department of Agriculture and the Department of Housing and Urban Development in developing transportation projects and programs that use lands protected by Section 4(f). If historic sites are involved, then coordination with the State Historic Preservation Officer (SHPO) is also needed.

Resources Evaluated Relative to the Requirements of Section 4(f)

Section 4(f) parks, recreational facilities, and wildlife and waterfowl refuges

Within a half mile of the project, there are numerous public recreation areas that are protected Section 4(f) resources. Humboldt Bay (includes Arcata Bay) lies to the west of the Route 101 corridor and is adjacent to wetlands, wildlife refuges and sanctuaries, and a (currently unused) railroad line that parallels Route 101. Current recreation activities, such as hunting, are allowed in the Humboldt Bay National Wildlife Refuge on the west side of Route 101 and in the State wildlife area on the east side of Route 101. Hiking opportunities and wildlife observation are popular at the Arcata Marsh and Wildlife Sanctuary at the north end of the corridor. There are also public playing fields on both sides of the Route 101/255 interchange in Arcata. Rotary Park on South G Street is also within a half-mile of the Route 101/255 interchange in Arcata.

None of the project build alternatives would require use of any of these public recreation areas that are protected Section 4(f) resources.

Section 4(f) archaeological and historic sites

Within the Section 106 area of potential effects (APE), there are two protected Section 4(f) resources (historic sites).

1. A portion of the Batini Dump (a refuse dump dating back to the 1930s). All Build Alternatives would avoid the NRHP eligible portion of the Batini Dump.

2. A portion of Murray Field Airport has been determined for the purposes of this project to meet National Register of Historic Places (NHRP) criterion C, at the local level of significance, for the architecture of the original 1930s hangar that is central to the airport and its history. This structure also retains a high degree of integrity. The boundaries of this historic property extend to the immediate tarmac surrounding the hangar, but not to the extent of the entire property as runway configurations have changed dramatically over time and newer structures have been added to other areas of the airport.

Airport Road currently provides access from the airport to Route 101. Alternative 3 would require realigning Airport Road resulting in approximately 1.25 acres of the non-NRHP eligible portion of the airfield would be used for the realigned road. Airport Road and the Airport are owned by the County of Humboldt. (See Figures D-1 and D-2.) Alternative 3 would require an encroachment permit from the County of Humboldt to realign Airport Road within the Murray Field Airport complex. The State Office of Historic Preservation finding concurred with the Finding of No Adverse Effect in terms of the project's overall effects to cultural resources. Consequently, the construction of Alternative 3 would not result in a use of this Section 4(f) historic resource.

Overall, none of the build alternatives would require the use of the two Section 4(f) protected historic resources.

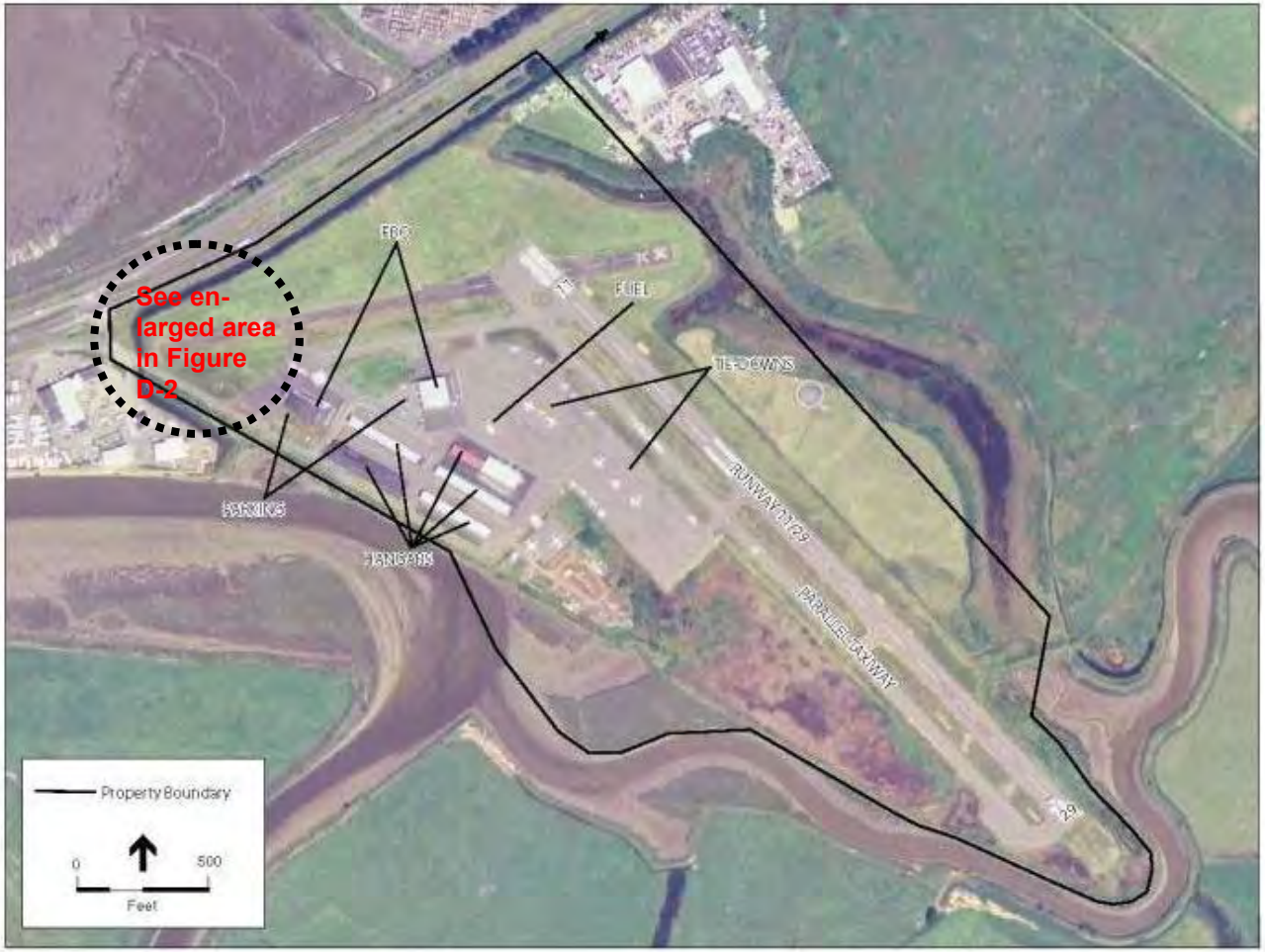


Figure D-1
Murray Field Airport Existing Facilities

Source: Murray Field Master Plan Update Initial Study April 2008

❖

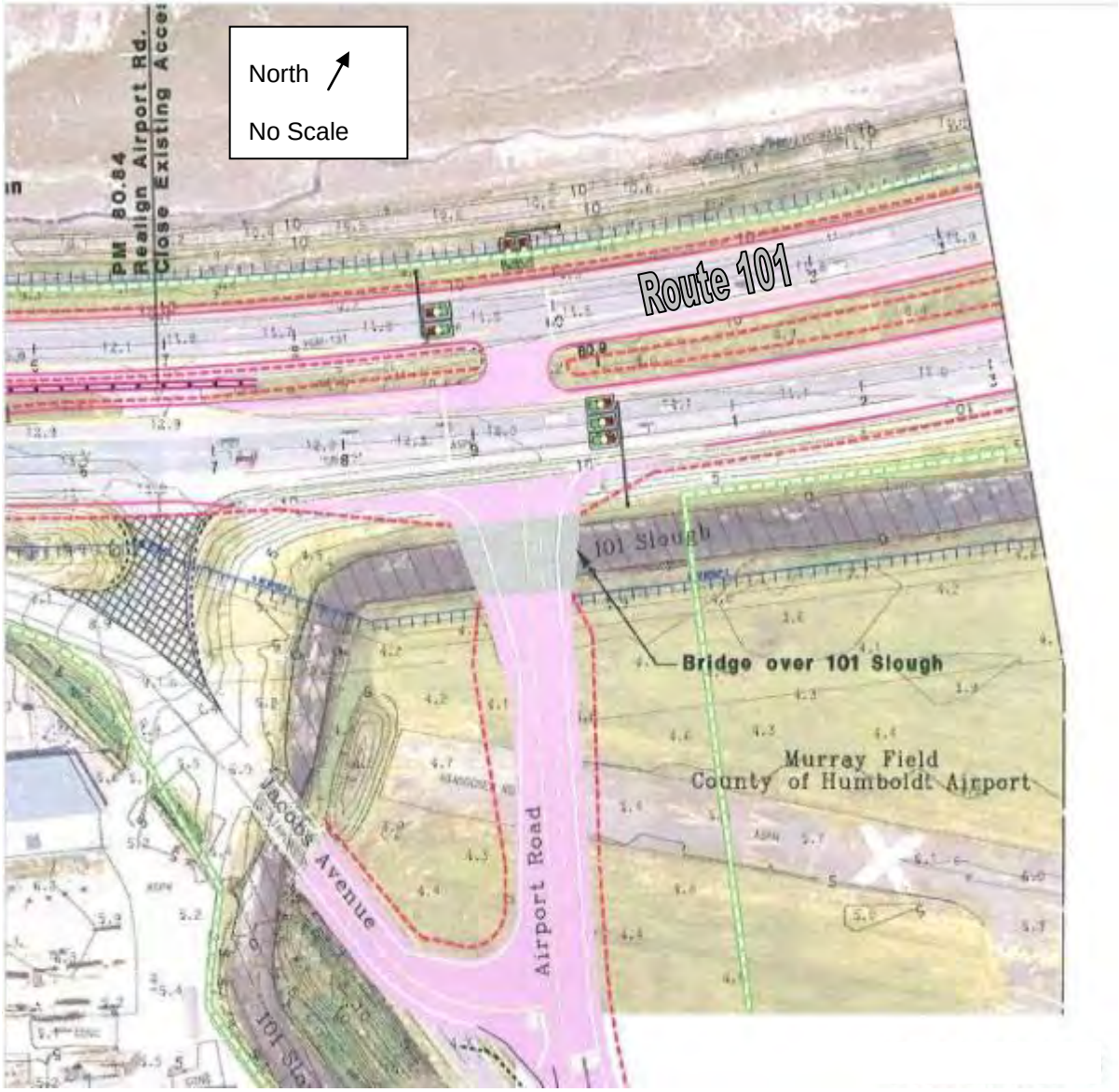


Figure D-2 Layout Plan of Alternative 3 Route 101/Airport Road Intersection Design

The pink shaded area below and to the right of the 101 Slough would be constructed within the airport property

❖

Appendix E NEPA/404 Integration Process

❖

In May 1992, the Federal Highway Administration (FHWA), the U.S. Army Corps of Engineers (USACE), and the U.S. Environmental Protection Agency (EPA) adopted an agency policy to improve interagency coordination and to integrate National Environmental Policy Act (NEPA) and Clean Water Act Section 404 procedures. A Memorandum of Understanding (MOU) was developed for Arizona, California, and Nevada that specifies how these states will implement the agency policy. The Western States MOU applies to all projects needing both Federal Highway Administration (FHWA)/Federal Transit Administration (FTA) action under NEPA and a U.S. Army Corps of Engineers (USACE) individual permit under Section 404 of the Clean Water Act. An updated MOU applicable only to California was approved in April 2006.

Under the MOU process, U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration NOAA Fisheries, Federal transit Administration (FTA), USACE and EPA are asked to concur on the project Need and Purpose statement and criteria for selecting and evaluating alternatives. USACE also verifies the delineation of jurisdictional wetlands. The MOU process also incorporates analysis of the project pursuant to 404(b)(1) of the Clean Water Act. Prior to release of the Final Environmental Impact Report/Statement (FEIR/S), USACE, EPA and USFWS are asked to provide preliminary agreement on conceptual mitigation for unavoidable impacts to special aquatic sites. USACE and EPA are also asked to provide preliminary agreement on the Least Environmentally Damaging Practicable Alternative (LEDPA) pursuant to the Clean Water Act.

The goal of the MOU is to have regulatory agencies participate in the project early in its planning and to have decisions made once for each stage of the process in order to expedite matters. Regulatory agencies are to provide comments in a timely manner and are to provide written concurrence that information to date is adequate for a particular stage and that the project may proceed to the next stage. Agencies do not revisit previous concurrences unless there is significant new information or a significant change to the project, the environment, or laws and regulations. Agencies agree to attempt to resolve issues causing non-concurrence and to try to do so informally before entering formal dispute resolution.

Preliminary studies indicated the Eureka-Arcata Corridor Improvement Project would require permanently filling several acres of USACE jurisdictional wetland. Consequently, consultation was initiated for the Eureka-Arcata corridor Improvement project with the USACE, EPA, USFWS, and NOAA Fisheries in accordance with the California NEPA-404 MOU. A project overview and a preliminary project Need and Purpose Statement were presented to the federal agencies at the January 15, 2002 NEPA/404 Kick-off Meeting. Comments on the Need and Purpose Statement were received, and the statement was revised accordingly. A second Integration meeting was held on March 16, 2006. At this meeting, a revised Need and Purpose Statement, Selection Criteria, and revised Range of Alternatives were presented and discussed a to gain a greater understanding of the agencies' comments.

In June 2009, Caltrans selected (unmodified) Alternative 3A as the preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) and Preferred Alternative and met with the public resource agencies that would issue permits for this project.

A 404(b)(1) alternatives analysis was prepared by Caltrans staff to document the LEDPA. The U.S. Clean Water Act 404(b)(1) Guidelines require that the practicable alternative that would involve the least adverse impact to aquatic resources (e.g. wetlands) be chosen unless this alternative would have other significant environmental consequences (40 CFR § 230.10(a)). Thus, this regulation allows the potential for other significant environmental impacts to override protection of aquatic resources. In some cases the only practicable alternatives that are available would fill aquatic resources. Thus, it may be necessary to accept impacts to aquatic resources in order to avoid or minimize impacts on other resources.

The 404(b)(1) alternatives analysis emphasized Section 404 concerns when evaluating alternatives. However, the process also takes into consideration specific project and community circumstances, and the magnitude of the impacts. The alternative that would result in the least overall environmental harm as determined through discussions with regulatory and resource agencies needs to be selected. An important distinction to keep in mind when evaluating harm to non-aquatic resources versus harm to waters of the U.S., is that, for the former, the alternatives selection process evaluates reasonable and prudent alternatives based on the "net harm" (after mitigation) of the alternative to other environmental resources. In contrast, for almost all section 404 alternatives analyses, the evaluation of practicable alternatives must consider the impact to aquatic resources that would result from the alternative before compensatory mitigation: in other words, compensatory mitigation may not be used as a method to reduce environmental impacts in the evaluation of the least environmentally damaging practicable alternative. Therefore, if an alternative exists where the impacts to non-aquatic resources can be practicably mitigated, this alternative should generally be selected over one that would impact aquatic resources.

At the request of the Humboldt County Association of Governments (HCAOG) and Jacobs Avenue residents and businesses, Caltrans began to consider modifications to Alternative 3A to improve Route 101 access from Jacobs Avenue and Airport Road. In June 2010, Caltrans modified the turn movements allowed at the Airport Road signal in the original Alternative 3A to allow southbound turn movements from Airport Road, referred to as a half signal. For purposes of clarity, the original Alternative 3A was dropped and the modified alternative is now referred to as Modified Alternative 3A. Modified Alternative 3A is currently the proposed LEDPA and Preferred Alternative that meets the project need and purpose of safety improvement (and other long-term highway improvements) that would benefit all travel modes, while minimizing traffic access, visual, and wetland impacts.

NEPA-404 Conclusion

USFWS, EPA, and USACE have formally concurred with the LEDPA and the conceptual mitigation plan. NOAA Fisheries did not submit formal comments regarding the LEDPA and the conceptual mitigation plan. The NEPA-404 process is complete as a requirement for the Final EIR/S. Table E in this appendix summarizes the NEPA-404 correspondence. Copies of all correspondence as well as the 404(b)(1) analysis are available for review; please call or email Rosalind Litzky at 707-445-5222.

The next action under the NEPA/404 Integration MOU consists of applying for the Section 404 Individual Permit by the USACE.

Table E List of NEPA/404 Correspondence Letters

Date	From	To	Subject
5-9-02	NOAA - Fisheries	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
6-10-02	Caltrans	NEPA/404 Participants	Request concurrence on Need and Purpose Statement; range of alternatives; selection criteria
7-8-02	U.S. EPA	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
7-29-02	U.S. FWS	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
9-16-02	US ACE	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
4-14-06	Caltrans	NEPA/404 Participants	Request concurrence on revised Need and Purpose; Range of alternatives; Selection criteria
6-12-06	NOAA - Fisheries	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
6-19-06	U.S. EPA	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria

8-11-06	U.S. FWS	Caltrans	Concurrence on Need and Purpose Statement; range of alternatives; selection criteria
1-15-08	Caltrans	FHWA	Submitted checkpoint 2 closure letter documenting that the NEPA/404 agencies concurred on the range of alternatives and criteria for alternatives selection.
7-3-09	Caltrans	NEPA/404 Participants	Submitted 404(b)(1) Alternatives Analysis and request for concurrence on Least Environmentally Damaging Practicable Alternative (LEDPA) and Conceptual Mitigation Plan (CMP)
7-22-09	U.S. EPA	Caltrans	Received LEDPA and CMP concurrence
8-19-09	NOAA	Caltrans	Placed a voice mail stating NOAA would not formally comment on the LEDPA and CMP
8-25-09	Caltrans	USACE	Submitted second request for concurrence on LEDPA (Modified Alternative 3A) and Conceptual Mitigation Plan (CMP).
8-28-09	Caltrans	NOAA Fisheries	Request for CMP and LEDPA concurrence
9-17-09	USACE	Caltrans	Request for Section 404 Individual Permit Application and wetland delineation verification
10-15-09	CA Dept. of Fish & Wildlife (not a NEPA-404 Signatory Agency)	Caltrans	Comments on LEDPA and CMP
11-5-09	Caltrans	USACE	Submitted completed Section 404 Individual Permit Application and wetland delineation verification request for proposed off-site mitigation sites
11-10-09	CA Dept. of Fish & Wildlife (not a NEPA-404 signatory agency)	Caltrans	Submitted comments regarding the draft prospectus for the mitigation bank

5-19-10	Caltrans	NEPA/404 Participants	Submitted Modified Alternative 3A as the proposed LEDPA and revised CMP
6-23-10	U.S. EPA		Concurrence on LEDPA and CMP
7-27-10	Caltrans	NOAA - Fisheries	Email confirming conversation that NOAA Fisheries has “no comment” on LEDPA and CMP (A no comment from NOAA would still allow Caltrans to proceed.)
8-5-10	U.S. FWS	Caltrans	Concurrence on LEDPA and CMP
10-20-10	USACE	Caltrans	Received letter requesting additional CMP information
11-4-10	Caltrans	USACE	Sent revised concurrence request and clarification of USACE 10-20-10 letter
2-15-11	USACE	Caltrans	Requesting additional wetland banking information
3-2-11	USACE	Caltrans	Received LEDPA concurrence
4-22-11	Caltrans	NEPA/404 Participants	Submitted revised conceptual mitigation plan
7-22-11	USACE	Caltrans	Received concurrence on preliminary conceptual mitigation plan

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET, 16th Floor
SAN FRANCISCO, CALIFORNIA 94103-1398

REPLY TO
ATTENTION OF

Regulatory Division

MAR 2 - 2011

SUBJECT: File No. 296590N

Mr. Gary Berrigan, Senior Environmental Planner
California Department of Transportation (Caltrans)
District 1, P.O. Box 3700
Eureka, California 95502-3700

Dear Mr. Berrigan:

This letter serves to respond to your letter dated November 4, 2010, requesting our agency's written concurrence or nonoccurrence on the proposed U.S. Route 101 Eureka-Arcata Corridor Improvement Project (Modified Alternative 3A), proposed Least Environmentally Damaging Practicable Alternative (LEDPA) determination and Conceptual Mitigation Plan (CMP). Furthermore, you reference the National Environmental Policy Act/Clean Water Act Section 404 Integration Memorandum for Understanding (NEPA/404 MOU) of April 2006, regarding our required response time and conflict resolution process.

We appreciate the opportunity to provide input to this project. On September 16, 2009, we requested a completed permit application from your agency for this project and your submittal of the proposed jurisdictional determination (JD) for the mitigation sites proposed in the CMP. As indicated previously, we were unable to process your request for concurrence/nonconcurrence until submittal of this information from your office. Furthermore, your submittal of your JD for our verification resulted in our determination of the amounts of wetlands and uplands on the proposed wetland mitigation sites. We have received and processed this information and can proceed with our concurrence on your proposed LEDPA. Additionally, we have reviewed the enclosed letter from the Environmental Protection Agency (dated June 23, 2010) and had a telephone conference with their staff regarding this matter.

We have reviewed the recent (May 2010) addendum modifying the previously proposed LEDPA. The modifications resulted in a 0.5 acre increase in impacts to wetlands we regulate. Furthermore, the total acreage of impacts would increase to 8.2 acres. Modifications were also proposed for the Gannon Slough tidal gate resulting in discussions with U.S. Fish and Wildlife Service staff to address the issues. Although these issues arose and wetland impacts were greater, the Modified Alternative 3A appears to meet the LEDPA criteria as it addresses project purpose and need while minimizing overall environmental harm. Therefore, we preliminarily concur that the proposed Modified Alternative 3A, best meets the LEDPA criteria of those alternatives considered for this project. We do reserve the right to reconsider or revisit our

concurrence with this LEDPA if new issues are raised in the future or the LEDPA is modified in any way.

However, as discussed in our letters to you dated October 20, 2010, and February 15, 2011, we need additional information on the proposed mitigation plan/bank. Thus, it is premature at this time for us to concur with your revised Conceptual Mitigation Plan.

Finally, we encourage your agency to coordinate with the California Coastal Commission (CCC) to resolve the issues they have raised and to address their proposed alternative modifications. We agree that some of their concerns and proposals have merit and want to remind you that our permit is contingent on your receiving coastal zone consistency concurrence from the CCC.

You may refer any questions on this matter to Carol Heidsiek of our Regulatory Division by telephone at 707-443-0855. All correspondence should be addressed to the Regulatory Division, USACE, Eureka Field Office, 601 Startare Drive, Box 14, Eureka, California 95501 referencing the File Number at the head of this letter. Again, we appreciate the opportunity to work with your staff on this project and look forward to hearing from you soon.

Sincerely,

Jane M. Hicks

Jane M. Hicks
Chief, Regulatory Division

Enclosure:

EPA Letter Dated June 23, 2010

Copies Furnished (without enclosure):

FHWA, Attn: Lanh Phan
US EPA, Attn: Carolyn Mulvihill
Caltrans, Attn: Cindy Anderson
CCC, Attn: Melanie Faust

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET, 16th Floor
SAN FRANCISCO, CALIFORNIA 94103-1398

REPLY TO
ATTENTION OF

JUL 22 2011

Regulatory Division

SUBJECT: File No. 296590N

Mr. Gary Berrigan, Senior Environmental Planner
California Department of Transportation (Caltrans) District 1
P.O. Box 3700
Eureka, California 95502-3700

Dear Mr. Berrigan:

This letter is in response to your submittal entitled: "Eureka to Arcata Corridor Improvement Project Conceptual Mitigation Plan (CMP)," dated April 2011, and your previous submittals requesting our concurrence with your CMP. The proposed mitigation sites are located on Old Samoa Road, adjacent to Route 255 (T6NR1E, SW1/4 of Sec 30) and Demello South at the end of Lamphere Rd (T6N R1W, SW1/4 of Sec 13 and NE ¼ Sec 23, and NW 1/4 Sec 24), in the Cities of Eureka and Arcata, Humboldt County, California. This CMP was submitted for consideration to provide compensatory mitigation for unavoidable impacts associated with the Eureka/Arcata 101 Corridor Improvements Project .

Under the provisions of 33 C.F.R. Section 332.8(d)(3), the CMP was first submitted as a draft prospectus, presented to the Interagency Review Team (IRT) on May 18, 2010. Following this meeting we requested additional information on the proposed mitigation sites in our letters dated October 20, 2011, and February 15, 2011. After conferring with the respective IRT members, obtaining comments from various state and federal agencies, reviewing your letter of December 8, 2010, reviewing your CMP submittal of April 2011, and our teleconference with you on May 11, 2011, we are providing you with our preliminary CMP concurrence that the CMP may be a suitable means to provide compensatory mitigation pursuant to Section 404 of the Clean Water Act of 1972, as amended (33 U.S.C. § 1344 et seq.) and Section 10 of the Rivers and Harbor Act of 1899, as amended (33 U.S. C. § 403 et seq.).

We concur that the potential for wetland re-establishment exists at the Demello South property. A detailed mitigation plan will assist in our evaluation of the amount of wetland mitigation credit available. The Old Samoa Road parcel is problematic as it is already existing wetlands. Similarly, your detailed proposal for this site will assist in our evaluation of the amount of wetland mitigation credit that may be available. Our staff is available for consultation as you develop your plans.

Please be aware that a final mitigation plan in accordance with the requirements of 33 CFR Section 332.4(c) must be submitted to the Corps, and must be approved by the District Engineer prior to issuance of a permit.

You may refer any questions on this matter to Carol Heidsiek of our Regulatory Division by telephone at 707-443-0855. All correspondence should be addressed to the Regulatory Division, USACE, Eureka Field Office, 601 Startare Drive, Box 14, Eureka, California 95501 referencing the File Number at the head of this letter. We appreciate the opportunity to work with your staff on this project.

Sincerely,

Jane M. Hicks

Jane M. Hicks
Chief, Regulatory Division

Copies Furnished:

US EPA (Attn: Melissa Scianni)
NOAA Fisheries (Attn: Dan Free)
US FWS (Attn: Greg Schmidt)
CA DFG (Attn: Gordon Lepid)
CA RWQCB (Attn: Stephen Bargsten)
CA CC (Attn: John Dixon)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

June 23, 2010

Gary Berrigan
Chief, North Region Environmental Management
California Department of Transportation
District 1, P.O. Box 3700
Eureka, CA 95502-3700

Subject: Preliminary Least Environmentally Damaging Practicable Alternative for the Route 101 Eureka Arcata Corridor Improvement Project, Humboldt County, California

Dear Mr. Berrigan:

The Environmental Protection Agency (EPA) has reviewed the California Department of Transportation's (Caltrans') May 2010 404(b)(1) Alternatives Analysis Addendum for the proposed Route 101 Eureka Arcata Corridor Improvement Project, Humboldt County, California. We appreciate the continued interagency coordination efforts by Caltrans in accordance with the process outlined in the *National Environmental Policy Act/Clean Water Act (CWA) Section 404 Integration Memorandum of Understanding* (NEPA/404 MOU) of April 2006.

EPA understands that Caltrans is proposing that a Modified Alternative 3A is the preliminary least environmentally damaging practicable alternative (LEDPA). We previously agreed that Alternative 3A was the preliminary LEDPA, based on information contained in the Draft Environmental Impact Statement (DEIS), information provided in June 2 and June 9, 2009 conference calls, and the 404(b)(1) Alternatives Analysis provided with the request for agreement. Based on the recent Alternatives Analysis Addendum, we understand that Alternative 3A was modified to accommodate left turns from Airport Road to southbound Route 101, resulting in an estimated increase of 0.5 acre of jurisdictional wetland impact, and a total permanent jurisdictional impact of 8.2 acres. As our previous agreement on the preliminary LEDPA took into consideration the greater energy use and community impacts of induced out-of-direction travel with some of the alternatives, we again consider these impacts and agree that the Modified Alternative 3A is the preliminary LEDPA.

In our July 22, 2009 letter, EPA agreed with Caltrans' plan to establish a wetland mitigation bank to compensate for unavoidable wetland impacts resulting from this project. EPA is participating on the Interagency Review Team for the proposed wetland mitigation bank and will continue to work with Caltrans through that venue as the mitigation bank proposal develops.

Thank you for the opportunity to provide these comments. EPA will also provide comments on the Final EIS pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. Please send two hard copies and 1 electronic copy of the Final EIS to the address above (mail code: CED-2). If you have any questions, please contact me (dunning.connell@epa.gov; 415- 947-4161), or the lead reviewers for the project: Carolyn Mulvihill (Environmental Review Office, mulvihill.carolyn@epa.gov; 415-947-3554), or Melissa Scianni (Wetlands Regulatory Office, scianni.melissa@epa.gov; 415-972-3821).

Sincerely,

Connell Dunning

Connell Dunning, Transportation Team Supervisor
Environmental Review Office
Communities and Ecosystems Division

cc: Lahn Phan, Federal Highway Administration
Ray Bosch, U.S. Fish and Wildlife Service
Diane Ashton, NOAA Fisheries
Carol Heidsiek, U.S. Army Corps of Engineers

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arcata Fish and Wildlife Office
1655 Heindon Road
Arcata, California 95521
Phone: (707) 822-7201 FAX: (707) 822-8411

In Reply Refer To:
81331-2010-F-0053
8-14-2002-1078

AUG 05 2010

Gary Berrigan
Senior Environmental Planner
Environmental Management Branch E-1
California Department of Transportation, District 1
P. O. Box 3700
Eureka, California 95502-3700

Subject: Least Environmentally Damaging Practicable Alternative and Conceptual Mitigation Plan for the proposed Eureka-Arcata Route 101 Corridor Improvement Project, Humboldt County, California

Dear Mr. Berrigan:

This letter is in reply to your written correspondence, dated May 19, 2010 (received May 21, 2010), requesting concurrence by the Fish and Wildlife Service (Service) regarding the Least Environmentally Damaging Practicable Alternative (LEDPA) and Conceptual Mitigation Plan (CMP) for the California Department of Transportation's (Caltrans) proposed Eureka-Arcata Route 101 Corridor Improvement Project, Humboldt County, California (Caltrans EA 01-366000, 363300). We submit our concurrence to Caltrans in accordance with the process outlined in the *National Environmental Policy Act/Clean Water Act (CWA) Section 404 Integration Process Memorandum of Understanding* (NEPA/404 MOU) of April 2006.

Caltrans previously (July 2009) submitted a NEPA 404(b)(1) analysis to the NEPA/404 signatory agencies (including the Service) proposing Alternative 3A as the LEDPA to wetlands and Other Waters of the U.S. In response to concerns that Alternative 3A would not accommodate left turns from Airport Road to southbound Route 101, Caltrans modified the alternative. Changes to Alternative 3A were described in Caltrans' recent (May 2010) NEPA 404(b)(1) Alternative Analysis Addendum. The Modified Alternative 3A includes a half signal at that intersection to allow southbound Route 101 travelers to make left turns at Airport Road, and for left turns from Airport Road to Route 101 southbound lanes. Based on your Alternative Analysis Addendum the modification would result in impacts to an additional 0.5 acre of U.S. Army Corps of Engineers

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(ACE) jurisdictional wetlands compared to the original Alternative 3A. Despite increased impacts to wetlands, Modified Alternative 3A meets LEDPA criteria because it balances overall benefits (i.e., increased access to Airport Road, reduction in out-of-direction travel) with environmental impacts. The Service concurs that Caltrans' Section 404(b)(1) analysis demonstrates that Modified Alternative 3A meets the criteria for LEDPA and that Modified Alternative 3A would result in the least overall environmental harm while meeting the project need and purpose.

In a letter dated April 29, 2010, Caltrans proposed the establishment of a wetland mitigation bank in the northern Humboldt Bay area as compensatory wetland mitigation for permanent impacts to 9.8 acres of wetland resources and temporary impacts to an additional 4.3 acres from the Eureka-Arcata Corridor Improvement Project. Caltrans submitted a draft prospectus to the Service outlining the mitigation creation strategy that includes two parcels totaling 116 acres. Caltrans believes that development of the Humboldt Bay Transportation Mitigation Bank (Bank) will provide sufficient mitigation credits to satisfy required compensatory mitigation for the Eureka-Arcata Corridor Improvement Project, and possibly additional credits that can be used for future Caltrans projects. On May 18, 2010 the Service attended the first meeting of the Interagency Review Team for the proposed Bank, where Caltrans presented the draft prospectus and discussed the merits of the proposal, the type of wetland restoration proposed for the two mitigation parcels, and amount of mitigation credits they could expect for the two parcels.

The Service agreed with Caltrans that the proposed Bank parcels would adequately compensate for impacts to wetlands anticipated for Modified Alternative 3A (the preliminary LEDPA) of the Eureka-Arcata Corridor Improvement Project. However, the Service (correspondence with Caltrans via email on May 18, 2010) and other agency representatives felt that the proposed Bank parcels would receive more mitigation credits if they were restored to saltwater wetlands with muted tidal flow than if they were restored to freshwater wetlands as originally proposed by Caltrans in their draft Bank prospectus. Maintenance of a freshwater wetland adjacent to Humboldt Bay may be difficult or impossible with projected sea level rise. In contrast, a restored tidal wetland could better adjust to rising sea level and would be gradually converted to tidal mudflat with increasing sea level.

Please contact staff biologist Gregory Schmidt at (707) 825-5103 should you have further questions.

Sincerely,

Nancy J. Finley
Field Supervisor

cc:
Caltrans District 1, Eureka, California (Attn: Gail Popham)
CDFG, Eureka, California (Attn: Gordon Leppig)
FHWA California Division, Sacramento, California (Attn: Lahn Phan)
U.S. Environmental Protection Agency, San Francisco, California (Attn: Carolyn Mulvihill)
U. S. Army Corps of Engineers, San Francisco, California (Attn: Laurie Monarres)
NOAA Fisheries Service, Arcata, California (Attn: Kasey Sirkin)
California Coastal Commission, Eureka, California (Attn: Melanie Faust)
North Coast Regional Water Quality Control Board, Santa Rosa, California (Attn: Jeremiah Puget)
Humboldt County Association of Governments (Attn: Spencer Clifton)

Gary Berrigan/D01/Caltrans/CAGov

07/27/2010 03:50 PM

To Mitch Higa/D01/Caltrans/CAGov@DOT
cc
bcc
Subject Fw: Eureka/Arcata Corridor NEPA 404(b)(1) Process

fyi..

----- Forwarded by Gary Berrigan/D01/Caltrans/CAGov on 07/27/2010 03:49 PM -----

Clarence Hostler <Clarence.Hostler@noaa.gov >

07/27/2010 03:32 PM

To 'Gary Berrigan' <gary_berrigan@dot.ca.gov>
cc
Subject RE: Eureka/Arcata Corridor NEPA 404(b)(1) Process

Correct. Currently, NMFS is not preparing a response, nor does NMFS plan to do such. The agreed-upon process may progress without a NMFS response. Thank you for checking. Clarence Hostler

-----Original Message-----
From: Gary Berrigan [mailto:gary_berrigan@dot.ca.gov]
Sent: Tuesday, July 27, 2010 3:26 PM
To: Clarence.Hostler@noaa.gov
Cc: Mitch Higa
Subject: Eureka/Arcata Corridor NEPA 404(b)(1) Process

Hi, Clarence...this is to confirm our conversation this afternoon that NMFS will not be providing comments on the LEDPA and CMP as part of the NEPA 404 process for the Eureka/Arcata Corridor Project...Gary

Gary Berrigan, E-1 Branch Chief
North Region Environmental Management
707.441.5730

Appendix F Traffic Noise Fundamentals

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. There are several noise measurement scales, which are used to describe noise. The *decibel (dB)* is a unit of measurement, which indicates the relative amplitude of a sound. Zero on the decibel scale is based on the lowest sound level that a healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a wide range of intensities. Since decibels are logarithmic units, sound pressure levels are not added arithmetically. Two sounds of equal sound pressure level are added; the result is a sound pressure level that is three dB higher. For example, if the sound pressure level were 70 dB when 100 cars pass an observer, then it would be 73 dB when 200 cars pass the same observer. Doubling the amount of energy would result in a 3 dB increase to the sound pressure level.

Frequency relates to the number of pressure oscillations per second, or Hertz (Hz). The range of sound frequencies that can be heard by healthy human ears ranges from about 20 Hz at the low frequency end to 20,000 Hz (20kHz) at the high frequency end.

There are several methods of characterizing sound. The most common is the *A-weighted sound level or dBA.* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Studies have shown that the A-weighted Leq is closely correlated with annoyance to traffic noise.

Noise Descriptors. Because sound levels can vary over a short period, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called Leq. A common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration. The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus one dBA.

Human Response to Noise. Studies have shown that under controlled conditions in an acoustics laboratory, a healthy human ear is able to discern changes in sound levels of one dBA. In the normal environment, the healthy human ear can detect changes of about two dBA; however, it is widely accepted that changes of three dBA in the normal environment are considered barely detectable to most people. A change of five dBA is readily perceptible and a change of ten dBA is perceived as being twice as loud.
Sound Propagation. When sound propagates over a distance, it changes in both level and frequency content. The manner in which noise is reduced with distance depends on the following important factors:

Geometric spreading. Sound from a single source (i.e., a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates

(or drops off) at a rate of six dBA for each doubling of distance. Highway noise is not a single, stationary point source of sound. The movement of the vehicles on a highway makes the source of the sound appear to emanate from a line (i.e., a "line" source) rather than from a point. This results in cylindrical spreading rather than the spherical spreading resulting from a point source. The change in sound level from a line source is three dBA per doubling of distance.

Ground absorption. Most often, the noise path between the highway and the observer is very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dBA per doubling of distance for a line source and 7.5 dBA per doubling of distance for a point source.

Atmospheric effects. Research by Caltrans and others have shown that atmospheric conditions can have a substantial effect on noise levels, especially locations beyond 200-feet of a highway. Wind has been shown to be the single most important meteorological factor within approximately 500-feet, whereas vertical air temperature gradients are more important over longer distances. Other factors, such as air temperature, humidity, and turbulence, also have significant effects. Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lower noise levels.

Shielding by natural or human-made features. A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by this shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (such as hills and dense woods) and human-made features (such as buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver to specifically reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least five dB of noise reduction. A higher barrier may provide as much as twenty dB of noise reduction.

Appendix G Plant Species Observed

A list of all plant species encountered during botanical surveys completed for the Route 101 Corridor Improvement Project is provided below. Species in bold type are special status plants.

Scientific Name (Hickman 1993)	Scientific Name (Baldwin et al. 2012)	Common Name
TREES		
Abies concolor		grand fir
Alnus rubra		red alder
Cupressus macrocarpa	*Hesperocyparis macrocarpa*	Monterey cypress
Eucalyptus globulus		blue gum eucalyptus
Ilex aquifolium		holly
Picea sitchensis		Sitka spruce
Pinus contorta ssp. *contorta*		shore pine
Pinus muricata		Bishop pine
Pinus radiata		Monterey pine
Populus balsamifera ssp. *trichocarpa*	*Populus trichocarpa*	black cottonwood
Rhamnus purshiana	*Frangula purshiana*	cascara
Salix lasiolepis		arroyo willow
Sequoia sempervirens		redwood
Thuja plicata		western red cedar
SHRUBS		
Acacia decurrens		black wattle
Baccharis pilularis		coyote brush
Boronia sp.		Boronia
Cotoneaster sp.		cotoneaster
Escallonia rubra		escallonia
Genista monspessulana		French broom
Lonicera involucrata var. *ledebourii*		twinberry
Myrica californica	*Morella californica*	wax myrtle
Nerium oleander		oleander
Rhododendron sp.		rhododendron
Ribes sanguineum var. *glutinosum*		pink-flowering currant
Ribes sp.		currant or gooseberry
Rosa pisocarpa subsp. *pisocarpa*		rose
Rubus discolor	*Rubus armeniacus*	Himalayan blackberry
Rubus spectabilis		salmonberry
Rubus ursinus		California blackberry
Salix lasiolepis		arroyo willow
Salix scouleriana		Scouler's willow
Sambucus racemosa var. *racemosa*		red elderberry
Toxicodendron diversilobum		poison oak
Vaccinium ovatum		evergreen huckleberry

Scientific Name (Hickman 1993)	Scientific Name (Baldwin et al. 2012)	Common Name
HERBS		
Achillea millefolium		common yarrow
Agropyron sp.		wheatgrass
Agrostis hallii		Hall's bentgrass
Agrostis stolonifera		creeping bentgrass
Aira caryophyllea		silver hair grass
Alisma plantago-aquatica		water plantain
Allium triquetrum		white flowered onion
Alopecurus geniculatus		water foxtail
Anagallis arvensis		scarlet pimpernel
Anaphalis margaritacea		pearly everlasting
Angelica lucida		**seacoast angelica**
Anthoxanthum odoratum		sweet vernal grass
Artemisia douglasiana		mugwort
Aster chilensis	*Symphyotrichum chilense*	California or Chile aster
Athyrium filix-femina		lady fern
Atriplex triangularis	*Atriplex prostrata*	fat-hen
Avena barbata		slender wild oat
Avena fatua		wild oat
Baccharis douglasii	*Baccharis glutinosa*	marsh baccharis
Bellis perennis		English lawn daisy
Brassica nigra		black mustard
Brassica rapa		common mustard
Briza maxima		rattlesnake grass
Briza minor		little rattlesnake grass
Bromus carinatus var. *carinatus*		California brome
Bromus diandrus		ripgut brome
Bromus hordeaceus		soft brome
Bromus tectorum		cheatgrass
Cardamine oligosperma		western bittercress
Carduus pycnocephalus		Italian thistle
Carex lyngbyei		**Lyngbye's sedge**
Carex obnupta		slough sedge
Carex praegracilis		clustered field sedge
Castelleja ambigua* ssp. *humboltiensis		**Humboldt Bay owl's-clover**
Cerastium fontanum var. *vulgare*		large mouse-ear chickweed
Cerastium glomeratum		mouse ear chickweed
Chamomilla suaveolens		pineapple weed
Cichorium intybus		chicory
Cirsium vulgare		bull thistle
Cistus sp.		Rockrose
Claytonia sp.		candyflower
Conium maculatum		poison hemlock
Cordylanthus maritimus* ssp. *palustris	***Chloropyron maritimum* subsp. *palustre***	**Point Reyes bird's-beak**
Cortaderia selloana		pampas grass

Scientific Name (Hickman 1993)	Scientific Name (Baldwin et al. 2012)	Common Name
Cotula coronopifolia		brass buttons
Crepis sp.		hawksbeard
Cynodon dactylon		Bermuda grass
Cynosurus echinatus		hedgehog dogtail grass
Cyperus eragrostis		nut sedge
Dactylis glomerata		orchard grass
Danthonia sp.		oatgrass
Daucus carota		wild carrot
Deschampsia cespitosa		California hair grass
Digitalis purpurea		Foxglove
Dipsacus fullonum		wild teasel
Dipsacus sativus		Fuller's teasel
Dipsacus sp.		teasel
Distichlis spicata		Saltgrass
Eleocharis macrostachya		Spikerush
Elyhordeum stebbinsianum (Hordeum brachyantherum x Elymus glaucus)		Stebbin's barley
Elymus glaucus		blue wildrye
Epilobium ciliatum ssp. *ciliatum*		willow herb
Equisetum telmateia ssp. *braunii*		giant horsetail
Erechtites glomerata		New Zealand fireweed
Erechtites minima	*Senecio minimus*	coastal burnweed
Erodium cicutarium		redstem filaree
Erodium moschatum		musk or white-stemmed filaree
Eschscholzia californica		California poppy
Euphorbia peplus		petty spurge
Festuca arundinacea		tall fescue
Festuca pratensis		meadow fescue
Festuca rubra		red fescue
Foeniculum vulgare		fennel
Fragaria chiloensis		sand strawberry
Galium aparine		goose grass
Geranium bicknelli		Bicknell's geranium
Geranium dissectum		cutleaf geranium
Geranium molle		dovefoot geranium
Geranium retrorsum		New Zealand geranium
Grindelia stricta var. *platyphylla*		Pacific gum plant
Grindelia stricta var. *stricta*		coastal gumplant
Hedera helix		English Ivy
Heracleum lanatum	*Heracleum maximum*	cow parsnip
Hirschfeldia incana		short-pod mustard
Holcus lanatus		velvet grass
Hordeum murinum ssp. *leporinum*		foxtail barley

Scientific Name (Hickman 1993)	Scientific Name (Baldwin et al. 2012)	Common Name
Hydrocotyle ranunculoides		marsh pennywort
Hypericum perforatum	*Hypericum perforatum* subsp. *perforatum*	common St. John's-wort
Hypochaeris radicata		cat's-ear
Iris douglasiana		Douglas iris
Juncus articulatus		Jointed rush
Juncus balticus		common rush
Juncus bufonius var. *bufonius*		toad rush
Juncus effusus var. *brunneus*	*Juncus hesperius*	coast or bog rush
Juncus effusus var. *pacificus*	*Juncus effusus* subsp. *pacificus*	Pacific rush
Juncus lesueurii		salt rush
Juncus occidentalis		western rush
Juncus phaeocephalus		brown-headed rush
Juncus xiphioides		iris-leaved rush
Kickxia elatine		sharp leafed fluellin
Lactuca sp.		wild lettuce
Lathyrus latifolius		perennial sweet pea
Leontodon taraxacoides ssp. *taraxacoides*		lesser hawkbit
Leucanthemum vulgare		ox-eye daisy
Limonium californicum		marsh rosemary
Linum bienne		narrow leaf flax
Lolium multiflorum	*Festuca perennis*	Italian ryegrass
Lolium perenne	*Festuca perennis*	perennial ryegrass
Lonicera hispidula var. *vacillans*		hairy honeysuckle
Lotus corniculatus		bird's-foot trefoil
Lotus micranthus	*Acmispon parviflorus*	hill lotus
Lupinus arboreus		yellow bush lupine
Lupinus bicolor		miniature lupine
Lupinus rivularis		riverbank lupine
Luzula comosa		Pacific woodrush
Lythrum hyssopifolium		hyssop loosestrife
Madia sativa		coast tarweed
Maianthemum dilatatum		false lily-of-the-valley
Malva parviflora		cheeseweed
Medicago polymorpha		California bur clover
Melilotus alba	*Melilotus albus*	white sweetclover
Melilotus indica		sourclover
Melilotus indicus		yellow sweetclover
Mentha pulegium		pennyroyal
Modiola caroliniana		Carolina bristle mallow
Myosotis discolor		changing forget-me-not
Oenanthe sarmentosa		water parsley
Parentucellia viscosa		yellow parentucellia
Paspalum dilatatum		dallis grass
Pelargonium grossularioides		gooseberry geranium
Phragmites australis		common reed

Scientific Name (Hickman 1993)	Scientific Name (Baldwin et al. 2012)	Common Name
Picris echioides	*Helminthotheca echioides*	bristly ox-tongue
Plantago coronopus		cut leaf plantain
Plantago lanceolata		English plantain
Plantago major		common plantain
Pleuropogon californicus		semaphore grass
Poa annua		annual bluegrass
Poa pratensis ssp. *pratensis*		Kentucky blue grass
Poa trivialis	*Poa trivialis*	rough bluegrass
Polypogon monspeliensis		rabbitfoot grass
Polystichum munitum		western sword fern
Potentilla anserina ssp. *pacifica*		silverweed
Prunella vulgaris var. *lanceolata*		self-heal
Pteridium aquilinum var. *pubescens*		bracken fern
Ranunculus repens		creeping buttercup
Raphanus sativus		wild radish
Rumex acetosella		sheep sorrel
Rumex crispus		curly dock
Salicornia depressa		pickleweed
Salicornia virginica	*Salicornia pacifica*	pickleweed
Sanguisorba minor ssp. *muricata*	*Poterium sanguisorba*	garden burnet
Scirpus cernuus		low clubrush
Scirpus maritimus		prairie bulrush
Scirpus microcarpus		panicled bulrush
Scrophularia californica ssp. *californica*	*Scrophularia californica*	California figwort
Senecio jacobaea		tansy ragwort
Senecio vulgaris		common groundsel
Silene gallica		windmill pink
Silybum marianum		milk thistle
Sonchus asper ssp. *asper*		prickly sow thistle
Sonchus oleraceus		common sow thistle
Spartina densiflora		Dense-flowered cordgrass
Spergula arvensis ssp. *arvensis*	*Spergula arvensis*	stickwort
Spergularia canadensis* var. *occidentalis		**western sand spurrey**
Spergularia macrotheca		sandspurrey
Stachys ajugoides var. *ajugoides*		Ajuga hedge nettle
Stachys rigida		rough hedge nettle
Stellaria media		chickweed
Taraxacum officinale		dandelion
Torilis arvensis		hedge parsley
Trifolium arvense		rabbitfoot clover
Trifolium dubium		little hop clover
Trifolium hirtum		rose clover
Trifolium incarnatum		crimson clover
Trifolium repens		white clover
Trifolium subterraneum		subterranean clover

Scientific Name (Hickman 1993)	Scientific Name (Baldwin et al. 2012)	Common Name
Trifolium variegatum		variegated clover
Trifolium wormskioldii		springbank clover
Triglochin maritima		seaside arrow-grass
Triticum aestivum		common wheat
Tropaeolum majus		garden nasturtium
Typha latifolia		broad-leaved cattail
Valerianella locusta		corn salad
Veronica anagallis-aquatica		water speedwell
Veronica persica		Persian speedwell
Vicia hirsuta		hairy vetch
Vicia sativa ssp. *nigra*		spring vetch
Vicia sativa ssp. *sativa*		common vetch or spring vetch
Vicia tetrasperma		slender vetch
Vinca major		periwinkle
Vulpia bromoides	*Festuca bromoides*	six-weeks fescue
Xanthium strumarium		rough cocklebur

Appendix H Threatened and Endangered Species Lists

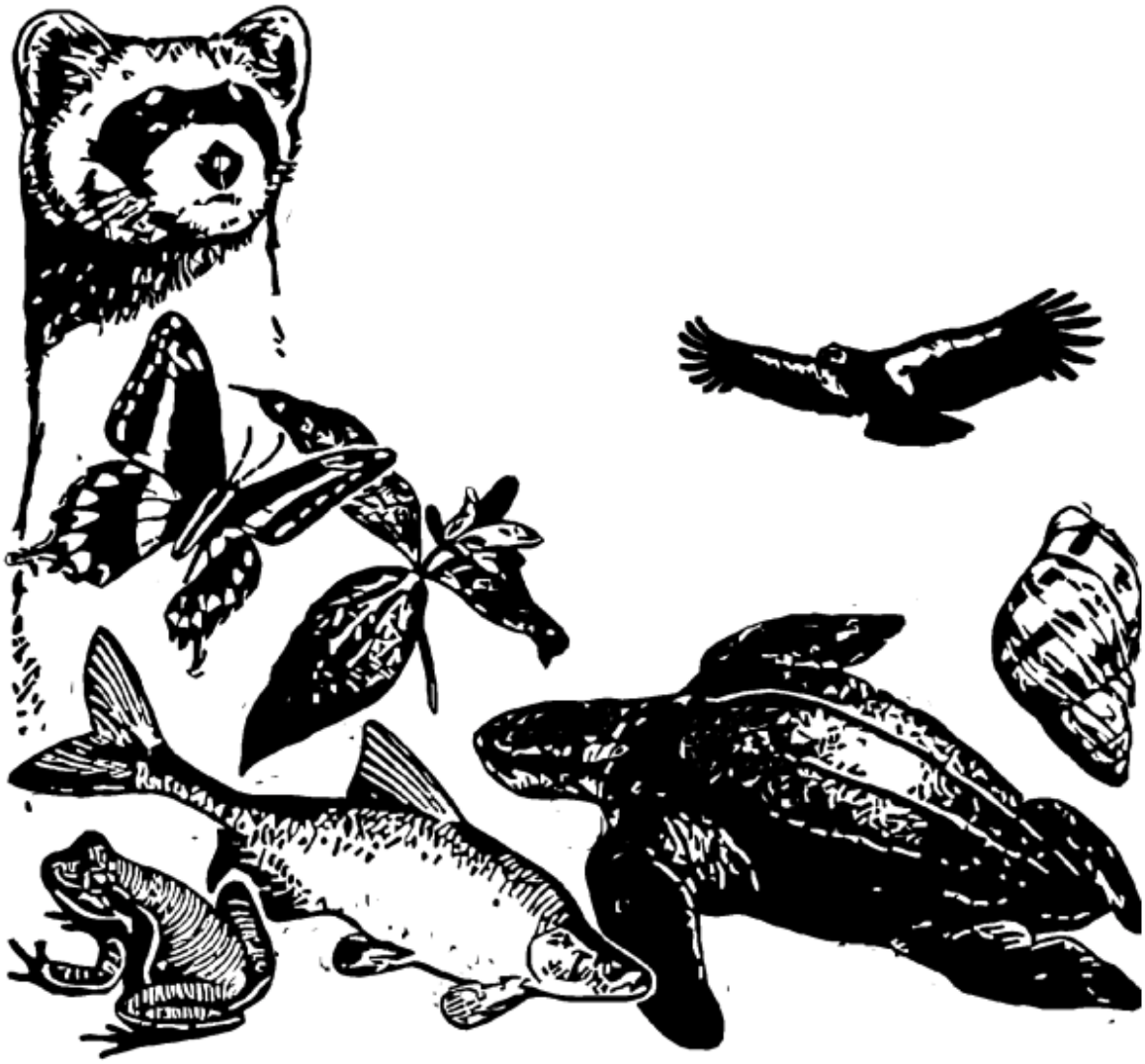
U.S. Fish & Wildlife Service

Eureka Arcata Corridor Route 101

IPaC Trust Resources Report

Generated November 01, 2016 04:26 PM MDT, IPaC v3.0.9

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

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U.S. Fish & Wildlife Service

IPaC Trust Resources Report

NAME

Eureka Arcata Corridor Route 101

LOCATION

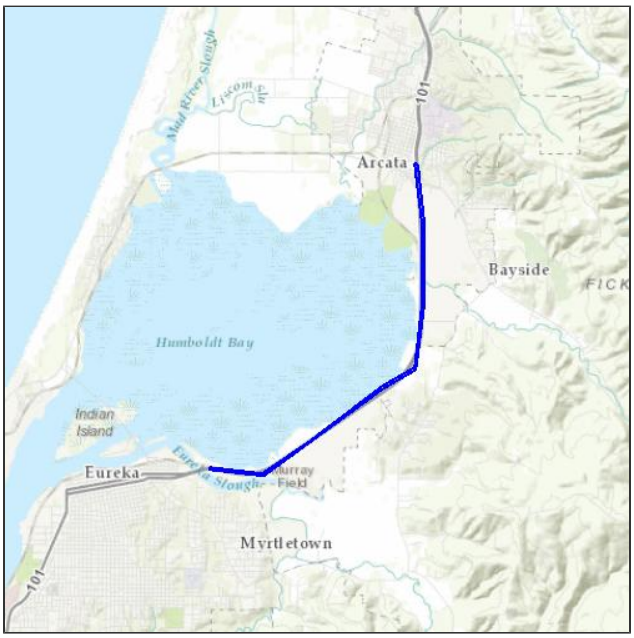
Humboldt County, California

DESCRIPTION

Eureka Arcata Corridor Improvement Project Route 101 Post Miles PM 79.9/86.3
Humboldt County, CA (EA:01-3600)

IPAC LINK

https://ecos.fws.gov/ipac/project/VLOS5-Q6MYZ-COVI5-Y3ZZU-XS2UBY



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Arcata Fish And Wildlife Office
1655 Heindon Road
Arcata, CA 95521-4573
(707) 822-7201

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Marbled Murrelet Brachyramphus marmoratus — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B08C

Northern Spotted Owl Strix occidentalis caurina — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B08B

Western Snowy Plover Charadrius alexandrinus nivosus — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B07C

Yellow-billed Cuckoo Coccyzus americanus — Threatened

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06R

Fishes

Tidewater Goby Eucyclogobius newberryi — Endangered

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E071

Flowering Plants

Beach Layia Layia carnosa — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q34T

Menzies' Wallflower Erysimum menziesii — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q29W

Western Lily Lilium occidentale — Endangered

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=Q1Y0

Critical Habitats

This location overlaps all or part of the critical habitat for the following species:

Tidewater Goby Eucyclogobius newberryi

Final designated critical habitat

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=E071#crithab

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

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1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The following species of migratory birds could potentially be affected by activities in this location:

Allen's Hummingbird Selasphorus sasin — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0LI

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Black Oystercatcher Haematopus bachmani — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0KJ

Burrowing Owl Athene cunicularia — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0NC

Calliope Hummingbird Stellula calliope — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0K3

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Lewis's Woodpecker Melanerpes lewis — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HQ

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B06S

Marbled Godwit Limosa fedoa — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JL

Olive-sided Flycatcher Contopus cooperi — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Purple Finch Carpodacus purpureus — Bird of conservation concern
Season: Year-round

Short-billed Dowitcher Limnodromus griseus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JK

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Snowy Plover Charadrius alexandrinus — Bird of conservation concern
Season: Breeding

Western Grebe aechmophorus occidentalis — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EA

Whimbrel Numenius phaeopus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0JN

Willow Flycatcher Empidonax traillii — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F6

Yellow Warbler dendroica petechia ssp. brewsteri — Bird of conservation concern

Season: Breeding

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EN

Red Knot Calidris canutus ssp. roselaari — Bird of conservation concern

Season: Wintering

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0G6

Wildlife refuges and fish hatcheries

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps all or part of the following National Wildlife Refuges:

Humboldt Bay National Wildlife Refuge

6,850.4 acres

PHONE (707) 733-5406

ADDRESS
1020 Ranch Road
Loleta, CA 95551

http://www.fws.gov/refuges/profiles/index.cfm?id=81590

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Estuarine And Marine Deepwater

E1UB2L

Estuarine And Marine Wetland

E2AB3M

E2EM1N

E2US2N

Freshwater Emergent Wetland

PEM1C
PEM1Cd
PEM1D

Freshwater Forested/shrub Wetland

PFO1A
PFO1C
PSS1C

Riverine

R3UBF
R3UBH

A full description for each wetland code can be found at the National Wetlands Inventory website: http://107.20.228.18/decoders/wetlands.aspx

National Oceanic and Atmospheric Administration (NMFS) Species list of threatened or Endangered or Critical Habitat listed under the Federal Endangered Species Act
Organization: California Department of Transportation (Caltrans)
Project: Eureka-Arcata Corridor, 01-HUM-101, PM 79.9/86.4
Date: November 1, 2016
Source: NMFS Google Earth kmz (June 30, 2016)

X = Present on the Quadrangle		ESA ANADROMOUS FISH (E) = Endangered, (T) = Threatened												ESA ANADROMOUS FISH CRITICAL HABITAT												ESA MARINE INVERTEBRATES		ESA MARINE INVERT. CRITICAL HABITAT	ESA SEA TURTLES				ESA WHALES	ESA PINNIPEDS	ESSENTIAL FISH HABITAT					MMPA SPECIES	
		COHO		CHINOOK			STEELHEAD					Eulachon (T)	Southern DPS Green Sturgeon (T)	COHO		CHINOOK			STEELHEAD					Eulachon	Southern DPS Green Sturgeon	Black Abalone (E)	White Abalone (E)	Black Abalone	East Pacific Green Sea Turtle (T)	Olive Ridley Sea Turtle (T/E)	Leatherback Sea Turtle (E)	North Pacific Loggerhead Sea Turtle (E)	Whales (see list below)	Guadalupe Fur Seal (T)	SALMON		Groundfish	Coastal Pelagic	Highly Migratory Species	MMPA Cetaceans (see "MMPA Species" tab for list)	MMPA Pinnipeds (see "MMPA Species" tab for list)
Quad Name	Quad Number	SONCC (T)	CCC (E)	CC (T)	CVSR (T)	SRWR (E)	NC (T)	CCC (T)	SCCC (T)	SC (E)	CCV (T)			SONCC	CCC	CC	CVSR	SRWR	NC	CCC	SCCC	SC	CCV												Coho	Chinook					
Arcata North	40124-H1	X		X			X					X	X	X		X			X					X	X				X	X	X		X		X	X	X	X		X	X
Arcata South	40124-G1	X		X			X					X	X	X		X			X					X	X										X	X	X	X			X
Blue Lake	40123-H8	X		X			X					X		X		X			X					X											X	X					
Cannibal Island	40124-F3	X		X			X						X	X		X			X						X				X	X	X		X		X	X	X	X		X	X
Eureka	40124-G2	X		X			X						X	X		X			X						X				X	X	X		X		X	X	X	X		X	X
Fields Landing	40124-F2	X		X			X						X	X		X			X						X				X	X	X		X		X	X	X	X		X	X
Iaqua Buttes	40123-F8	X		X			X							X		X			X																X	X					
McWhinney Creek	40124-F1	X		X			X							X		X			X																X	X					
Tyee City	40124-H2	X		X			X					X	X	X		X			X					X	X				X	X	X		X		X	X	X	X		X	X

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Appendix I Federal Endangered Species Consultation Documents

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arcata Fish and Wildlife Office
1655 Heindon Road
Arcata, California 95521
Phone: (707) 822–7201 FAX: (707) 822–8411

In Reply Refer To:
81331-2010-F-0053

NOV 22 2010

Mr. Larry Vinzant
Federal Highway Administration-California Division
650 Capital Mall, Suite 4-100
Sacramento, California 95814

Subject: Reinitiation of Formal Consultation on the Proposed Eureka-Arcata Corridor Improvement Project, U.S. Highway 101, Humboldt County, California (Caltrans EA 01-366000 and 01-363300)

Dear Mr. Vinzant:

This correspondence responds to the California Department of Transportation's (Caltrans) request, dated May 3, 2010, for reinitiation of formal consultation on the Eureka-Arcata Corridor Improvement Project (Caltrans EA 01-366000 and 01-363300) (Project, or proposed action), located on Highway 101, in Humboldt County, California. The Biological Assessment (BA) that accompanied your request described changes to the proposed action and potential effects to the federally-listed as endangered tidewater goby (*Eucyclogobius newberryi*; goby) and designated goby critical habitat, and concluded that the proposed action may affect, and is likely to adversely affect, gobies and designated goby critical habitat.

This document transmits the Fish and Wildlife Service's (Service's) biological opinion (BO) based on our review of modifications made to the proposed action that have occurred since completion of formal consultation and issuance of a BO and Incidental Take Statement (ITS), dated May 28, 2008. This document was prepared in accordance with the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*) and its implementing regulations (50 CFR §402). Documents related to this consultation are on file in this office.

TAKE PRIDE® IN AMERICA

CONSULTATION HISTORY

May 28, 2008	The Service's Arcata Field Office (AFWO) issued a BO and an ITS for anticipated effects to the goby and goby designated critical habitat associated with the project. The AFWO's conclusion was that the action was not likely to jeopardize the continued existence of the tidewater goby. The AFWO concurred with the Federal Highway Administration (FHWA) that the proposed action may affect, but was not likely to adversely affect designated critical habitat.
May 7, 2010	The AFWO received a request from the FHWA-California Division, Sacramento, California for reinitiation of formal consultation on effects to gobies and goby designated critical habitat due to modifications of project design since the AFWO issued the BO and ITS on May 28, 2008.
June 8, 2010	Gregory Schmidt (AFWO) sent a memorandum to Larry Vinzant (FHWA-California Division) and to Gary Berrigan (Senior Environmental Planner) and Gail Popham (Associate Environmental Planner and point of contact for this project), of Caltrans District 1, Eureka, California, acknowledging receipt of letter (with BA) requesting re-initiation of formal consultation for potential negative effects to gobies and goby critical habitat.
June 17, 2010	Gregory Schmidt (AFWO) contacted Gail Popham (Caltrans) for additional information on several of the project actions near the southbound (SB) Jacoby Creek Bridge to aid in determining the level of potential effects to gobies and goby critical habitat. They discussed possible conservation measures to avoid or minimize impacts to gobies during demolition of the SB Jacoby Creek Bridge.
August 24, 2010	Gregory Schmidt (AFWO) and Gail Popham (Caltrans) discussed potential effects (to the tidewater goby) of the proposed rock weir for the triple tide gate that will be replaced at Gannon Slough. The opinion of AFWO goby experts Greg Goldsmith and Steve Kramer was that the rock weir would have no direct negative effects on or provide direct benefits to the tidewater goby or goby critical habitat. Therefore, potential effects of rock weir construction and possible changes to estuarine habitat near the triple tide gate would not be analyzed in the biological opinion.
August 30, 2010	Gregory Schmidt (AFWO) provided a review draft of the *Description of the Proposed Action* section of the AFWO's biological opinion to Gail Popham (Caltrans) and Todd Lark (Caltrans project engineer).

September 8, 2010 Gregory Schmidt (AFWO) received a revised project description from Gail Popham (Caltrans) and Todd Lark (Caltrans). The revised project description removed all references to the use of "falsework" during bridge rail replacement and demolition of the SB Jacoby Creek Bridge and provided corrections to the dimensions of the new SB Jacoby Creek Bridge. They also provided details on the total area of the Jacoby Creek wetted channel workers would need to walk in to install, maintain, and remove the debris containment systems used during demolition of the SB Jacoby Creek Bridge. Finally, Caltrans provided an estimate of the total amount of time workers would be walking in the wetted channel to deal with the aforementioned containment system.

September 20, 2010 Gregory Schmidt (AFWO) received a map from Gail Popham (Caltrans) confirming the location of the tide gate on Brainard Slough that will be replaced by Caltrans as part of the proposed action. Another question was whether this tide gate would be replaced with a standard tide gate or a fish-friendly tide gate. Because the tide gate provides a hydrological connection between the fish-bearing Brainard Slough and the northbound Route 101 drainage ditch to the north, a fish-friendly tide gate will be installed. The new fish-friendly tide gate may provide gobies access to potential suitable habitat in the Route 101 ditch to the north of Brainard Slough to the Bayside Cutoff.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Caltrans proposes to make operational and safety improvements, and to resurface, restore, and rehabilitate the roadway along a 6.4-mile (mi.) section of U.S. Highway 101 (Route 101) in Humboldt County, California extending from the Eureka Slough Bridge in Eureka, California north to the 11th Street Overcrossing in Arcata, California (Fig. 1). The project includes one bridge replacement, bridge railing replacements, tide gate replacements, extending acceleration and deceleration lanes, paving, median barrier upgrades, and lighting upgrades. Elements of the proposed project include closing median crossings, constructing an interchange, and signalizing an intersection on Route 101 at Airport Road. Bridge work is required to bring the structures up to current design standards to improve safety. Equipment involved in this project will likely include concrete trucks, dump trucks, backhoes, cranes, excavators, sump pumps, trenchers, jackhammers, generators, pavers, rollers, graders, and bobcats. The project will take approximately 25 weeks to complete and is scheduled to begin as early as 2012.

PROPOSED CONSTRUCTION ACTIVITIES

Bridge Work

Replacement of the SB Jacoby Creek Bridge

The SB Jacoby Creek Bridge will be replaced because of its age and poor condition. The new bridge will be approximately 75 feet (ft.) long and 51.4 ft. wide (about 12.4 ft. wider than the current bridge). The new bridge will have a 5 ft. left shoulder, two 12 ft. wide lanes, a 10 ft. right shoulder, and an 8 ft. bicycle/pedestrian lane separated from motorized traffic by a barrier. The additional width is to allow for wider shoulders, improved bridge rail, and improved safety for bicyclists and pedestrians. The new bridge will be single span with no piers in the stream channel – unlike the current bridge, which is a 3-span structure with piers in the active, wetted creek channel.

The new bridge will be erected to the east of the current alignment and serve as a temporary detour bridge. Fourteen 36-inch (in.)-diameter steel-pipe piles (7 on each creek bank, 3 for the temporary bridge abutments, and 4 for the new bridge abutments) will be vibrated, oscillated, or rotated into place on the stream banks 15–30 ft. from the wetted creek channel. The depth that the piles will need to be set is ≤ 100 ft. Excavated earth may be removed from inside the upper section of the steel pipe piles and filled with reinforced concrete. After the piles are installed, pile caps will be constructed to form the abutment footings. Then, the new bridge deck will be placed. The new deck will consist of several pre-cast reinforced concrete longitudinal sections transported to the site. A concrete wear surface will be poured in place. Pavement and bridge railing will be added afterward. The new SB Jacoby Creek Bridge will then be moved into place using the jack-and-slide method. Bridge replacement will involve the following:

1. In the median on both sides of Jacoby Creek, two areas (each about 54 ft. by 15 ft. by 6 ft. deep) will be excavated, east of the existing bridge, for temporary detour bridge abutments.
2. Within each of these excavations, three 36-in.-diameter steel-pipe piles will be installed on the banks of Jacoby Creek 15–30 ft. from the active, wetted channel.
3. Temporary forms and reinforcing will be placed in the excavations and concrete pile cap abutments will be poured.
4. On the temporary detour bridge abutments, east of the existing bridge, the new bridge will be installed. The sections of the new bridge will be lowered into place with a crane, cemented/bolted together, paved and the bridge rail installed.
5. Temporary fill will be placed and the temporary approaches will be paved east of the current highway.
6. Southbound traffic will be diverted to the new bridge in its temporary position east of the current alignment.
7. The remaining 36-in.-diameter steel-pipe piles (approximately 4 on each side of Jacoby Creek) and pile caps will be installed on the banks 15–30 ft. from the channel in line with the original highway for the final-alignment abutments.

8. The SB roadway will be closed for one night. Using the jack-and-slide method, the new bridge will be moved west to the original alignment with the highway.
9. The pile caps of the temporary detour bridge abutments will be covered with soil and the area will be returned to its original contours.

Demolition of the old SB Jacoby Creek Bridge

1. A temporary debris containment system will be mounted to either the existing bridge support piers, or placed on the banks of the creek (*i.e.*, no supports within the wetted channel of the creek). Adequate containment materials will be placed to allow for removal of the concrete deck and beams, while minimizing the possibility for debris to enter the creek channel.
2. The existing bridge rails will be removed with a small hoe-ram, jackhammers and\or concrete saws. The deck will be taken out piece by piece from above using a crane or excavator, a small hoe-ram, jackhammers and\or concrete saws.
3. After the existing bridge deck and beams are removed from above, the containment system will have construction debris removed from it, and then it will be removed or modified for use as a pier removal debris containment system.
4. The piers left standing within the channel will be cut off above the low tide waterline of Jacoby Creek. This will be accomplished by tightly wrapping containment material to the piers below the waterline, then using an equipment-mounted or hand-held pneumatic/hydraulic hammer, chip the concrete away from the reinforcing steel, then cut off the steel with a torch (or saw), and finally a crane or excavator with a tether to the pier will break off and place the pier tops outside of the creek channel. The piers at the bridge abutments will be broken off at an elevation sufficiently low enough to accommodate the new bridge and foundation.

Replacement of Bridge Barrier Rails

Barrier rail replacements on Northbound (NB) Jacoby Creek and NB Gannon Slough bridges will widen both bridges by 16 in. to accommodate the new bridge rail. The usable width of the lanes (11 ft. and 12 ft.), the right shoulder (10 ft.), and the left shoulder (4 ft.) will match the existing bridge. The new, wider bridge rails will be cantilevered from the existing NB bridges.

Tide Gate Replacement

Nine tide gates at six different locations within the action area will be replaced. To improve fish passage in tide-gated sloughs and channels in the action area, four of the nine tide gates within the action area will be replaced with fish-friendly tide gates. Each fish-friendly tide gate contains a small adjustable secondary door (approximately 12 in. by 12 in.) that can be raised or lowered to allow muted tidal flow. Muted-flow tidal conditions help perpetuate current habitat conditions present inland of the tide gate, such as minimum and maximum water level, salinity, and water level fluctuations.

All of the present tide gates are the standard top-hinged flap gate design, either round or rectangular. At the locations where federally-listed fish (*e.g.*, salmonids and tidewater gobies) may be present, fish-friendly tide gates will be installed. If there are fish present at a location with more than one tide gate, only one fish-friendly tide gate will be installed. The Route 101 Channel (*i.e.*, the drainage ditch and associated wetland habitat on the east side of Route 101 from Indianola Cutoff south approximately 2.5 mi. to Airport Road), Old Jacoby Creek, Brainard Slough, and Gannon Slough are locations where both gobies and salmonids may be present. The two remaining tide gate locations have no upstream fish habitat, so these replacement gates will not have a fish-friendly design: 1) the gate on the roadside drainage that enters Eureka Slough south of Jacobs Avenue; and 2) the gate on California Redwood Sawmill ditch that enters at Route 101 Channel.

Where there is no suitable habitat for listed salmonids and tidewater gobies upstream of a tide gate, the gate will be replaced with a flexible rubber tide gate. The opening of this style of tide gate is a vertical slot in a single molded piece of rubber that is mounted at the outlet of the culvert. The vertical opening is flexible and the default position is closed. When the hydraulic head differential changes, the slot opens and water flows downstream. The hydraulic head differential needed to open this type of gate is quite small, so the water flows out slowly. This design is low maintenance and debris will not prevent the gate from closing: The flexible nature of the opening allows it to close over debris and form a seal.

There are a number of tide gate configurations available to create a muted tidal regime in the channel and to provide fish passage. These include a permanent, adjustable guillotine gate that creates a continual passage, a Muted Tide Regulator (MTR) Gate, and Mitigator Fish Passage Gate (Giannico and Souder 2005). The final tide gate design selection will be determined in cooperation with the Service, National Marine Fisheries Service (NMFS), and the California Department of Fish and Game (CDFG).

The operation of the tide gates will need to balance the fish passage needs of listed salmonids and the habitat needs of tidewater goby. Therefore, operation of the tide gates and subsequent habitat enhancement will likely be linked to future restoration activities unrelated to the action. Caltrans will contract with a qualified consultant approved by the Service to monitor the tide gates for flow levels and salinity for 2 years after the project ends. Caltrans will be responsible for tide gate operation and maintenance after the 2-year monitoring period.

All replacement gates will make use of existing headwall structures. They will be installed at the same level as the existing gates. The tide gate work will generally consist of removing the existing tide gates and likely re-drilling and installing new stainless steel anchors epoxied into existing concrete. The new tide gates will generally be placed by cranes then bolted into place. There are existing access roads to each of the tide gate locations, with the exception of the 24 in. tide gate south of Jacobs Avenue, which outlets adjacent to the NB Eureka Slough Bridge: The replacement work in this area will likely be accessed by foot. Tide gates will be replaced during low tide. Even at low tide there may be a small amount of run-off flow, and one or two workers may have to enter the channel to position and install the new gate. Therefore, some minor turbidity is anticipated.

On the bay side of the tide gates at Gannon Slough, a weir constructed of approximately 100 cubic yards of 1/4-ton rock, along with smaller rock and fines will be built to allow pooling that will enhance fish passage. The rock will also extend for several feet up the side banks to help prevent erosion. This rock will cover an area 40 ft. by 20 ft. by about 3 ft. deep. In August 2006, the City of Arcata installed a new gate with an auxiliary door at Gannon Slough parallel to and at a lower elevation than the existing Caltrans tide gates. The new gate that Caltrans is installing at Gannon Slough will provide additional opportunity for fish passage.

Other Roadway Work

Interchange at Indianola Cutoff

Route 101 will be elevated up to 25 ft. above the existing highway to allow for an undercrossing at the intersection with Indianola Cutoff. There will be one bridge for the narrow interchange with a median barrier. Indianola Cutoff will be maintained at its present alignment and grade. No watercourses will be impacted by the construction of the interchange.

Right Side Deceleration/Acceleration Lanes

Right hand deceleration and acceleration lanes will be lengthened from 400 to 800 ft. at 11 locations. The deceleration/acceleration lanes will include minimum 4-ft. wide right-side shoulders, with the exception of Airport Road and Indianola Cutoff, where 8-ft. wide shoulders will be provided. Other deceleration/acceleration lanes within the project limits will remain the same.

To lengthen the deceleration/acceleration lanes on SB Route 101 at the California Redwood Sawmill, the roadway widening will occur within the median to minimize impacts to wetlands, waters of the U.S., and to avoid the removal of approximately 200 to 300 large (DBH 18 to 36 in.) blue gum eucalyptus (*Eucalyptus globulus*) trees on the right shoulder. To provide a deceleration and acceleration lane at the California Redwood Sawmill entrance, the southbound lanes will be realigned approximately 8 ft. toward the median to avoid impacting the trees. There are also a number of trees that occur within the clear recovery zone (CRZ) (within 30 ft. of the edge of traveled way). Several of these trees will be protected with metal beam guardrail, and the remainder of the trees within the CRZ will be removed.

Median Crossings

Median crossings will be closed at Mid-City Motor World, California Redwood Sawmill, Bracut, and Bayside Cutoff. At Airport Road a signal will be installed, so the median will remain open. Median closures will consist of the removal of dense grade asphalt concrete (AC) paving and possibly some excavation and seeding of the bare slopes with native or cultivated grasses.

Median Barrier

Thrie-beam median safety barrier and a 5-ft. wide weed barrier will be installed in the Route 101 median between the Eureka Slough bridges and Airport Road. The thrie-beam median traffic barrier will be reinstalled on the vegetated median of Route 101 from South G Street to the 11th Street Overcrossing in Arcata with a weed barrier.

Shoulders and Curbs

The existing curb and asphalt-concrete shoulder will be replaced with 8-ft. wide paved shoulders at the Route 101/255 interchange and South G Street ramp.

Paving

Paving work will include AC and open grade asphalt concrete (OGAC) overlay from Eureka Slough Bridge to the 11th Street Overcrossing in Arcata; work also includes grinding existing OGAC and placing shoulder backing. The expressway section from post mile (PM) 79.9 to 84.7 will provide 4 ft. left shoulders, an 11 ft. lane, a 12 ft. lane, and a 10 ft. paved shoulder. Material will be added as required to maintain a minimum of 1 ft. of shoulder backing to the hinge point throughout the project limits. Within the freeway section (PM 84.7 to 86.3), there will be spot locations where the pavement will need to be widened to maintain a minimum of 10 ft. paved right side shoulder; this will be an increase in width of up to 2 ft. at PM 84.7 to 86.3 northbound and southbound. The resulting roadway will have a 5 ft. left shoulder, two 12 ft. lanes and a 10 ft. right shoulder. Shoulder backing will be placed, a minimum of 3 ft. wide, adjacent to the paved surfaces. The additional paving will increase impervious surface by approximately 4.75 acres (ac.; a 6.7 percent increase). Approximately 0.3 ac. will be temporarily (up to 2 years) paved for the detour bypassing the SB Jacoby Creek Bridge while it is being replaced.

Addition or Replacement of Roadway Lighting

Roadway lighting will be added or replaced on mainline Route 101 at Cole Avenue, Indianola Cutoff, Bayside Cutoff, South G Street, and the Route 101/255 Interchange. New electrical conduit will be installed between the lights and services. Exact locations of the electrical facilities will be determined at a later phase of the project.

Installation of Metal Beam Guard Railing (MBGR)

Metal beam guard railing with the appropriate end treatments will be installed at three billboards adjacent to the SB Route 101 lane south of Bracut to protect errant vehicles from striking the billboards: The existing billboards are outside of the existing State highway right-of-way, but are within the 30 ft. CRZ. Existing MBGR will be reset or reinforced. New MBGR may be placed at some locations to protect errant vehicles from fixed objects (trees) within the CRZ.

Tree and Shrub Removal

For traffic safety, and because of widening for deceleration/acceleration lanes, approximately 38 trees and two shrub hedges will be removed from the corridor. Some of this vegetation is in the Jacoby Creek riparian zone. Temporarily disturbed areas of tree removal will be replanted with native, ecologically appropriate small tree and shrub species that meet safety and CRZ requirements.

Removal of Safety Corridor Signage

Safety Corridor (*i.e.*, PM 79.9 to 84.5) signage will be removed upon completion of the project.

CONSERVATION MEASURES

When used in the context of the Act, "conservation measures" represent actions proposed by the Federal agency that are intended to further the recovery of and/or to minimize or compensate for project effects on the species under review. Because conservation measures are pledged in the project description by the action agency, their implementation is required under the terms of the consultation (U. S. Fish and Wildlife Service and National Marine Fisheries Service 1998). The following measures will be incorporated into the project to avoid or minimize adverse project effects:

Bridge Work

1. To avoid barotrauma injury to fish, no piles will be installed in the active, wetted creek channel for the new SB Jacoby Creek Bridge or for rail replacement for the NB Jacoby Creek and NB Gannon Slough bridges. For the new SB Jacoby Creek Bridge, piles will be vibrated, oscillated, or rotated into place on the bank 15–30 ft. from the wetted channel. Impact driving will not be used for any bridge work.

2. Piers from the old SB Jacoby Creek Bridge will be cut above the low tide level to avoid injury or death of gobies and impacts to designated goby critical habitat or primary constituent elements (PCEs) of designated goby critical habitat. Bridge piers will be removed above the level of the stream substrate without excavation or the use of isolation casings.

3. To avoid and minimize impacts to the watercourses, all bridge debris will be contained. The demolition debris containment system may be mounted on the existing bridge piers, and/or placed on the stream banks outside of the wetted channel. Containment will minimize the potential for bridge demolition debris to enter any watercourse.

4. No construction equipment will work within the active, wetted creek channel; however, workers will need to walk within the stream to install, maintain, and remove the debris containment system. The contractor will be required to submit a demolition plan, to be approved by the Caltrans resident engineer, to describe methods and measures to be taken to restrict or minimize construction debris from entering the creek channel and to avoid or minimize the amount and extent of workers walking in the stream channel. The demolition plan will prohibit the use of any structure placed within the wetted channel of Jacoby Creek and require that demolition activities be scheduled during low tidal flows to minimize watercourse impacts.

5. The contractor will be required to place temporary barrier fencing (or a similar form of visual barrier) along the entire length of the north and south banks of Jacoby Creek, within the vicinity of the SB and NB Jacoby Creek bridges, to minimize visual disturbance to gobies and to prevent workers from crossing the creek during routine movements within the action area. In addition, the contractor will build or install a temporary footbridge that construction workers may use to cross the creek without walking in the wetted channel. Both ends of the footbridge must be placed outside the wetted channel.

6. Excavations for the temporary detour bridge abutments will be above the mean high tide line, avoiding the water of the active, wetted Jacoby Creek channel.

7. To ensure that all minimization and avoidance measures are implemented, a biological monitor will be present during all instream activities associated with removal of the old SB Jacoby Creek Bridge and piers. The biological monitor will also ensure that the temporary footbridge and the visual barrier have been properly installed and maintained.

Fish-friendly Tide Gates

1. Tide gates will be installed during low tide (*i.e.,* when old tide gates are out of the water) to minimize sediment release into waterways and to avoid injuring or killing gobies that may occur at the tide gate sites when water is present.

2. Pre-project hydrologic conditions will be assessed upstream of the existing tide gates by a qualified biological consultant (approved by the Service and the NMFS). Water conditions will be recorded daily by the biological consultant for at least one year prior to construction.

3. The biological consultant will make the preliminary settings to the adjustable fish-friendly tide gates. Since the gates are being replaced because they no longer close effectively, the new adjustable gates will be opened enough to mimic the current hydrology. Once the tide gates are installed, upstream water conditions will be monitored daily and the adjustable gate will be opened or closed slightly until average weekly post-construction conditions are within 95 percent of pre-construction conditions.

4. Monitoring and adjustment will continue on a bi-monthly basis for one year following tide gate installation. There will be no monitoring of water conditions at new tide gates that are not adjustable (*i.e.*, tide gate at the Jacobs Avenue Ditch and California Redwood Sawmill Ditch).

Rock at Gannon Slough Tide Gate

To minimize the amount of sediment released during construction of the rock weir at the Gannon Slough triple tide gate, all work will be conducted during low tide. Low water levels (or no water) during low tide will also avoid injury or death to gobies (and other fish species) that may occur in the vicinity of the tide gates when water levels are higher.

Sediment and Erosion Control

Best Management Practices (BMPs) will be used to stabilize all bare soil areas over both the short- and long-term and to minimize impacts to water quality, aquatic habitat and listed fish.

1. The contractor will be required to develop and implement site-specific best management practices, a Water Pollution Control Plan, and emergency spill controls.
2. Any debris and sediment will be contained within the work site, or diverted into a sedimentation basin before being returned to any receiving waters. Excess material excavated from the work site will be disposed of off-site at an approved disposal site away from any stream course.
3. When construction is complete, watercourse banks will be returned to natural contours. The upper 6 in. of excavated material will be side-cast and then replaced, and, if necessary, seeded and planted with native and ornamental plant species. Revegetated areas will be monitored for up to 4 years or until 80 percent success rate is achieved.
4. Silt fences, straw bales, and/or fiber rolls will be placed to control sediment discharge; minimal sediment will be released into receiving waters.
5. Measures will be taken to prevent construction equipment discharges from contaminating soil or waters in the construction site.
6. Excavated spoils will be controlled to prevent sedimentation to the stream.
7. Certified weed-free straw mulch, silt fences, straw bales, and/or fiber rolls will be applied to exposed soil areas for over-wintering protection from erosion.
8. No concrete washings or water from concrete will be allowed to flow into waterways. No concrete will be poured within flowing water in the waterways. Water that has come into contact with setting concrete will be pumped into a tank and disposed of at an approved disposal site.

Staging Areas

1. Primary staging areas will be on Route 101 shoulders with possible additional staging areas on nearby private property. No staging area will be located within an environmentally sensitive area.
2. At the end of each work shift, any vehicles stored within 150 ft. of the Ordinary High Water (OHW) of drainage facilities, watercourses, sloughs, or Humboldt Bay will have spill prevention measures in place for refueling. This includes placement of an absorbent boom around the fuel port (on the machine being fueled), as well as a thick absorbent mat that is rolled out on the ground under the equipment to catch a larger spill. When fueling vehicles and other equipment, there will be a person located at both the fuel nozzle and the truck valve so that emergency shut-off could be made if there was a nozzle or hose failure.

3. All equipment remaining on the job site will have secondary containment placed beneath the drip zone when left overnight. Leaks will be immediately controlled with absorbent mats and repaired before the equipment operates again. Clean up of petro-chemical drips will occur as soon as they are observed. All equipment will be monitored by the contractor daily for chemical leakage. To offer protection from storm events Caltrans will require monitoring for storm events and moving equipment accordingly.

STATUS OF THE SPECIES AND CRITICAL HABITAT

Legal Status

On February 4, 1994, the tidewater goby was listed as endangered throughout its entire historic range (59 FR 5494; U. S. Fish and Wildlife Service 1994). The Service did not designate critical habitat when the species was listed, explaining that, "In the case of the tidewater goby, critical habitat is not presently determinable. A final designation of critical habitat requires detailed information on the possible economic effects of such a designation. The Service does not currently have sufficient information needed to perform the economic analysis."

On September 18, 1998, the Natural Resources Defense Council, Inc. filed a lawsuit in Federal District Court in California against the United States Department of the Interior *et al.* for failure to designate goby critical habitat. On April 5, 1999, Judge Carlos R. Moreno ordered that the "Service publish a proposed critical habitat designation for the tidewater goby in 120 days" (Natural Resources Defense Council, Inc. v. United States Department of the Interior *et al.* CV 98–7596).

On June 24, 1999, the Service published a proposed rule to: (1) delist populations of goby in areas north of Orange and San Diego counties, California, and (2) retain goby populations in Orange and San Diego counties as endangered based on our re-evaluation of the species' status throughout its range (64 FR 33816; U. S. Fish and Wildlife Service 1999).

On August 3, 1999, the Service proposed critical habitat for the goby in Orange and San Diego counties (64 FR 42250); but did not propose critical habitat for the species throughout the rest of its geographic range in 1999 because the Service had proposed to delist the species where it occurred in areas north of Orange County. On November 20, 2000, the Service designated critical habitat for the goby in Orange and San Diego counties (65 FR 69693). The critical habitat designation consisted of 10 coastal stream segments that collectively measured 9 linear mi. in length.

On November 7, 2002, the Service withdrew their proposal to delist the goby in areas north of Orange County (67 FR 67803; U. S. Fish and Wildlife Service 2002). Therefore, the goby has remained listed as an endangered species throughout its historic geographic range since 1994.

On August 31, 2001, Cabrillo Power L.L.C. (Cabrillo) filed a lawsuit in the U.S. District Court for the Southern District of California challenging a portion of the final rule that designated the 10 critical habitat units in Orange and San Diego counties. Specifically, Cabrillo objected to the

critical habitat unit involving Agua Hedionda Lagoon and Creek. In a consent decree dated February 27, 2003, the U.S. District Court: (1) agreed to vacate the critical habitat designation involving Agua Hedionda Lagoon and Creek; (2) stated the nine other critical habitat units should remain in effect; (3) stated the final rule designating critical habitat was remanded in its entirety for reconsideration; and (4) directed the Service to promulgate a revised critical habitat rule that considers the entire geographic range of the goby and any currently unoccupied goby habitat. The consent decree required that the Service submit proposed and revised rules to the Federal Register no later than November 15, 2006, and November 1, 2007, respectively.

A proposed revised critical habitat rule was published in the Federal Register on November 28, 2006. The rule proposed to designate approximately 10,003 ac. range-wide. This was an increase of approximately 8,422 ac. from the previous critical habitat designation, and a considerable expansion to the north.

The Service published a final rule designating critical habitat for the goby on January 31, 2008 (73 FR 5920; U. S. Fish and Wildlife Service 2008). The final rule included designation of 10,003 ac. range-wide in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles counties, California.

Taxonomy and Life History

Accounts of the taxonomy, ecology, and reproductive characteristics of the goby are found in the following publications: final rule listing the species (59 FR 5494; U. S. Fish and Wildlife Service 1994), proposed rule to delist northern goby populations (64 FR 33816; U. S. Fish and Wildlife Service 1999), final rule withdrawing the Service's proposal to delist the northern goby populations (67 FR 67803; U. S. Fish and Wildlife Service 2002), Recovery Plan (U. S. Fish and Wildlife Service 2005a), and final rule designating critical habitat for the goby (73 FR 5920; U. S. Fish and Wildlife Service 2008).

The goby is a small gray-brown fish rarely exceeding 2 in. in length. They have large pectoral fins, and the pelvic, or ventral fins are joined to each other below the chest and belly from below the gill cover back to just anterior of the anus. Male gobies are nearly transparent with a mottled brownish upper surface. Females develop darker colors, often black, on the body and dorsal and anal fins.

The goby is a short-lived species; the lifespan of most individuals appears to be about one year (Irwin and Soltz 1984; Swift *et al.* 1989). They prey opportunistically on benthic invertebrates including small crustaceans, insect larvae and snails (Swift *et al.* 1989; Irwin and Soltz 1984; Swenson and McCray 1996). They use three different foraging styles to capture prey; plucking prey from substrate surface, sifting sediment in their mouth, and mid-water capture (U. S. Fish and Wildlife Service 2005a).

The goby has only been found in California, and occurs in coastal brackish water habitats, such as lagoons, tidal bays and estuaries of rivers and streams along the coastline. The species is unique among Pacific coast fish in its restriction to brackish waters of coastal wetlands where the

water is fairly still but not stagnant. They are weak swimmers concentrating in slack-water areas and generally avoiding swiftly moving waters. The species appears to spend all life stages in these brackish waters but may enter marine environments when flushed out by flooding or breaching of sandbars.

Gobies are most commonly found in areas with muted or intermittent connectivity to tidal waters (Chamberlain 2006). Relatively low salinities (*i.e.*, less than 10–12 parts per thousand [ppt]), are frequently characteristic of these habitats. However, the species has been collected in salinities as high as 63 ppt (Goldsmith 2006). The species' tolerance of high salinities likely enables it to withstand some exposure to the marine environment, allowing it to recolonize nearby lagoons and estuaries following flood events (U. S. Fish and Wildlife Service 2008). Gobies also occur in freshwater streams up-gradient and tributary to brackish habitats; the salinity of these freshwater streams is typically less than 0.5 ppt. They can occur 1.6 to 7.3 mi. (2.6 to 11.7 km) upstream from the ocean environment (Irwin and Soltz 1984; Swift *et al.* 1997; Chamberlain 2006; and Goldsmith 2006). Although the reasons for the variation in up-stream movement between one locality and another have not been determined, stream gradient and velocity are likely to be important factors.

Previous sampling for gobies has most commonly occurred in water less than 6 ft. deep (Wang 1982; Worchester 1992). Consequently, most observations have been made within this depth range. However, gobies were recently collected in Big Lagoon in Humboldt County during the breeding season at a water depth of 15 ft. (4.6 meters [m]) (Goldsmith 2006).

Gobies have been documented in habitats with water temperatures that range from 46 to 77 degrees Fahrenheit (8 to 25 degrees Celsius) (Irwin and Soltz 1984; Swift *et al.* 1989).

Current and Historical Range

The goby historically ranged from Tillas Slough in Del Norte County south to Agua Hedionda Lagoon in San Diego County. The species is currently found entirely within the original known range. The known localities are discrete lagoons, estuaries, or stream mouths separated by marine conditions. Natural gaps in the species' distribution occur where the coastline is steep and streams do not form lagoons or estuaries. Some of the largest gaps in distribution occur in Humboldt and Mendocino counties, as well as in northern Sonoma County. From Tomales Bay southward to San Francisco, habitat loss and other anthropogenic-related factors have resulted in the creation of unnatural gaps in the species' distribution where the species is absent from several locations where it historically occurred (Capelli 1997). Several large natural and unnatural gaps occur between San Francisco Bay and San Diego County. Gobies have been documented at 134 localities within the historical geographic range of the species. Of these 134 localities, 23 (17 percent) are considered extirpated and 55 to 70 of the localities are naturally so small or have been degraded that long-term persistence is uncertain (U. S. Fish and Wildlife Service 2005a).

Reproductive Biology

Reproduction can occur at any time of the year, but peak spawning usually occurs in the spring and then again in late-summer (Swenson 1999). Males excavate burrows, typically in clean coarse sand but also in mud, in which females lay an average of about 400 eggs per clutch. Females can lay 6 to 12 clutches per year (Swenson 1999). Males remain in the nest burrow to guard the eggs. Larvae emerge in 9 to 10 days, and live in a pelagic form, becoming benthic after reaching a length of about 0.5 to 0.7 in. (Moyle *et al.* 1995). Length of the pelagic larval period is not well studied, but is believed to last anywhere from a couple of days to 2 weeks or more (Camm Swift, ENTRIX, Inc., pers. comm.). Spawning occurs in lagoons/estuaries from April through November. Suitable water temperatures for nesting range from 75.6 to 79.6 °F (most likely a limiting factor in Brainard Slough or Humboldt Bay), with salinities ranging from 2 to 27 ppt. Larvae emerge and live in vegetated areas until they reach 0.5–0.7 in. length, when as juveniles they ascend and occupy streams for rearing.

Threats

Factors responsible for the historic decline and extirpation of goby populations and habitat include: human development in coastal salt marsh and riparian habitats, dredging, channelization of rivers, loss of habitat due to sediment deposition from upstream watershed disturbances, upstream water diversions that alter downstream flows, drought, groundwater overdrafting, and agricultural and sewage discharge (*i.e.*, pollution) (59 FR 5494; U. S. Fish and Wildlife Service 1994). Existing threats to the goby include historic threats, as well as artificial breaching of creek mouths and lagoons, extreme weather and streamflow conditions, predation by introduced species including mosquitofish (*Gambusia affinis*), sunfish (*Lepomis* spp.), and bass (*Micropterus* spp.), and competition with introduced species (*e.g.*, yellowfin goby [*Acanthogobius flavimanus*] and chameleon goby [*Tridentiger trigonocephalus*]) (U. S. Fish and Wildlife Service 2005a).

Conservation Strategy

The Recovery Plan for the tidewater goby (U. S. Fish and Wildlife Service 2005a) provides a strategy for recovery that is designed to: (1) preserve the diversity of habitats throughout the range, (2) preserve the natural processes of recolonization and population exchange that enable population recovery following catastrophic events, and (3) preserve genetic diversity (U. S. Fish and Wildlife Service 2005a). Recovery actions include: (1) protecting and enhancing currently occupied habitat, (2) conducting biological research to enhance the ability to integrate land use practices with tidewater goby recovery, (3) evaluating and implementing translocation where appropriate, and (4) increasing public awareness about gobies.

The Recovery Plan subdivides the geographic distribution of the goby into 6 recovery units, encompassing a total of 26 sub-units defined according to genetic differentiation and geomorphology. A description of each recovery unit and subunit with recommended tasks for recovery are provided in Appendix G of the Recovery Plan (U. S. Fish and Wildlife Service 2005a).

The Recovery Plan states that downlisting may be considered when the following criteria have been met: (1) specific threats to each metapopulation, such as; habitat destruction and alteration, introduced predators, and competition with introduced species have been addressed through the development and implementation of individual management plans that cumulatively cover the full range of the species, and (2) a metapopulation viability analysis based on monitoring over a 10-year period indicates that each Recovery Unit is viable. Downlisting criteria for the North Coast Recovery Unit specifies that 5 of the 6 identified sub-units must have at least 75 percent chance of persistence for a period of 100 years. The delisting criterion specifically calls for a 95 percent chance of persistence for a period of 100 years (U. S. Fish and Wildlife Service 2005a).

Current Conditions (Range-wide)

Current conditions incorporate the effects of all past human and natural activities or events that have led to the present-day status of the species (U. S. Fish and Wildlife Service and National Marine Fisheries Service 1998).

Habitat: Amount, Distribution and Quality

The wetland habitat of individual goby localities varies on a site-specific basis, and is affected in part by local precipitation patterns and topography. For example, in coastal areas where the topography is steep and precipitation is relatively low, the habitats occupied by tidewater gobies may be a few acres in size, only extend a few hundred feet inland from the ocean, and backwater marshes may be small or absent. In coastal areas, where topography is less steep and precipitation is more abundant, habitats occupied by gobies may be hundreds of acres in size, extend many miles inland, and contain extensive backwater marshes (U. S. Fish and Wildlife Service 2008).

Appendix E in the Recovery Plan describes for each of 151 localities of known and potential habitat within 26 recovery subunits, the relative amount and quality of existing habitat (U. S. Fish and Wildlife Service 2005a). The amount of habitat is characterized by a description of the size of water bodies and available habitat: large, medium, and small. Large water bodies are those meeting at least one of the following general physical parameters: streams with channel bankfull widths in excess of 66 ft. at any point and/or with estuarine (areas with salt water intrusion) habitats exceeding 0.6 mi. in length; or lagoons and ponds larger than 5 ac. surface area. Medium sized water bodies include smaller streams less than 66 ft. bankfull width and/or estuaries longer than 328 ft. but less than 0.6 mi. in length. Medium sized lagoons and ponds have a surface area between 1 ac. and 5 ac. in size. Small water bodies include the remaining streams, ditches, sloughs, lagoons, and ponds that are smaller than the dimensions of medium sized water bodies.

Rangewide, 49 (32 percent) localities contain large water bodies, 44 (29 percent) contain medium sized water bodies, 55 (36 percent) contain small water bodies, and 3 (2 percent) localities were not ranked. The relative quality of habitat is characterized by a statement of the need for habitat restoration at a particular locality (*i.e.*, much, some, or none). Rangewide, 61 (40 percent) localities require much restoration, 80 (53 percent) require some restoration, 9 (6 percent) require no restoration, and 1 site was not ranked.

The distribution of currently occupied, historically occupied, and potential habitat is discontinuous along the California coast. Several large natural gaps in habitat occur throughout the North Coast Recovery Unit, where the coastline is steep and streams do not form lagoons or estuaries. The Greater Bay Unit contains unnatural gaps in suitable habitat due to habitat loss and anthropogenic-related factors that have degraded habitat and resulted in the extirpation of species from several historic sites. A large natural gap in habitat occurs in the north half of the Central Coast Recovery Unit. Both natural and unnatural gaps in habitat occur throughout the Conception, LA/Ventura and South Coast Recovery Units (U. S. Fish and Wildlife Service 2005a).

Population: Numbers, Distribution, and Reproduction

The current range of the species is from Tillas Slough in Del Norte County south to Cockleburr Canyon in San Diego County, 9.2 mi. (14.8 km) north of Agua Hedionda Lagoon. Gobies do not currently occur in Agua Hedionda Lagoon (U. S. Fish and Wildlife Service 2008). The Recovery Plan identifies the following 6 recovery units that encompass the historic and current geographic range of the species: North Coast Unit, Greater Bay Unit, Central Coast Unit, Conception Unit, LA/Ventura Unit, and South Coast Unit (U. S. Fish and Wildlife Service 2005a).

Currently, there are no long-term monitoring programs in place for this species. Population dynamics are not well documented, and few data are available on the general size of goby populations. However, when present, gobies are frequently the most abundant fish species found at a site (Lafferty *et al.* 1999a). Population distribution and density can be highly variable within a site. Gobies have been reported in densities as high as 138 per square meter (sq. m) and as low as 4 per sq. m (U. S. Fish and Wildlife Service 2005a).

Female gobies are capable of producing 500 eggs per clutch, with 6 to 12 clutches produced during their one-year life span (Swenson 1995). As with many fish species, survival rates of goby clutches can be highly variable, with some clutches failing completely.

The goby is known to have formerly inhabited at least 134 localities. In 2005, approximately 17 percent of the 134 documented localities are considered extirpated and 41 to 52 percent are naturally so small or have been degraded over time that long-term persistence is uncertain (U. S. Fish and Wildlife Service 2005a). Recolonization of extirpated localities has been documented when extant populations are present within several kilometers (Holland 1992; Lafferty *et al.* 1999a, 1999b). However, recently gobies have been found in localities considered extirpated that are separated from the nearest population by 6 to 12 mi. These records suggest that distant movement and recolonization is possible (U. S. Fish and Wildlife Service 2005a).

Goby densities are highly variable and can fluctuate from year to year, season to season, and within a sampled area. Therefore, determining goby density can be difficult. The Recovery Plan discusses density surveys that were conducted by Worchester (1992) and Swift and Holland (1998) using meter-square (ms) drop nets. Within an occupied area, gobies were found to be patchily distributed. The results indicated the following range of densities of tidewater gobies per sq. m sampled (twg/ms): Little Pico Creek, San Luis Obispo County: May 1990 0–67 twg/ms, November 1990 0–138 twg/ms, February 1991 0–27 twg/ms, and Camp Pendleton Marine Corps

Base, San Diego County: (all samples in October 1996) San Mateo Creek 2–11 twg/ms, San Onofre Lagoon 1–102 twg/ms, Hidden Creek 0–6 twg/ms, Los Flores Creek 0–4 twg/ms, and French Creek Lagoon1–51 twg/ms.

Current Conditions (North Coast Sub-Unit NC3)

Sub-Unit NC3 of the North Coast Recovery Unit is completely within Humboldt County. The sub-unit extends about 25 mi. in length from the mouth of the Mad River south across Humboldt Bay to the Eel River. The Recovery Plan identifies five localities within Humboldt Bay watersheds. These localities include Freshwater Slough, Mad River Slough, McDaniel Slough/Klopp Lake, KATA Radio Station, and Jacoby Creek/Gannon Slough. These sites were known to exist prior to 2004, during development of the Recovery Plan. In addition, White Slough and Hookton Slough had goby detections that were unknown to the Service until 2005 (Cole 2004). From 2005 to present, gobies have been located in at least five additional areas within Humboldt Bay, including Elk River, Hookton Slough, White Slough, Route 101 Channel, and Rocky Gulch. At the same time, the previously known localities of Klopp Lake and Liscom Slough have been resurveyed without detection. Currently, the status of the Mad River Slough, KATA Radio Station, Klopp Lake, and Route 101 Channel localities is unknown.

The localities within Humboldt Bay encompass approximately 500 to 1,000 ac., although due to the apparent transient nature of some of the populations, it is likely that the area inhabited by gobies at any given time is probably somewhat smaller.

At this time, very little is known about the relationships between goby populations in Humboldt Bay. Research investigations focusing on genetic relationships within Humboldt Bay are underway to determine whether the known locations are inhabited by separate populations, or whether they are part of one larger metapopulation that uses Humboldt Bay as a means of travel from one suitable site to another.

Sub-Unit NC3 also includes the separate Eel River locality, located approximately 8.7 mi. south of Humboldt Bay, connected only via the Pacific Ocean. Extensive surveys have not been conducted to determine the extent of tidewater goby presence in the Eel River.

Habitat Amount, Distribution and Quality

The margins of Humboldt Bay and the Eel River in Humboldt County consist of generally broad low elevation benches historically dominated by mudflats, tidal marshes, estuarine channels, and brackish marshes. Within these complex estuaries, a substantial amount of historic salt and brackish marsh habitat was converted to agricultural, urban, and industrial uses through the construction of levees and drainage channels. This alteration in Humboldt Bay resulted in the loss of up to 10,000 ac. of potentially suitable habitat (U. S. Fish and Wildlife Service 2008).

As a result of habitat alteration, several of the localities occupied by the goby do not contain natural sandbars between the ocean and habitat where the species is present. Instead, manmade water control structures, such as tide gates and culverts, exist between tidal waters and the locations where gobies occur. Many of these tide gates have been in place for decades, and in

some cases, they provide habitat conditions similar to those created by the presence of a seasonal sandbar. In fact, most of the occupied goby habitat in both the Humboldt Bay and Eel River estuaries is separated from full tidal influence by tide gates.

The Eel River delta contains many small slough channels and other backwater areas that provide suitable habitat for tidewater gobies, but it also contains larger channels open to direct tidal influence that do not provide suitable habitat. The Eel River is subject to infrequent but severe flooding. In addition to human-caused alterations of the estuary, major floods during the past century may have severely altered habitat in most channels, including the one known occupied location. Much of the suitable habitat in the Eel River is on private lands, and consequently has not been surveyed for tidewater gobies.

Population: Numbers, Distribution, and Reproduction

Mad River Slough. This population was actually not found within Mad River Slough, but in the system of adjacent channels connected to McDaniel Slough, which is separated from Mad River Slough by tide gates. Gobies were first detected in 1988 by Dr. Camm Swift in the inboard ditch immediately north of the levee at the junction of State Highway 255 and Mad River Slough. As a result of that effort, approximately 50 gobies were collected and released, noted as "common". This location was surveyed again in 1999 or 2000 by Dr. Swift, and tidewater gobies were again detected. In addition, gobies were reported in 2001 from nearby Liscom Slough, which is a tributary slough to Mad River Slough approximately 1.3 mi. north of where State Highway 255 crosses Mad River Slough. Gobies were not detected here in subsequent surveys by the Service in 2003.

McDaniel Slough. This location includes the estuary of Janes Creek, as well as tributary slough and ditch channels that run the length of the levee system bordering the northeast portion of Humboldt Bay. This location is connected hydrologically with the Mad River Slough location described above. Goby surveys were conducted here by the Service in 2005 with no detections. In 2006, gobies were found in two tributary channels to the inboard ditch along the levee system.

Arcata Marsh/KATA Radio Station Site. This site was surveyed in July 1975 by Dr. Camm Swift, with detections of 6 or 7 adult gobies, noted as "scarce". This area was resurveyed in 1981 with gobies noted as "common". This area was resurveyed by the Service in 2003 with no detections.

Klopp Lake. This site was surveyed in 1982, resulting in detection of an unknown number of tidewater gobies. Since that time, the only known survey was conducted by the Service in 2004, and resulted in no detections.

Gannon Slough. A tidally muted slough channel system, Gannon Slough includes channels of three small freshwater streams, as well as remnant channels. Gobies were first detected here in 2005 (U. S. Fish and Wildlife Service 2005c), and were present during several subsequent visits in 2005 and 2006. During the initial detection, it was apparent that gobies were breeding in this location. An estimate of density was recorded for this observation, of 1–3 fish per sq. m.

Jacoby Creek. The Jacoby Creek location may be unique among known tidewater goby locations within Humboldt Bay in that it is the only system open to full tidal fluctuation. The location has

been surveyed several times between 1975 and 2010 with detections during most or all survey efforts.

Freshwater Slough. The Service recently discovered gobies in a small elevated channel behind a leaking tide gate adjacent to Wood Creek, a tributary to Freshwater Slough.

Elk River. This location was first documented as containing tidewater gobies in a 2006 survey by the Service.

White Slough and Hookton Slough, Humboldt Bay National Wildlife Refuge. These two locations, in the South Bay portion of Humboldt Bay, were first documented as containing gobies in 2000. The Hookton Slough location was re-located in 2004 by the Service.

To date, monitoring has consisted primarily of conducting presence/absence surveys for the species throughout the north coast. In general, many areas that contain suitable goby habitat remain unsurveyed. From 2005–2007, the Service conducted sporadic presence/absence surveys, in the Gannon Slough system, to monitor goby response to the installation of a new "fish-friendly" tide gate (Greg Goldsmith, AFWO, pers. comm.). Gobies were detected in Gannon Slough during the 2-year span of those surveys.

Primary Constituent Elements of Goby Critical Habitat

As part of our responsibility in designating critical habitat, the Service has identified the known physical and biological features essential to the conservation of the goby as primary constituent elements. Based on current knowledge of the life history, biology, and ecology of the goby, and the requirements of the habitat to sustain the essential life history functions of the species, the Service have determined that the primary constituent elements are:

1. Persistent, shallow (in the range of about 0.3 to 6.5 ft. [0.1 to 2 m]), still to slow moving, aquatic habitat most commonly ranging in salinity from less than 0.5 ppt to about 10–12 ppt, which provides adequate space for normal behavior and individual and population growth.

2. Substrates (*e.g.*, sand, silt, mud) suitable for the construction of burrows for reproduction.

3. Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus, Zostera marina,* and *Ruppia maritima,* that provides protection from predators.

4. Presence of a sandbar(s) or a sill formation across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

Conservation Strategy for North Coast Unit, Sub-Unit NC3

The Recovery Plan identifies the following management tasks for recovery: (1) monitor; (2) establish degree of genetic isolation of the sub-unit; (3) transfer tidewater gobies to the Mad River Estuary, Klopp Lake, Hookton Slough, and White Slough from the Mad River Slough, Jacoby Creek, Gannon Slough, KATA Station, and Freshwater Slough; (4) consider other sites around the margin of Humboldt Bay for transfer of gobies; and (5) consider localities for transfer from persisting sites after 2 years of absence (U. S. Fish and Wildlife Service 2005a). No efforts to transfer tidewater gobies from one location to another have occurred to date in the North Coast Unit.

We anticipate that the persistence of the goby source population within this unit may require protection of localities that are not occupied every year, but collectively form a source population through an interconnected complex of channels and shallow water habitats. That is, any of the several known occupied localities within a channel complex may be used by gobies during various years in response to dynamic habitat conditions during seasonal, annual, and longer term climatic cycles (*e.g.*, drought). Data collected by the Service within the HUM-3 unit since 2002 suggest that in some locations where gobies were recently present, they were subsequently found to be absent. These data support the idea that tidewater gobies within the unit appear to use locations intermittently.

The interconnectivity of habitat within this unit will reduce the chance of losing the goby along this portion of the coast, help conserve genetic diversity within the species, and help facilitate colonization of currently unoccupied locations.

Recently, significant restoration efforts have occurred or are anticipated to occur within this unit. The outcome of these restoration efforts for gobies is unknown, and will likely vary with their design features and location, but in general, net gains of tidewater goby habitat should result.

Known threats in this unit that may require special management include: coastal development, channelization of habitats, non-point and point source pollution, and cattle grazing. Threats related to coastal development are not well defined for this unit, but could result from a variety of construction related projects in and adjacent to designated critical habitat. The threats related to channelization of habitats consist of creating, modifying, and maintaining artificial channels designed to drain agricultural lands of surface water. The resulting channels have had water control structures, usually tide gates, installed to protect these lands from tidal inundation. Pollution threats include; the potential for oil spills, other spills associated with transportation on adjacent highways, and pollutants from nearby paper and lumber mills. Grazing threats in this unit include the potential for destruction of critical habitat due to animal use of the channels, by trampling and eroding channel banks, aquatic vegetation, and modification of slough and stream channels. Humboldt Bay is designated as "Water Quality Limited" by the State Water Resources Control Board. These known threats are listed in detail in Appendix E of the Recovery Plan.

ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR §402.02) define the environmental baseline as past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and private actions that are contemporaneous with the consultation in progress.

Action Area

According to 50 CFR §402.02 pursuant to section 7 of the Act, the "Action Area" refers to all areas to be affected directly and indirectly by the Federal action and not merely the immediate area involved in the action. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area.

The action area for this project is Route 101 and the Route 101 right-of-way (on west side 30–65 ft. from roadway; on east side about 40 ft. from roadway) from the north end of the Eureka Slough Bridge, Eureka, California, north to the overcrossing of 11th Street in Arcata, California (Fig. 1). The action area also includes the wetland habitat in and adjacent to Jacoby Creek and Gannon Slough on the west side of Route 101 downstream to the point of mean lower low water, and the channels and wetlands on the east side of the highway draining into the Route 101 Channel (Route 101 Channel), Jacoby Creek, and Gannon Slough and their tributaries within 1 mi. of the Route 101 right-of-way.

Goby Habitat: Type, Distribution, and Quality within the Action Area

A number of channels, sloughs, and creeks flow through the action area into Humboldt Bay. Most of these waters are tidally influenced to one degree or another, including full tidal inundation, muted tidal flow through regulated tide gates, or minor tidal intrusion through old, leaky tide gates. Some of the channels were constructed when dikes and levees were installed to control water flow and create pastureland. Other ditches were created in areas where fill material was extracted for residential, industrial, commercial, and transportation (*e.g.*, the Route 101 Channel) use. In the past, tide gates were installed on many sloughs and drainage channels around Humboldt Bay to prevent saltwater intrusion and increase useable pasturage. Prior to anthropogenic modification, the action area was a mixture of meandering freshwater streams and their estuaries, tidally influenced sloughs, freshwater wetlands, brackish wetlands, and mud flats. The action area is dominated by hydric soils.

During the dry season, in parts of the action area, there can be breaks in hydrologic connections, causing periodic isolation of tidewater gobies. This can result in poor water quality, increased predation from wading birds, stranding from higher quality habitat, and, in extreme conditions, desiccation of the habitat and resident gobies. In contrast, high flows during the wet season, especially in Jacoby Creek, can result in creek bed scouring that destroys goby burrows and can flush gobies into Humboldt Bay. In addition, large portions of the action area are tidally influenced and thus experience daily fluctuations in salinity and water levels, which can be detrimental to the tidewater goby; which prefers relatively stable water levels and salinity.

Status of the Species within the Action Area

Gobies have been found in several of the aforementioned water bodies during surveys conducted between 1996 and 2010. The action area is within North Coast Recovery Unit, Sub-Unit NC3 and includes:

1. ***Route 101 Channel.*** Gobies have been detected in a portion of the road-side channel that extends for over 2.5 mi. along the east side of the northbound lanes of Route 101 from just north of the Indianola Cutoff south to its outlet (through double tide gates managed by Caltrans) into the Eureka Slough. In August 2004, the Service detected gobies in this channel immediately north of the Route 101 entrance to Mid City Motor World (G. Goldsmith, AFWO, unpublished data). Gobies were detected over a short section of the channel, but additional surveys were not conducted to document the extent of goby occupancy throughout the remainder of the 2.5-mi. channel. Extensive surveys for gobies in August 2006, conducted in coordination with Caltrans staff, failed to detect gobies in the Route 101 channel (G. Goldsmith, AFWO, unpublished data). The 2006 surveys sampled a substantial portion of the channel from the private drive across from the California Redwood Company entrance, south to Airport Road. No goby surveys were conducted in the northern portion of the Route 101 Channel because cattails (*Typha latifolia*) dominate the channel resulting in very poor goby habitat due to the anaerobic conditions created by decomposing cattails and other aquatic vegetation.

2. ***Jacoby Creek.*** Jacoby Creek originates southeast of Kneeland, California and flows northwest for about 10 mi. to its outlet at Humboldt Bay, south of Arcata, California. Gobies have been found in the lowest portion of Jacoby Creek in the tidal reach at the immediate margin of Humboldt Bay. Gobies have been detected during several surveys extending back to 1996. In 1996 and 1997, Chamberlain (2006) found gobies in portions of Jacoby Creek near the existing Route 101 bridges (both northbound and southbound), where Jacoby Creek transitions from a freshwater stream to a brackish estuary of Humboldt Bay. The Service detected gobies at this site in 2003, 2004, and 2006 (G. Goldsmith, AFWO, unpublished data). In 2007, gobies were detected in this area during surveys conducted by CDFG (M. Wallace, unpublished data). In November 2009, CDFG conducted two seine hauls in Jacoby Creek just upstream of the northbound Jacoby Creek Bridge on Route 101 and captured 16 gobies (M. Wallace, CDFG, unpublished data). Finally, in May 2010 Service staff conducted 12 seine hauls in the Jacoby Creek Estuary in the vicinity of the Route 101 bridges and confirmed the presence of gobies, with the capture of one specimen.

3. ***Gannon Slough.*** Gannon Slough originates about 2 mi. north in Arcata and extends south along the east side of northbound Route 101 to its outlet into Humboldt Bay just north of Jacoby Creek. Gannon Slough and its tributaries (Beith, Campbell, and Grotzman creeks) provide habitat for gobies, generally above the tide gates (a total of four tide gates occur along Gannon Slough; three are maintained by Caltrans). Gobies have been documented at several locations in Gannon Slough, which has been surveyed above (*i.e.*, upstream) the existing Caltrans' triple tide gate for gobies on several occasions. Gobies were first detected in Gannon Slough in July 2005, when the Service conducted a pre-project survey (U. S. Fish

and Wildlife Service 2005c). Gobies were notably abundant in the section of the channel between the tide gates and the confluence of Gannon Slough with its primary feeder tributary, Beith Creek, approximately 0.25 mi. upstream of the tide gates (W. Pinnix, AFWO, unpublished data). Follow-up surveys in February 2006 detected only a few gobies in the channel itself, but found gobies in small, isolated pools at the high water level. Surveys in May, July, August and September 2006, detected low numbers of gobies in all reaches of Gannon Slough above the tide gates, including some distance above the confluence with Beith Creek in the Campbell Arm, and in small feeder channels draining from the east of the main Gannon Slough channel. An additional survey in June 2007, detected only three gobies in the main reach of Gannon Slough (G. Goldsmith, AFWO, unpublished data). Additional documented occurrences exist of gobies in the channel of Gannon Slough upstream of the tide gates (M. Wallace, CDFG, unpublished data).

A single adult goby was found in 2005 during a pre-project survey, approximately 100 ft. downstream of Caltrans' tide gates. This was the only individual found following intensive sampling in that small area. Since gobies are assumed to be flushed from suitable habitat in Gannon Slough during high flow events, or as part of the species' normal dispersal behavior, we assume this individual was not part of a larger, breeding population in the more marine waters found below the tide gates.

During a September 2006 survey in Gannon Slough (G. Goldsmith, AFWO, unpublished data), several gobies were documented in a small perched pool of brackish water south of the point at which Gannon Slough passes under the existing bridges on Route 101. Gobies occurred in at least three seine hauls in that small pool, and may represent a self-supporting, breeding population.

4. ***Old Jacoby Creek Channel.*** The old Jacoby Creek channel is located approximately 0.2 mi. south of the current Jacoby Creek channel and is hydrologically connected via a drainage ditch that parallels SB Route 101 and via an old channel that connects with the current Jacoby Creek channel approximately 550 ft. downstream from the SB Jacoby Creek Bridge. Caltrans maintains a tide gate that controls flow from the drainage ditch and the connecting channel on the west side of SB Route 101 to the old Jacoby Creek channel located on the east side of NB Route 101. Approximately 3.5 ac. of this portion of the old channel on the east side of NB Route 101 is designated goby critical habitat. No known presence/absence surveys have been conducted in the channel, thus the current status of gobies in this channel is unknown.

5. ***Rocky Gulch Creek***. Just north of Bracut, Rocky Gulch (2.6 mi. long) and Washington Gulch (2.7 mi. long) both outlet into Brainard Slough. Here, Caltrans maintains one tide gate that controls the flow from a drainage ditch north of Brainard Slough. Gobies have been found in Rocky Gulch, upstream from the action area. Although gobies were not detected in Rocky Gulch Creek and its estuary during extensive surveys in May 2005, they were detected during surveys conducted in 2007 by CDFG (M. Wallace, unpublished data) following habitat restoration and tide gate replacement on the lower channel.

No precise information on reproduction is available for gobies occurring in the action area. Several captured gobies were noted to be in breeding condition when captured in Gannon Slough in July 2005 (W. Pinnix, AFWO, unpublished data), yet the distribution and abundance of gobies in breeding condition throughout the action area is unknown.

As mentioned above, goby population densities are highly variable and can fluctuate from year to year, season to season, and within a sampled area. Therefore, determining goby density can be difficult. In August 2006, the AFWO seined nearby McDaniel Slough (Fig. 2) using the survey protocol from the Recovery Plan (U. S. Fish and Wildlife Service. 2005b) in an effort to estimate goby density within the action area for the McDaniel Slough Wetland Enhancement Project. Although the main intent of the survey protocol is to confirm the presence or absence of gobies at a particular location, and not to estimate population size or trend, the AFWO estimated goby density at 6 gobies per acre, based on the capture of 8 gobies in a 1.3-ac. sample area (Goldsmith 2006).

Tidewater Goby Critical Habitat within the Action Area

Approximately 83.6 ac. (5.7 percent of North Coast Recovery Unit, Sub-Unit NC3; and 0.84 percent of all goby critical habitat) of designated goby critical habitat occurs within the action area. This includes approximately 46 ac. associated with Gannon Slough and its tributaries, 18 ac. associated with the Route 101 channel and connected waterways (except the Eureka Slough), 16 ac. associated with Jacoby Creek, and 3.5 ac. associated with the old Jacoby Creek channel just south of the current Jacoby Creek channel (Fig. 2).

EFFECTS OF THE ACTION

This section presents an analysis of the direct and indirect effects of the proposed project on the goby, including the effects of interrelated and interdependent actions. These effects are then evaluated with respect to the conservation needs of the species within the action area along with the environmental baseline and the predicted cumulative effects to determine the overall effect to the species and its critical habitat.

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification (50 CFR §402.02). Interdependent actions are those that have no significant independent utility apart from the action under consideration (50 CFR §402.02). The proposed project is not part of any larger action, and has significant utility by itself. Consequently, no interrelated or interdependent actions exist.

As described above, gobies are known to occur in the action area within the Route 101 Channel, Gannon Slough, Jacoby Creek, Rocky Gulch Creek, and their tidally influenced tributaries. Only Rocky Gulch Creek and connected waterways (*i.e.*, Washington Gulch and Brainard Slough) are outside of designated goby critical habitat. Effects on the goby and its designated critical habitat would primarily occur within the waterways in the immediate vicinity of the actual project work (the project footprint), but could also occur to a limited extent elsewhere in the action area.

Because goby abundance in the action area appears to be highly variable and can fluctuate by season, year, and within a sampling area, precise estimates of the number of gobies (including adults, larval juveniles, and eggs) affected by project activities are not possible. However, based on: 1) a density estimate from surveys conducted within similar habitat just outside the action area, 2) an estimate of the area of affected suitable\critical habitat and, 3) the level and duration of possible impacts to gobies, the Service can estimate the overall effect of the proposed action on the goby population and designated goby critical habitat.

Injury or Mortality

Scientific Basis for Direct Injury or Mortality

Tidewater gobies, their eggs or young could be directly injured or killed as a result of construction related activities:

1. Trampling or other physical damage to tidewater goby nest burrows and the crushing of individuals is possible as a result of construction workers walking in the wetted creek channel to install, maintain, and remove the debris containment systems used during the demolition of the old SB Jacoby Creek Bridge.

2. Excavation work or erosion can cause excessive sedimentation of nest burrows containing eggs and adult males while their mobility is restricted. Sedimentation may occur immediately downstream from the old SB Jacoby Creek Bridge during demolition activities and in Gannon Slough during construction of the rock weir at the triple tide gate.

3. Accidental spill of petroleum products or other waste materials into suitable habitat.

Effect of the Action –Injury and Mortality

Gobies occurring in the area where workers will be walking in the creek potentially could be injured or killed by being crushed, as could larval young or eggs within nest burrows. We consider that this may occur along the wetted channel only in the immediate vicinity of the old SB Jacoby Creek Bridge. Caltrans estimates that workers will be required to walk in the wetted channel of Jacoby Creek only within the footprint of the old 39-ft.-wide bridge and 5 ft. to the east (upstream) and 20 ft. to the west (downstream) of the bridge. Therefore, the total amount of the wetted channel workers are likely to walk in, potentially injuring or killing gobies, is approximately 1920 sq. ft. or 0.044 ac. (*i.e.*, 64 ft. creek length by 30 ft. creek width). The amount of time workers will be walking in the wetted channel of Jacoby Creek will be extremely limited: Caltrans estimates that the initial installation of the demolition debris containment system will require 4 hours, maintenance of the system is expected to require an hour a day for about 14 days (*i.e.*, maximum of 14 hours), and removal will take another 4 hours. To install, maintain, and remove the pier removal debris containment system will involve workers accessing the channel for about 2 hours a day for 6 days (*i.e.,* 12 hours). Therefore, gobies may be exposed to injury or death by workers walking in the wetted channel on 22 occasions for an approximate total of 34 hours over a 25-week construction period.

Extrapolating from the Service's aforementioned McDaniel Slough adult goby density estimate (6 gobies/ac) we anticipate that 1 adult (and eggs or young if nest burrow is crushed) may be killed or injured as a result of workers walking in approximately 0.044 ac. of the wetted channel of Jacoby Creek. Because workers will enter the wetted channel on multiple occasions during the construction period, it is expected that 1 adult goby (and associated nest burrows) will be injured or killed upon each entry as nonresident gobies move into the area to occupy habitat vacated by the displaced (*i.e.*, killed or injured) goby. Although breeding adults are likely to be injured or killed during the proposed action, gobies are prolific breeders and thus capable of quickly replacing the lost individuals.

The likelihood that injury or death may occur as a result of excessive sedimentation or from an accidental spill of oil products or other waste materials associated with this project is considered to be negligible due to the conservation measures within the project description; therefore, we assume there will be no significant risk associated with this potential exposure.

Modification of Suitable and Critical Habitat

Scientific Basis for Suitable and Critical Habitat Modification

The decline of the tidewater goby throughout its range can be attributed to water diversions, dredging, pollution, sedimentation, and urban development on adjacent lands that degrade or destroy suitable habitat or primary constituent elements of the habitat. These threats continue to affect many of the remaining tidewater goby populations (U. S. Fish and Wildlife Service 1994, 2008). Water diversions can either isolate or completely eliminate habitat, while pollution and run-off from development can completely contaminate habitat. Excessive sedimentation may degrade substrate conditions needed for reproduction, and can result in the loss of habitat as shallow wetland areas fill in and become dewatered upland habitat (U. S. Fish and Wildlife Service 1994, 2005a, 2008). Soil compaction may also degrade substrate conditions affecting nest burrow construction; potentially reducing the reproductive capacity of gobies in an impacted area. Changes in tidal influence from the removal of barriers that act to mute tidal exchange can result in the loss of suitable habitat when water velocity increases and protected areas become exposed from a high degree of water volume fluctuation (U. S. Fish and Wildlife Service 2006).

Effect of the Action – Modification of Suitable and Critical Habitat

In the action area, much of the tidewater goby suitable habitat has been designated as critical habitat. Proposed activities that could adversely affect primary constituent elements of critical habitat in the action area are limited to the vicinity of the SB Jacoby Creek Bridge. Although no designated critical habitat will be removed, the installation, maintenance, and removal of the demolition and pier debris containment systems for the old SB Jacoby Creek Bridge may result in compaction of approximately 0.044 ac. of designated critical habitat in the wetted channel of Jacoby Creek. In addition, increased sedimentation may occur in the same area and within designated critical habitat downstream from the SB Jacoby Creek Bridge. The total area that may be impacted by increased sedimentation is approximately 0.29 ac. of the active, wetted channel.

The duration of activities that may lead to soil compaction and sedimentation will be very limited during the construction period (34 hours for soil compaction and during bridge demolition and pier removal for sedimentation) and the debris containment systems used to contain concrete and other materials from falling in the creek during bridge demolition should minimize sedimentation. A small amount of debris is likely to fall into the water during bridge demolition, but the potential effect on gobies and their habitat is expected to be insignificant.

Conservation measures include minimizing the area and amount of time workers spend walking in the wetted channel of Jacoby Creek and installation of a temporary single-span footbridge over Jacoby Creek to allow construction workers to move across the creek without accessing the wetted channel. The impacts to designated critical habitat will likely be insignificant, of short duration, and naturally restored to pre-action conditions soon after the action is completed. The proposed action is not anticipated to result in significant changes to the composition of stream or channel substrate, water quality, or aquatic vegetation.

Disturbance

Scientific Basis for Disturbance Effect

Adverse effects to adult gobies and their young could occur when work activities result in behavioral modifications, such as displacement from a work site that cause a loss or reduction in reproductive effort or survival of individuals. Visual exposure to activity of construction personnel and equipment may harass tidewater gobies, disrupt breeding, and drive fish from suitable habitat.

Effect of the Action –Disturbance

The proposed action may result in 25 weeks of disturbance to gobies due to the visual impacts of construction activities and equipment. Activity of construction workers and construction equipment may disturb foraging and movement patterns and may drive gobies from suitable habitat in the Route 101 Channel, and the Jacoby Creek and Gannon Slough estuaries. The disturbance will be restricted to the immediate vicinity of the bridge work; duration and frequency will be short-term, minor, and localized. Visual disturbance is most likely to occur at Jacoby Creek in the vicinity of the bridges, will be limited at Gannon Slough to the channel directly below the NB bridge and at the triple tide gate, and will likely be insignificant along the Route 101 Channel as gobies have probably become habituated to equipment and traffic along Route 101.

Although only a small portion of the wetted channel of Jacoby Creek will be accessed by construction workers, they will be walking up and down both sides of the creek for up to 25 weeks during construction creating visual disturbance to breeding gobies. Even with a visual barrier fence placed parallel to both banks of the creek, visual disturbance will likely occur. However, the visual barrier fences will at least keep workers from walking across the creek in the vicinity of the two Jacoby Creek bridges; forcing workers to use either the temporary footbridge to cross the creek or the railroad bridge or old SB Jacoby Creek Bridge (once the new temporary SB Jacoby Creek Bridge has been built and opened to traffic).

Visual disturbance of breeding gobies near the Jacoby Creek bridges may lower reproductive output during the 25-week construction period, but shouldn't result in injury or death of gobies, and thus would not jeopardize the continued existence of the species, or even the small population that is known to occupy Jacoby Creek. This is mainly due to the fact that ambient noise, vibrations, and visual disturbance is likely relatively high where Route 101 crosses Jacoby Creek and that breeding gobies have become habituated to this relatively high level of auditory and visual disturbance. Also, seining the creek for gobies requires walking in the creek, and despite many seining surveys conducted in Jacoby Creek, the population still persists. The level of compaction and other forms of disturbance during a survey that covers the entire lower reaches of the creek are probably much more extensive than any impacts from workers walking in the creek, mainly in and around the SB Jacoby Creek Bridge.

Indirect Effects

Indirect effects are those effects which may occur later in time and yet are reasonably certain to occur. Indirect effects may include changes to the hydrology, salinity, water temperature, depth, substrate movement, and tidal cycles that may occur as a result of the implementation of this project, including replacement/widening of the bridges, and replacement of existing tide gates.

The Service does not anticipate adverse changes to the hydrology of any channel as the result of bridge replacement or widening. Any minor changes to substrate, channel morphology, or aquatic vegetation are likely to recover soon after the project is completed.

Replacement of existing tide gates, with new models designed and managed to maintain or improve the quality of habitat for gobies in years following the construction project will benefit gobies throughout the action area. The new fish-friendly tide gates will improve tidal flow, fish passage, and the hydrological connection between occupied goby habitat and nearby unoccupied, but suitable goby habitat: potentially allowing colonization or recolonization of suitable habitat around Humboldt Bay.

Caltrans has proposed to initially adjust these muted tide gates to mimic conditions within the channel that occur prior to the tide gate replacement. Following their replacement, however, there are likely to be opportunities to improve habitat conditions, specifically salinity levels and flow regimes, which can result in improvements to the condition and extent of goby habitat above those tide gates. Indeed, one objective of replacing the tide gates is to allow controlled tidal influence that will increase salinity in the Route 101 Channel, killing the freshwater cattails, which would lead to improved water quality for gobies and better mimic the gobies' natural habitat conditions. Therefore, we do not anticipate long-term adverse effects to gobies from changes to the hydrology within the action area as a result of tide gate replacement and future management.

Tidewater goby critical habitat within portions of the action area (Jacoby Creek and Gannon Slough) will likely be further improved through actions by the Lower Jacoby Creek Estuary Enhancement and South Gannon Slough Tidal Gate Installation Project, which was recently (April 2010) proposed by the City of Arcata. The project will restore estuarine function to up to

17.1 ac. within Gannon Slough and its tributaries and restore historical connectivity between fringe tidal channels at the transition between tidal and non-tidal lands (affecting approximately 15.9 ac.). The project will also restore 15.3 ac. of tidal habitat and channels associated with the Jacoby Creek Estuary by constructing a new connecting channel between Jacoby Creek and South Gannon Slough (0.4 ac.) to restore an historical tidal channel, provide hydrologic connectivity during flood events and establish a properly functioning tidal drainage network. The Service completed a biological opinion for the project in July 2010. The Service concluded that the proposed action will improve the long-term viability of the goby population; despite possible indirect adverse effects to gobies that could occur from short-term habitat degradation due to sedimentation, scour, and soil compaction.

Summary of Project Effects

Adverse effects will be minimized through implementation of the conservation measures proposed in the project description. In addition, the project is expected to benefit the goby and its designated critical habitat in the long-term through improved tidal exchange, restoration of goby habitat through changes in salinity and water surface elevations, and a muted tide cycle and lagoon-type conditions in the lower reaches of Jacoby Creek.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this consultation because they require separate consultation pursuant to section 7 of the Act.

Cumulative effects for this action that would affect gobies would include all other in-channel creek and near-channel activities within Gannon Slough, nearby Jacoby Creek, the Route 101 Channel, and the immediate environs of Humboldt Bay. While other future restoration activities to enhance fish and wildlife habitat and other values are anticipated, none are currently in the planning and development stage to a level where effects could be considered here. As most similar actions would require Federal permits, they would be considered Federal actions subject to section 7 consultation, and therefore not considered in this consultation.

Other land uses in the watershed outside the action area have the potential to adversely affect aquatic habitat and water quality in the action area. Much of the watersheds of Gannon Slough, Jacoby Creek, the Route 101 Channel, and their tributary streams are either urbanized or is designated as Timber Production Zone. As such, these land uses have the potential to alter sediment delivery, increase the amplitude of flood flows, increase water temperature, and increase the pollutant load through creation of impervious surface, mass wasting, and reduction in streamside vegetation. Effects of these actions cannot be measured at this time, since their timing, location, and extent cannot currently be predicted. However, these activities may need to consider downstream effects to gobies during future planning and permitting.

CONCLUSION

After reviewing the current status of the tidewater goby, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Route 101 Eureka-Arcata Corridor Improvement Project, in Humboldt County, California, as proposed, is not likely to jeopardize the continued existence of the goby and is not likely to destroy or adversely modify critical habitat.

The Service reached the non-jeopardy conclusion based on the following:

1. The small spatial scale of potential project effects in relation to the current population distribution of the species in the Humboldt Bay area and in the recovery unit.
2. The short-term nature of most potential effects on goby numbers and reproduction during the 25-week construction period.
3. The potential for natural restoration of the affected goby population soon after project completion.
4. The conservation measures incorporated into the project to avoid and minimize adverse effects on goby numbers, distribution, and reproduction.

The Service reached the no adverse modification conclusion based on the following:

1. Placement of fish-friendly tide gates at four locations within the action area is expected to result in beneficial effects to the goby by re-establishing historical connectivity between tidal and non-tidal lands and improving the quality of critical habitat PCEs in areas above the new tide gates; aiding in the recovery of the species.

2. Within the action area, only 0.044 ac. of designated critical habitat for the goby will likely be altered; which represents 0.05 percent of critical habitat in the action area and less than 0.003 percent of the total area of critical habitat designated for the goby in Humboldt Bay (North Coast Recovery Unit, Sub-Unit NC3). The impacts to designated critical habitat within the action area will also be of short duration and should recover soon after the new SB Jacoby Creek Bridge is installed.

INCIDENTAL TAKE STATEMENT

INTRODUCTION

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the taking of endangered and threatened species, respectively, without special exemption. The term "take" is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct." Harm is further defined (50 CFR 17.3) by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding,

or sheltering. Harass is defined by the Service (50 CFR 17.3) as an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as "take" that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), "taking" that is incidental to and not intended as part of the agency action is not considered to be prohibited "taking" under the Act provided that such "taking" is in compliance with this Incidental Take Statement.

This Incidental Take Statement assumes that the project will be implemented as described in the biological assessment, which has been included by reference in the preceding Biological Opinion. Measures included in that biological assessment and in the description of the Proposed Action of this biological opinion that reduce or minimize the risk of incidental take of gobies are considered non-discretionary by the Service in its development of this Incidental Take Statement, and must be implemented as described.

The measures described below are non-discretionary, and must be undertaken by the Federal Highway Administration (FHWA) so that they become binding conditions of any grant or permit issued to an applicant, as appropriate, for the exemption in section 7(o)(2) to apply. FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If FHWA (1) fails to assume and implement the terms and conditions or (2) fails to require an applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, FHWA must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The Service anticipates that incidental take of gobies will occur as a result of the proposed action. However, it is difficult to estimate the number of gobies that could be "taken" by the action due to seasonal changes in goby distribution and abundance and because of the variability of environmental conditions. Project-level goby surveys are generally used only to determine whether gobies occur within the action area, because estimates of goby density can vary greatly by sampling method, location within a site, vegetation, and substrate (U. S. Fish and Wildlife Service 2005b). Consequently, anticipating the precise number of gobies that may be taken as a result of the proposed action is difficult. We based the anticipated amount of take on a recent survey effort and resulting density estimate from similar nearby occupied breeding habitat in McDaniel Slough.

The Service anticipates that:

Twenty adult gobies and 20 nest burrows with eggs or young could be taken in the form of harm due to injury or death from construction workers walking in the wetted channel of Jacoby Creek during demolition of the old SB Jacoby Creek Bridge over a 25-week construction period. This is based on an estimated 20 instances where construction workers will be required to walk in the

wetted channel of Jacoby Creek within the vicinity of the SB Jacoby Creek Bridge to install, maintain, and remove the bridge and pier removal debris containment systems for demolition of the SB Jacoby Creek Bridge, and an estimated density of approximately one adult goby within the 0.044 ac. of occupied\critical habitat in the immediate vicinity of the old SB Jacoby Creek Bridge. It is presumed that once a goby or goby nest burrow is "taken" a new adult goby will move into the impact area to fill the unoccupied habitat and then will in turn be "taken" when workers reenter the wetted channel.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the tidewater goby, or destruction or adverse modification of critical habitat for the tidewater goby.

REASONABLE AND PRUDENT MEASURES

The Service believes the following Reasonable and Prudent Measure is necessary and appropriate to minimize the impact of incidental take on the goby:

1. Minimize and/or avoid harm, injury, mortality, and harassment of gobies during and as a result of the proposed action, especially during bridge construction and demolition activities in Jacoby Creek.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, FHWA must comply with the following term and condition, which implements the reasonable and prudent measure described above. This term and condition is nondiscretionary.

1. To implement the Reasonable and Prudent Measure, FHWA shall fully implement the conservation measures as described in the Description of the Proposed Action/ Conservation Measures sections of the preceding Biological Opinion.

The reasonable and prudent measures with their implementing terms and conditions are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If during the course of the action, the level of incidental take is exceeded; such incidental take represents new information requiring reinitiation of consultation and review of the need to include reasonable and prudent measures. The FHWA must immediately provide an explanation of the causes of the taking and review with the Service the need for possible inclusion of reasonable and prudent measures.

MONITORING REQUIREMENTS

In order to monitor the impacts of incidental take, FHWA must report the progress of the action and its impacts on the species to the Service, as specified below:

1. The FHWA will provide a biological monitor that shall be present during bridge demolition activities that require construction workers to access the wetted channel of Jacoby Creek. The monitor will ensure that workers limit access to the wetted channel to that required only to install, maintain, and remove the demolition and pier removal debris containment systems in the immediate vicinity of the SB Jacoby Creek Bridge as described in this biological opinion.

2. The FHWA will provide a biological monitor that shall be present during installation of the visual barrier fences; paralleling both banks of Jacoby Creek in the vicinity of the two bridges. The monitor will also periodically check that the structural integrity of the fences is maintained throughout the construction period. The monitor will also ensure that the footbridge crossing Jacoby Creek— to reduce the incidence of workers walking across the wetted channel—is properly installed (*i.e.*, no portion of bridge in the wetted channel) and maintained throughout the construction period.

3. By December 31 of each calendar year, the FHWA will ensure the Service receives the results of monitoring efforts at the Jacoby Creek construction site.

REPORTING REQUIREMENTS

Upon locating a dead or injured tidewater goby, the Service's Division of Law Enforcement in Sacramento, California at (916) 414–6660 and the Arcata Fish and Wildlife Office at (707) 822–7201 must be notified immediately; and in writing within three working days. Notification must include the date, time, and location of the carcass; cause of death or injury, if known; and any other pertinent information. Care must be taken in handling injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state for later analysis of cause of death. The finder has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed, unless to remove it from the path of further harm or destruction. Should any treated listed species survive, the Service shall be contacted regarding the final disposition of the specimen(s). In the case of take or suspected take of tidewater gobies not exempted in this biological opinion, the Arcata Fish and Wildlife Office and the Division of Law Enforcement shall be notified within 24 hours of the incident.

COORDINATION OF INCIDENTAL TAKE WITH OTHER LAWS, REGULATIONS, AND POLICIES

The incidental take statement provided in this biological opinion satisfies the requirements of the Act. The Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions, including the amount and/or number specified herein.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Endangered Species Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as to preserve endangered species habitat, to help implement recovery plans, or to development information. The Service provides the following conservation recommendations that FHWA may wish to consider in the final planning of this action, and in the planning of similar future actions.

1. Future habitat restoration and listed species recovery activities in and adjacent to the action area will require careful management of tidal flows and hydrologic conditions within channels influenced by Caltrans' tide gates. FHWA should work with the Service during the design and installation of fish-friendly tide gates to be installed on the Route 101 Channel, the Old Jacoby Creek Channel, Gannon Slough, and Brainard Slough. These tide gates should be designed and installed to meet multiple present and future objectives for fish passage and water quality, including but not limited to:

    a. Provide fish passage as appropriate and feasible within the four channels where fish are present. Fish passage should accommodate native fish species and their life stages that may be present in the channels, specifically including the goby.

    b. Allow for future restoration activities occurring in the watersheds draining to the tide gates, including accommodation of future muted tidal flows to meet restoration needs for appropriate tidal exchange.

2. FHWA should work with the Service to ensure the development and implementation of an adaptive management strategy for operation of the newly installed, fish-friendly tide gates at the Route 101 Channel, the Old Jacoby Creek Channel, Gannon Slough, and Brainard Slough to ensure short-term and long-term persistence of goby and other native fish populations in these water bodies. This management strategy should be developed in cooperation with the National Marine Fisheries Service, the California Department of Fish and Game, and other interested agencies and partners. This adaptive management strategy should include consideration of multiple management objectives, including:

    a. Management of dense cattails in the Route 101 Channel that reduce habitat quality for aquatic life and cause water backup and flooding of adjacent landowners. Management of the tide gates, including the degree of muted tidal cycles, has the potential to eliminate this ongoing maintenance problem.

    b. A muted tidal cycle, consistent with the above adaptive management goal, can result in improved quality and extent of habitat for gobies and other brackish water species by creating favorable hydrologic conditions in the Route 101 Channel.

    c. Creation of a muted tidal cycle at the Old Jacoby Creek Channel can improve water quality and potential tidewater goby habitat at that site.

d. Maintain existing water quality and tidal exchange conditions in Gannon Slough, with the flexibility to increase tidal exchange in the Gannon Slough channel above the tide gates to accommodate future restoration activities, as may be needed.

REINTIATION NOTICE

This concludes reinitiated formal consultation on the proposed Eureka-Arcata Corridor Improvement Project. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operation causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion, please contact Gregory Schmidt of my staff at (707) 825–5103.

Sincerely,

Nancy J. Finley
Field Supervisor

cc:
Caltrans District 1, Eureka, California (Attn: Gail Popham)
Caltrans District 1, Eureka (Attn: Gary Berrigan)
California Dept. of Fish and Game, Eureka (Attn: Michael van Hattem)
National Marine Fisheries Service, Arcata (Attn: Kasey Sirkin)
California Coastal Commission, Eureka (Attn: Robert Merrill)
Environmental Protection Agency, San Francisco (Attn: Carolyn Mulvihill)

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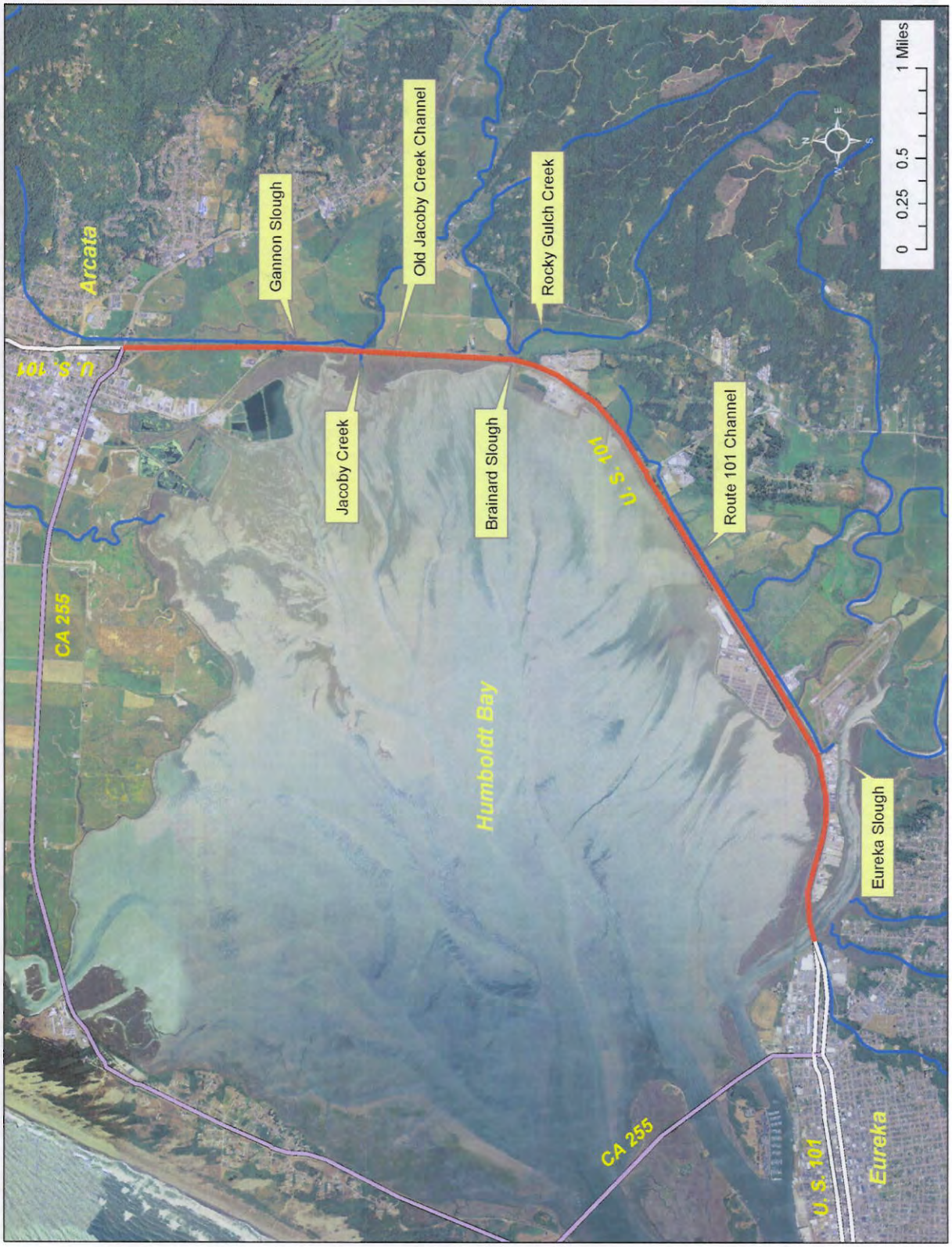

Figure 1. Eureka-Arcata Corridor Improvement Project Action Area (red segment of U. S. Route 101).

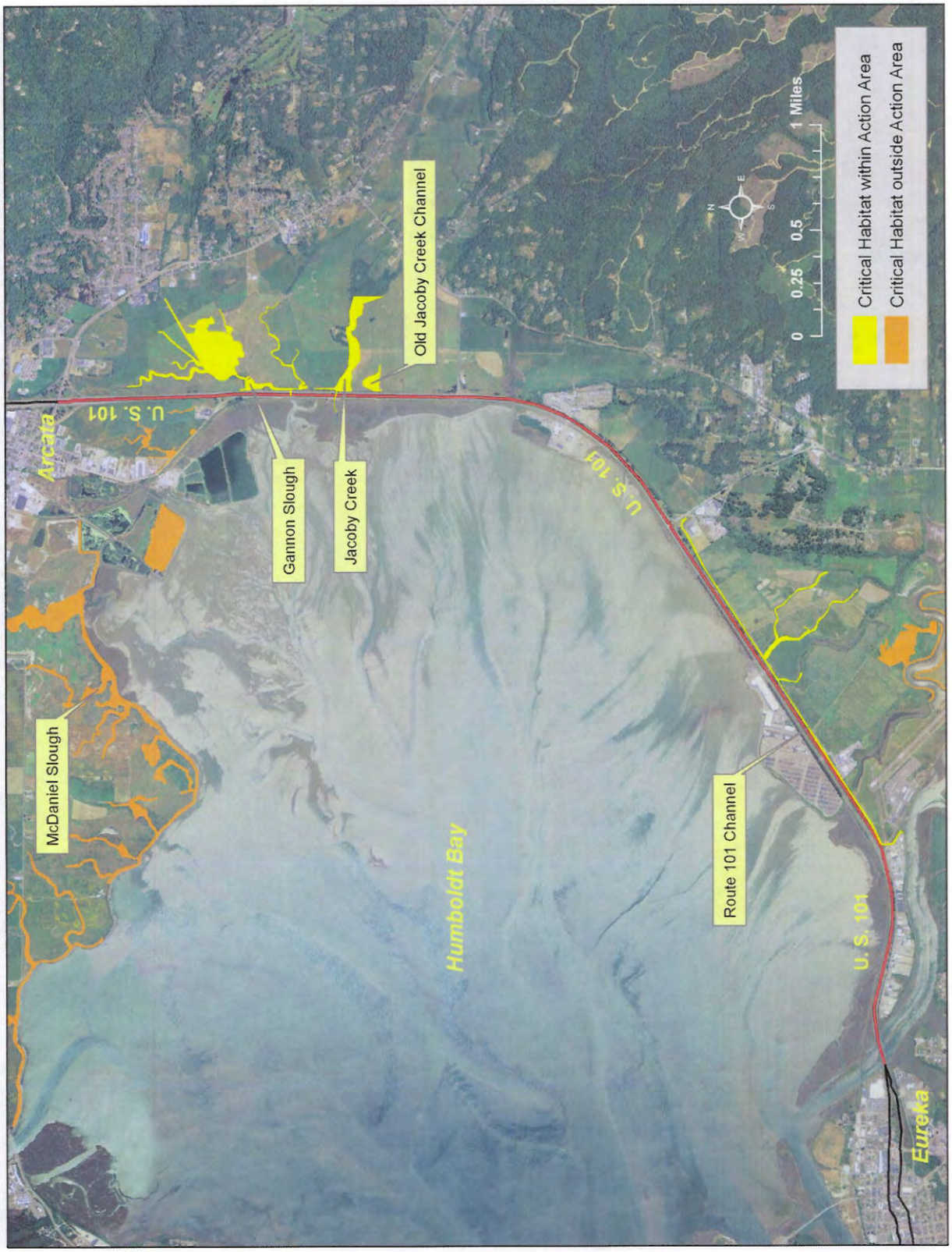

Figure 2. Designated tidewater goby critical habitat within the action area.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

APR 29 2016

Refer to NMFS No: WCR-2016-4581

Steve Croteau
Senior Environmental Planner
California Department of Transportation, District 1
P.O. Box 3700
Eureka, California 95501

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Eureka Arcata Route 101Corridor Improvement Project, Humboldt County, California

Dear Mr. Croteau,

On February 17, 2016, NOAA's National Marine Fisheries Service (NMFS) received your request for written concurrence that Caltrans' proposed Eureka-Arcata Route 101 Corridor Improvement Project (Project) is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA) of 1973, as amended (16U.S.C. § 1531 *et seq.*). An April 24, 2002, letter from Federal Highway Administration (FHWA) designated Caltrans as the non-Federal representative for informal ESA consultations pertaining to most Caltrans projects. In a January 21, 2016 letter to NMFS, FHWA affirmed their designation of Caltrans as the non-federal representative for the Project. This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.

Accompanying the request, Caltrans provided NMFS a Biological Assessment (BA) and Essential Fish Habitat Assessment (EFHA) dated February 1, 2016. The BA and EFHA cite and incorporate by reference many documents. Since February 17, 2016, during the course of informal consultation, NMFS received additional information via electronic mail from Caltrans which clarifies or supersedes information presented in the BA.

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination you made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 60.920, and agency guidance for use of the ESA consultation process to complete EFH consultation. Caltrans has determined that the proposed action may adversely affect EFH for Pacific coast salmon, Pacific groundfish, and coastal pelagic species.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section

515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). A copy of this concurrence letter will be available on the Public Consultation Tracking System, https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts. A complete record of this consultation is on file at the NMFS Northern California office in Arcata, California.

Proposed Action and Action Area

The following description of the proposed action and action area relies entirely on information contained within Caltrans' February 1, 2016 BA and EFHA, and subsequent information provided by Caltrans. For ease, tables and appendices contained in the BA are hereby incorporated by reference to this letter, and retain the same numbering.

Proposed Action

The FHWA proposes to authorize, and fund a portion of the Eureka-Arcata Route 101 Corridor Improvement Project. The Project includes safety and operation improvements to 6.43 miles along the Route 101 corridor between Eureka (PM 79.9) and Arcata (PM 86.33), California, as well as wetland restoration on the 78-acre Lanphere parcel and combined 80-acre Samoa parcels situated in the northern margin of Humboldt Bay. See Attachment 1 for a map delineating the project area and action area. The Project is expected to take up to three years beginning in 2018. Information about the construction sequence or schedule can be found in Attachment 2. Certain best management practices or measures will be applied to avoid or minimize potential negative effects of the action, including limited operating periods, erosion control, and revegetation. Project elements include: (1) Replacement of the Southbound Jacoby Creek Bridge; (2) Bridge Rail Upgrades at Jacoby Creek and Gannon Slough Bridges; (3); Roadway Work, including: interchange at Indianola Cutoff; extension and widening of deceleration/acceleration lanes; additional northbound lane at Airport Road to Mid-City Motor World; road realignment and drainage modification at Jacobs Avenue/Airport Road intersection; half signal at Airport Road; close median crossings; shoulders and curbs; guardrail and cable rail safety barrier; paving; addition or replacement of roadway lighting; vegetation removal for clear recovery zone; and removal of safety corridor signage; (4) Tide Gate Replacement and Rock Weir Construction; (5) Project Operations and Maintenance; (6) Wetland Restoration; and (7) Avoidance, Minimization and Conservation Measures.

1. **Replacement of the Southbound Jacoby Creek Bridge.**

The existing 73-foot-long southbound (SB) Jacoby Creek Bridge will be replaced with a new bridge that is 86 feet long and 42.33 feet wide (3.33 feet wider; and approximately 100 square feet more surface area and shade). The new bridge will be single span with no piers in the channel, unlike the current bridge which is a three-span structure. The new bridge will be constructed at a deck elevation approximately two feet higher than the existing bridge elevation.

Construction of the detour will involve the removal of approximately 0.05 acre of riparian vegetation within the highway median, including four large, non-native Monterey pine (*Pinus radiata*) trees (diameter at breast height [dbh] 30–61 inches). The detour bridge approaches will require temporary (two years) paving in approximately 0.4 acre of wetland.

The SB lanes at Jacoby Creek will be temporarily realigned to allow for the replacement of the bridge. The new bridge will be erected to the east of the current alignment in the existing median to first serve as a temporary detour bridge, and later, after the old bridge is removed, moved into place using the jack-and-slide method. Elements of construction and demolition of the SB Jacoby Creek Bridge are described in further detail below:

Construction of the Detour Bridge
In the median on both sides of Jacoby Creek, two areas (each about 50 feet long, 8 feet wide and 4 feet deep) will be excavated east of the existing bridge for the temporary detour bridge abutments. All excavated material will be contained to prevent sediments from entering waterways, or the excavated material may be placed directly into dump trucks and carried to an approved disposal site. These excavations will be above the ordinary high water level (OHWL), avoiding the water of the active, wetted Jacoby Creek channel and associated emergent vegetation; however, water is expected to enter the excavated areas, therefore dewatering or seepage prevention will be required.

Within the excavated areas on either side of the channel, six or eight 36-inch diameter cast-in-place-steel shell (CISS) piles will be installed (three or four on each bank) by oscillation, vibration or rotation approximately 15 to 20 feet from the wetted channel. Pile installation for the detour bridge will take approximately six hours per day over the course of two days in Year 1 of construction. The piles will be set approximately 100 feet deep. All pile driving equipment will be staged outside of the banks of Jacoby Creek. Soil will be removed from inside the upper section of the CISS piles and filled with reinforced concrete. After the piles are installed, pile caps will be constructed to form the abutment footings. A temporary concrete washout facility will be placed on-site for concrete clean up. Construction of the abutments will take approximately one to two months to complete during the summer of the first year of construction.

The new bridge deck will be pre-cast box sections transported to the site and lowered into place by a crane. The sections will be bolted together and then capped or bonded with a concrete surface. Bridge rails will then be installed. Temporary fill will be placed for the detour bridge approaches and paved, and then SB traffic will then be diverted to the new bridge.

Demolition of the Existing Jacoby Creek Bridge
Once the new bridge is operational, the old bridge will be demolished. The contractor will be required to submit a demolition plan to be approved by the Caltrans resident engineer to describe methods and measures to be taken to restrict or minimize construction debris from entering the creek channel prior to demolition.

Prior to demolition, a debris containment system will be installed per the approved demolition plan. Temporary containment could be mounted to either the existing bridge support piles or placed on the banks of the creek outside of the wetted channel to allow for removal of the bridge rails, concrete deck, and beams while minimizing the possibility for debris to enter the creek channel.

Once the containment system is in place, the bridge rails will be removed with a small hoe-ram, jackhammers or concrete saws. Then the deck and beams be taken out in pieces from above using a crane or excavator. The pile caps supporting the existing bridge deck will then be removed similar to the deck removal. Debris will be removed from the debris containment system as demolition work proceeds. All concrete debris will be moved outside of the project limits to be recycled or disposed at an approved disposal site.

Twelve of the existing bridge piers (a row of six piers on either side of the channel) are situated above the water line on the bank of Jacoby Creek and their removal will not impact the creek channel. These piers will be cut off at an elevation sufficiently low enough to accommodate the new bridge and foundation (approximately four feet below the existing roadway elevation). Twelve remaining piers are in the water even at low tide, and their removal will require in-stream work. To ensure that all minimization and avoidance measures are implemented, a biological monitor will be present during all in-stream activities associated with the removal of existing SB Jacoby Creek Bridge and piers.

The twelve piers within the channel will be removed above the waterline of the creek during low tide (avoiding any need for excavation or isolation casing) to minimize turbidity. This will be accomplished by tightly wrapping containment material (high density polyethylene [HDPE] sheets to control dust and debris from entering the creek) to the piers below the waterline, then using a concrete saw or pneumatic/hydraulic hammer to cut the piers above the waterline. The cut piers will be tethered to an excavator or crane operating from outside the channel, then removed and placed outside the channel. Pier removal would take approximately two weeks to complete. After the demolition and removal of all of the structural elements of the bridge, the debris containment system will be removed.

Construction of New Bridge Abutments and Final Bridge Alignment

In the excavated areas of the old abutments, new abutments will be extended to the west along both banks of Jacoby Creek from the detour bridge abutments. Six to eight CISS piles (three or four on each side of Jacoby Creek) will be installed on the banks about 15 to 20 feet from the wetted channel for the abutments of the new bridge. The piles will be driven to specified depths (less than 100 feet deep) using a vibratory or oscillating pile driver. Water is expected to enter the excavated areas, therefore dewatering or seepage prevention will be required. Reinforcing and concrete will be placed within the steel shell. The abutments and pile caps will be formed, reinforcing placed, and concrete poured. A temporary concrete washout facility will be placed on-site for concrete clean up, and all pile driving equipment will be staged outside the banks of Jacoby Creek.

The SB roadway will be closed for one night. Using the jack-and-slide method, the new bridge will be moved approximately 52 feet west to the original alignment with the highway. The bridge will be paved and striped, and traffic will be re-routed.

Once the new bridge is operational, the remaining asphalt surface of the detour bridge will be removed and properly disposed of or recycled outside the project limits. The fill placed for the detour will be contoured to the pre-construction slopes within the median. The finished surface will be seeded with a California native seed mix and non-persistent cereal grain for erosion

control. Once the area is stabilized, silt fences or other temporary BMP systems utilized to prevent construction debris or sediment from entering Jacoby Creek will be removed. The abutments of the detour bridge will remain in place. The abutments will be covered with topsoil and planted.

2. Bridge Rail Upgrades at Jacoby Creek and Gannon Slough Bridges.

The existing NB Jacoby Creek and NB Gannon Slough bridges are approximately 74.5 feet long and 76.5 feet long, respectively, and 39 feet wide. The bridges consist of reinforced concrete slabs resting on reinforced concrete pile caps on concrete piles. There are four bents in total for the NB Jacoby Creek Bridge and five for the NB Gannon Slough Bridge.

The new bridge rails will be cantilevered from the existing bridges, requiring no piers within the watercourses. A containment system will be placed along the edges of the bridges to keep foreign materials from entering the watercourses during construction. Construction of the bridge rails will be performed from the roadway; however, workers may need to walk on the bed, bank or channel of the watercourses to install and remove the debris containments system.

Both bridges will be widened approximately 16 inches (8 inches on each side of the bridges) to accommodate the new bridge rails. Lightweight, steel tubular railing will be placed behind and above the new bridge rail to meet standard height requirements for bicycle and pedestrian use. The wider bridge configurations will shade approximately an additional 75 square feet of Gannon Slough and additional 50 square feet of Jacoby Creek.

3. Roadway Work.

Roadway work includes construction of an interchange at the Indianola Cutoff Route 101 intersection, extension and spot widening of deceleration and acceleration lanes, an additional NB lane from Airport Road to Mid-City Motor World, road realignment and drainage modification at the intersection of Jacobs Avenue and Airport Road, a half-signal at Airport Road, closure of median crossings, construction of shoulders and curbs, paving, addition and/or replacement of roadway lighting, installation of cable rail safety barrier and guard rail reconstruction, vegetation removal for establishment of a Clear Recovery Zone (CRZ), and removal of Safety Corridor signage.

Roadway improvements will result in approximately 6.4 acres (net) of new impervious surface within the action area. More than three acres of this new impervious surface is for the Indianola Interchange, with the remainder resulting from extension and spot widening of acceleration/deceleration lanes, minor road realignments and curve adjustments, and a concrete pad for median cable rail barrier. Approximately 5.25 acres of the estimated new impervious surface will be asphalt for new pavement, with the remaining 1.15 acres consisting of concrete for the cable rail pad.

Interchange at Indianola Cutoff

The compact diamond interchange (undercrossing) will consist of elevating Route 101 by up to 25 feet above the existing highway, and will have separate NB and SB bridges crossing Indianola Cutoff. Indianola Cutoff will maintain its present alignment and grade. The longitudinal distance impacted by construction of the Interchange is approximately 2,000 feet on both sides of Indianola Cutoff, for a total length of approximately 4,000 feet. The width of impact will be from the limits of shoulder backing west of SB Route 101 to approximately 20 feet from the top of slope along the existing ditch to the east of Route 101. The bridge crossing Indianola Cutoff will be a single span box type structure approximately 110 feet in length, 93 feet-4 inches wide, and approximately five feet in depth. The bridge will be supported by CISS piles of a depth to be determined, but could extend approximately 100 feet below existing grade. A fill slope of approximately 1.5:1 will be placed between the bridge abutments and the roadway of Indianola Cutoff. Retaining walls will be placed within the fill slopes to provide a wider view for traffic on Indianola Cutoff. Fill slopes elsewhere within the interchange will be up to 1.5:1 to minimize impacts to wetlands. The median width will be reduced to 22 feet at the interchange, requiring median barriers, and the median within the interchange area will be paved.

No geotechnical work (drilling) has been performed at this location to date (June 29, 2015) and will need to be performed prior to determining the earthwork placement, de-watering, and pile driving depth requirements. However, design has assumed that the placement of vertical drains at locations of fill will be required to accelerate the settlement process under the added fill material over bay muds. Fill material will be from a clean, commercial source. Some embankment material will be placed prior to installation of the vertical drains to ensure the water removed will flow to “daylight”. Approximately one foot of permeable rock will be placed over the embankment material. A preliminary estimate for the vertical drains is a spacing of six feet with a depth of 50 feet. The vertical drains will be installed to drain into the permeable rock layer where water will be allowed to flow out of the fill overland to existing drainage ditches. Vertical drains are installed with a truck or excavator mounted mandrel hydraulically driven into the ground, and leaving in its place a synthetic drain that will allow water to drain to the permeable layer as pore pressure in the underlying soils is increased due to placing fill.

The construction of the interchange will require staged construction. During construction, existing turning movements at Indianola Cutoff will be perpetuated until the completion of the interchange.

Construction Sequence of the Indianola Cutoff Interchange:

1. Place fill within median adjacent to SB Route 101 for the length of the interchange construction limits (~PMs 82.3/83.1). Place base and paving for the realignment of NB Route 101 within median. Place Temporary Type K railing between the temporary NB alignment and the existing SB lanes. The temporary alignment will have a median width of approximately 14 feet from NB edge of traveled way to SB acceleration lane edge of traveled way. Generally, SB left turns will be accommodated to and from Indianola Cutoff during the construction of the interchange.
2. Realign NB traffic to the temporary alignment within the median.
3. Place an initial (approximately) two to four feet of fill within the east half of the interchange to be constructed.

4. Place vertical drains at locations receiving more than six feet of fill on a six-foot grid pattern for the NB half of interchange.
5. Place a layer of geotextile fabric on the fill, then place drain rock over this area and another layer of geotextile fabric over the drain rock.
6. Place fill to approximately the finished grade of NB Route 101 and fill forming the NB ramps for the Indianola Cutoff Interchange. The fill will be monitored for compaction and for settlement prior to paving.
7. Trench and place conduit and lighting foundations, electrical equipment, poles, and lights for NB half of interchange and ramps.
8. Place erosion control and seeding, shrubs, and trees on finished fill slopes of NB half of interchange.
9. Drive steel shell bridge abutment piles for each end of the NB half of the interchange. Piles will likely be between 24 inches and 36 inches in diameter. Also drive steel shell piles to support lower retaining walls under the bridge.
10. Remove the material from within the steel shells, place reinforcing steel and concrete into the steel shell piles.
11. Place forms and reinforcing steel to form the abutments for the NB half of the bridge and the footings for the lower retaining walls under the bridge.
12. Pour concrete forming the bridge abutments and lower retaining wall footings.
13. Place falsework forms across Indianola Cutoff to form the soffit for the NB half of the bridge.
14. Place reinforcing and concrete soffit of the box bridge.
15. Place forms and reinforcing steel for the vertical interior and east box structure walls of the NB half of the bridge. Then place the concrete and remove the wall forms.
16. Place falsework to form the finished deck of the NB half of the bridge.
17. Place reinforcing and concrete of the deck of the NB half of the bridge.
18. Form and place steel bridge rail along the east edge of the bridge.
19. As settlement will have occurred for the fill placed for the interchange, add or remove fill as required to meet finish grades of NB Route 101, and place aggregate base and asphalt pavement for the NB ramps and NB Route 101.
20. Place temporary railing (Type K) along median shoulder of bridge.
21. Relocate NB traffic to newly constructed NB undercrossing.
22. Place vertical drains at locations receiving more than six feet of fill for SB half of interchange.
23. Place geotextile fabric, drain rock, fill, and construct SB half of undercrossing per numbers 4 through 19 described above for the NB half of the undercrossing.
24. Construct concrete median barrier and install guardrail transition rails and terminal systems within the median of Route 101 in the area of the interchange.
25. Realign SB traffic to the newly constructed SB half of the newly constructed SB lanes of the interchange.
26. Remove paving of the existing SB lanes to reduce the paved width to conform to the standards of ramps (24 feet wide). Place finished paved surface of SB ramps, and restripe accordingly.

Extension and Spot Widening of Deceleration/Acceleration Lanes
The existing acceleration/deceleration lanes within the project limits do not meet current traffic design standards. Right-side acceleration and deceleration lanes will be extended at the following Route 101 intersections: Cole Avenue, Mid-City Motor World, California Redwood Company, Bracut Industrial Park, Resale Lumber/Bracut Maintenance Yard, and Bayside Cutoff, listed south to north in Table 3.1. All acceleration and deceleration lanes will have a minimum of 4-foot wide shoulders.

Table 3.1. Proposed Right-Turn Acceleration and Deceleration Lane Work Locations.

Route 101 Intersection	PM	Description
Cole Avenue	80.25	Extend NB deceleration lane to Cole Avenue by 400 feet.
Mid-City Motor World	81.35	Extend NB acceleration lane from Mid-City Motor World to 800 feet and extend deceleration lane to Mid-City Motor World from Route 101 to 800 feet.
California Redwood Company	81.84	Extend SB acceleration lane onto Route 101 by 550 feet and extend SB deceleration lane from Route 101 to California Redwood Company entrance to 800 feet by realigning the SB Route 101 lanes into the median.
Bracut Industrial Park	83.38	Extend both the SB acceleration lane onto Route 101 and the SB deceleration lane approaching the Bracut Industrial Park by 800 feet.
Resale Lumber and Bracut Maintenance Yard	83.38	Extend both the NB acceleration lane onto Route 101 and the NB deceleration lane approaching Bracut Maintenance Yard/Resale Lumber by 550 feet.
Bayside Cutoff	83.92	Extend NB acceleration lane onto Route 101 to 800 feet and extend deceleration lane from Route 101 to Bayside Cutoff to 800 feet.

Lane extension and spot widening will involve over-excavation and removal of material for the acceleration and deceleration lane pavement structural section, placement and compaction of base material, and paving. Over-excavated material will be utilized in fill locations, but could be stockpiled temporarily within the project limits such as the Indianola Cutoff intersection where it will ultimately be placed for construction of the interchange.

To lengthen the deceleration/acceleration lanes at the entrance to California Redwood Company, the SB lanes will be realigned/widened approximately eight feet toward the median to minimize impacts to wetlands and other waters of the U.S., and to avoid the removal of approximately 200 to 300 large (dbh 18 to 36 inches) blue gum eucalyptus (*Eucalyptus globulus*) trees on the right SB shoulder.

Additional Northbound Lane - Airport Road to Mid-city Motor World
A third NB lane will be added toward the median, extending 400 feet south of the Airport Road Intersection to Mid-City Motor World, for a total three lane segment length of 3,000 feet. The

additional lane is required to ensure vehicles have adequate distance to merge to two lanes and an auxiliary-right-turn-only lane at Mid-City Motor World. Fill will be placed within the median adjacent to the NB lane from PM 80.75 to PM 81.2 to accommodate the third lane and then paved.

Road Realignment and Drainage Modification at Jacobs Avenue / Airport road Intersection

The intersection of Jacobs Avenue and Airport Road will be widened to accommodate egress and access with Route 101. Widening of the intersection will require the relocation of a fire hydrant and joint utility pole and anchor to the east side of Jacobs Avenue. A 150-foot long by 4-foot wide roadside drainage will be realigned. The current drainage flows approximately 50 feet through a 24-inch concrete pipe under Jacobs Avenue. Currently, the remaining 100 feet of drainage is an open ditch along the Airport Road shoulder. The 100-foot section of open ditch will be eliminated and realigned into a 130-foot long, 24-inch diameter culvert. A retaining wall will be placed adjacent to the widened intersection. The wall will be a Type 1A standard cantilevered concrete retaining wall with Type 742 concrete barrier accommodating a 4-foot wide paved shoulder. The wall will be approximately 100 feet long and up to six feet in height.

Half Signal at Airport Road

A half signal will be constructed at the Airport Road Intersection with Route 101. The half signal will operate such that NB traffic will have signal control to allow for left turns from Airport Road/Jacobs Avenue to SB Route 101, and left turns from SB Route 101 to Airport Road/Jacobs Avenue where SB mainline traffic will not be stopped. Trenching or directionally drilling will be performed at the intersection of Route 101 and Airport Road for electrical services and signal and lighting systems.

Close Median Crossings

Median crossings will be closed at Mid-City Motor World, California Redwood Company, Bracut Industrial Park, and Bayside Cutoff. The median will remain open at Airport Road where the half signal will be installed. Work will consist of saw cutting the pavement at these locations, removal of the pavement and base rock, placing topsoil and re-seeding the median crossings to prevent their use by motorists. Pavement will be removed by cold planing, using a machine that deposits grindings directly into a truck, which are then hauled away for disposal or recycling. Approximately 1.23 acres of existing impervious surface will be removed from the action area with the closure of medians. This acreage is accounted for in the net impervious surface estimate for pavement calculated in Table 3.2 below.

Shoulders and Curbs

The existing curb and asphalt-concrete shoulder will be replaced with eight-foot wide paved shoulders at the Route 101/255 interchange and South G Street ramp.

Guardrail and Cable Rail Safety Barrier

Cable rail safety barrier with a four-foot wide concrete pad will be installed in the median between the Eureka Slough bridges and Airport Road, and from South G Street to the 11th Street overcrossing in Arcata to replace existing thrie-beam guardrail at that location. At five locations within the corridor (*see* PMs 81.31, 81.36, 81.75, 81.84 and 85.82 in Appendix II), existing metal

beam guardrail (MBGR) will be reconstructed to meet current design standards by replacing it with the Midwest Guardrail System or MGS. In addition, new MGS guardrail with the appropriate end treatments will be installed at three locations to shield existing billboards along the SB shoulder of Route 101 (south of the Bracut Industrial Park) to protect errant vehicles from striking these fixed objects (*see* PMs 83.0, 83.13, and 83.31 in Appendix II). The billboards are outside of the state right of way (ROW), but are within the 30-foot clear recovery zone. All other safety barriers will be installed within the state ROW.

The four-foot concrete pad for the cable rail safety barrier will contribute an additional 1.15 acres of impervious surface within the action area, all within the Gannon Slough watershed.

Paving

Overlay paving of the existing road surface from the Eureka Slough bridges to the 11th Street overcrossing in Arcata was performed in 2013 and 2014 under a Capital Preventative Maintenance project and is no longer part of the proposed action. Paving performed for the proposed action will be conducted where acceleration and deceleration lanes are widened and/or extended, at the Indianola Interchange and new SB Jacoby Creek Bridge, and median shoulders in Arcata between South G Street and the 11th Street overcrossing where shoulders will be widened to conform to standard widths. Paving will also occur for the temporary detours at the Indianola Interchange and the SB Jacoby Creek Bridge while those features are being constructed.

The type of pavement used will be the same type as the existing pavement within the action area (i.e., dense-grade hot mix asphalt with an overlay of open-graded friction course to improve traction in wet weather). Shoulder backing consisting of clean gravel will be placed at a minimum of three-feet wide adjacent to the paved surfaces to create a smooth transition from road surface to adjacent ground.

The additional paving will increase impervious surface by approximately 6.4 acres (approximately 7.3 percent increase). This acreage accounts for existing impervious surface that will be removed with closure and restoration of highway medians. An additional 0.3 acres will be temporarily paved (up to two years) for the detour that bypasses the SB Jacoby Creek Bridge while it is being replaced. The paved temporary detour at the Indianola Interchange will be incorporated into the roadway (i.e., buried by the interchange).

Pre- and post-project impervious surface estimates are shown in Table 3.2. In some sections, there is a reduction of impervious surface due to median closure and rehabilitation. Approximately 3.46 acres of the new pavement will be within the Jacoby Creek and Freshwater Creek watersheds (combined), and the remaining 1.79 acres of new pavement will be within the Gannon Slough drainage area (Beith, Campbell and Grotzman Creek watersheds).

Table 3.2. Paved Surfaces within the Project Limits (Approximate Acres).

Section of Highway and Associated Drainage	Existing	Proposed	Change
Eureka Slough to Cole Avenue (Jacobs Avenue ditch)	3.03	2.83	-0.20
Cole Avenue to Bracut -- includes Airport Avenue Intersection and the Indianola Interchange (The 101 Slough)	32.19	35.87	+3.68
Bracut to Bayside Cutoff (Brainard Slough)	5.71	5.72	+0.01
Bayside to Jacoby Creek (Old Jacoby Creek)	5.63	5.60	-0.03
Jacoby Creek to Arcata (Gannon Slough)	25.38	27.17	+1.79
Totals	71.94	77.19	**5.25**
Total Percent Increase Due to Paving	**N/A**	**N/A**	**7.3 %**

Addition and/or Replacement of Roadway Lighting

Roadway lighting will be added or replaced on mainline Route 101 at Cole Avenue, Indianola Cutoff, Bayside Cutoff, the Route 101/255 Interchange, and the ramps at South G Street, 14th Street, and Sunset Boulevard. New electroliers (and their foundations) and electrical conduit will be installed at these locations. The locations of the new electrical conduits are not known at the time of preparation of this document. At the contractor's option, conduit will be installed by trenching, placing conduit and backfilling, or by "trenchless" directional drilling methods. No new permanent lighting will be installed within proximity of the watercourses that support fish habitat (Brainard Slough, Gannon Slough, Jacoby Creek, Old Jacoby Creek, 101 Slough, or Eureka Slough).

Vegetation Removal for Clear Recovery Zone

For traffic safety and to create space for widening of deceleration/acceleration lanes, a number of trees and shrubs will be removed from the corridor; approximately 38 trees and two shrub hedges as shown in Table 3.3, the majority of which are non-native ornamental plantings. Four large (non-native) Monterey pine trees will require removal to accommodate the temporary bridge detour in the median at Jacoby Creek. Given the riparian position of these trees, this area will be replanted with native, ecologically appropriate small tree and shrub species that meet safety and CRZ requirements once construction is complete.

Removal of Safety Corridor Signage

After project construction, existing safety corridor signage will be removed from the Eureka Slough bridges to Gannon Slough. The signs will be removed by being pulled up with equipment and backfilled with soil.

Table 3.3. Trees and Shrubs to be removed within the Route 101 Corridor

Post Mile	Species	DBH (inches)		Post Mile	Species	DBH (inches)
81.6	200 foot hedge	shrub		82.9	Monterey cypress	42
82.08	Monterey cypress	12		82.9	Monterey cypress	46
82.1	Wavy-leaf silk tassel	shrub		82.9	Shore pine	8
82.1	Blue gum eucalyptus	18		82.9	Sitka spruce	8
82.5	Monterey pine	40		82.9	Sitka spruce	8
82.58	Monterey cypress	60		82.9	Sitka spruce	8
82.61	Monterey cypress	60		83.0	150' hedge	shrub
82.7	Monterey cypress	48		83.15	Shore pine	10
82.7	Monterey cypress	40		83.17	Shore pine	10
82.7	Monterey cypress	46		83.18	Shore pine	10
82.7	Monterey cypress	18		83.3	Monterey cypress	48
82.7	Monterey cypress	49		83.3	Monterey cypress	48
82.76	Shore pine	10		83.5	California wax myrtle	shrub
82.81	Monterey cypress	48		83.75	Monterey pine	36
82.82	Monterey cypress	40		83.75	Monterey pine	24
82.82	Shore pine	8		83.75	Monterey pine	24
82.9	Monterey cypress	48		83.8	Monterey pine	36
83.95	Monterey pine	24		84.5	Monterey pine	36
84.5	Monterey pine	61		84.5	Monterey pine	30
84.5	Monterey pine	56		84.5	California wax myrtle	shrub

4. Tide Gate Replacement and Rock Weir Construction

Tide Gate Replacement

Nine tide gates at six different locations within the action area will be replaced (*see* Appendix III of the BA for a map showing the location). Included are the tide gate for Jacobs Avenue drainage at the Eureka Slough (near the NB Eureka Slough Bridge), the dual tide gates off Airport Road where the 101 Slough outlets at Eureka Slough (behind the Farm Store on Jacobs Avenue), the tide gate south of Mid-City Motor World that connects to a roadside ditch at California Redwood Company, a tide gate at Brainard Slough (north of Bracut), a tide gate at Old Jacoby Creek, and a triple tide gate at Gannon Slough (north of the NB Gannon Slough Bridge).

All of the present tide gates are the standard top-hinged flap gate design, either round or rectangular. At the locations where federally listed fish (i.e., salmonids and tidewater goby) may be present, a fish-friendly design will be installed to facilitate fish passage. The 101 Slough, Old Jacoby Creek, Brainard Slough, and Gannon Slough are locations where both gobies and

salmonids may be present and will receive a fish-friendly tide gate. Those locations where multiple tide gates are installed and fish utilize the area, only one of those will be a fish-friendly tide gate. Once installed, the fish-friendly tide gates will be adjusted to maintain existing muted tidal flow conditions to perpetuate current habitat conditions present inland of the tide gates, such as minimum and maximum water level, salinity, and water level fluctuations.

There are a number of tide gate configurations available to provide for fish passage. These include self-regulating or buoyant gate; a permanent, adjustable guillotine gate that creates a continual passage; a Muted Tide Regulator Gate; and Mitigator Fish Passage Gate. The final tide gate design selection will be determined with technical assistance requested from the NMFS, USFWS, and CDFW.

Caltrans will contract with a qualified consultant to conduct a hydraulic analysis on the other slough channels (Brainard Slough, Old Jacoby Creek and Gannon Slough) where fish-friendly tide gates will be installed prior to construction to establish existing hydraulic conditions. The consultant will monitor all tide gate flow levels and salinity for two years after the project ends to ensure existing hydrological conditions are maintained (or improved in the case of 101 Slough) within the affected channels. Caltrans maintenance will assume operation and maintenance of the tide gates after the two-year monitoring period.

The two remaining tide gate locations, the Jacobs Avenue ditch and California Redwood Company ditch, have no upstream fish habitat so these replacement gates will not have a fish-friendly design. These tide gates will be replaced with a flexible rubber tide gate. The opening of this style of tide gate is a vertical slot in a single molded piece of rubber that is mounted at the outlet of the culvert. The vertical opening is flexible and the default position is closed. When the hydraulic head differential changes, the slot opens and water flows downstream. The hydraulic head differential needed to open this type of gate is quite small, so the water flows out slowly. This design is low maintenance and debris will not prevent the gate from closing. The flexible nature of the opening allows it to close over debris and form a seal.

All replacement gates will make use of existing headwall structures and will be installed at the same level as the existing gates. The tide gate work will generally consist of removing the existing tide gates and likely re-drilling and installing new stainless steel anchors epoxied into existing concrete. The new tide gates will generally be placed by cranes then bolted into place. There are existing access roads to each of the tide gate locations, with the exception of the 24-inch tide gate south of Jacobs Avenue adjacent to the NB Eureka Slough Bridge. Here, the replacement work will likely be accessed by foot. Tide gate replacement will coincide with low flow / low tide periods during the summer months, June through October (*see* Appendix VII of the BA for more information about the sequence and duration of construction activities) to minimize turbidity and exposure to fish. Even at low tide there may be a small amount of run-off flow, and one or two construction workers may enter the channel to position and install the new gate. Therefore, momentary minor elevated turbidity is anticipated within the immediate vicinity from construction workers disturbing the channel substrate.

Rock Weir Construction at Gannon Slough
Caltrans proposes to construct a fish weir in the channel of Gannon Slough downstream of the tide gates to facilitate passage success for all salmonid life stages by decreasing the jump height going into the tide gate and provide a staging area for adults migrating upstream during the spawning season. Approximately 100 cubic yards of 1/4-ton rock will be installed to provide backwater at the outlet of the triple tide gates (diagram in Appendix IV). The weir will be sealed with gravel and fines, creating areas where water can pool below the tide gates during ebb tide. The rock will cover an area 40 feet by 20 feet by about 3 feet deep, and extend several feet up the side banks to prevent scouring from the outpour of the tide gates. Placement of the rock will coincide with low flow / low tide periods during the summer months (*see* 3.7.1 and Appendix VII) to minimize turbidity and exposure to fish. Construction of the weir will likely be completed during a single low tide event. When the tide re-floods the area some minor turbidity could be generated.

5. Wetland Restoration

Caltrans proposes to restore wetland along the margin of Humboldt Bay as compensatory mitigation required by regulatory agencies other than NMFS for impact associated with highway construction elements of this proposed action (such as wetland loss), as well as other projects. The proposal involves establishing mitigation credits at two sites (on three parcels) referred to as the Lanphere Parcel (one parcel) and Samoa Parcels (two adjacent parcels). All three parcels consist of diked and drained former tidelands that are currently in agricultural use. Combined, the parcels comprise approximately 158 acres and offer an opportunity to create up to 15 acres of wetland, 100 acres of wetland restoration/enhancement, and 4 acres of upland buffer. They propose to rehabilitate or enhance approximately 80 acres of freshwater Palustrine Forested or Palustrine Scrub-shrub wetland at the Samoa Parcels; and reestablish 30 acres of Estuarine Intertidal Emergent and Unconsolidated Shore (mudflat) under a full or muted tidal alternative at the Lanphere Parcel. Alternatively, 40 acres of the Lanphere Parcel may be converted to Palustrine Forested or Palustrine Scrub-shrub freshwater wetland. Caltrans propose to create mitigation credit, and utilize a portion of such available credit to compensate (under regulatory schemes other than the ESA) for the loss of wetlands resulting from highway construction components of the proposed action. The Caltrans 2016 Humboldt Bay Area Mitigation Concept Design Report describes additional information, and is hereby incorporated by reference.

Caltrans anticipates that highway construction elements along Route 101 will permanently impact approximately 8.2 acres of wetland and waters subject to permit under the Clean Water Act (United States Army Corps of Engineers jurisdiction), and an additional 2 acres of less-than-three parameter coastal wetland (subject to permit under the California Coastal Act). Corridor improvements will also temporarily impact approximately 4.4 acres of federal jurisdictional wetland and approximately 0.1 acre of coastal wetland. Impacts to three-parameter wetlands will be mitigated through a 1:1 replacement of re-established wetland. Any mitigation required above and beyond the 1:1 will be mitigated through wetland restoration and enhancement actions. Caltrans will make use of the United States Army Corps of Engineers South Pacific Division standard operation procedure (SPD 12501.1, Mitigation Ratio Checklist) to propose appropriate compensatory ratios for regulatory agency approval based on a comparison analysis of wetland function between the impact site and proposed mitigation at the Lanphere Parcel and

Samoa Parcels, yet to be determined. Any remaining credit within the "mitigation bank" will be available for mitigation requirements originating from other existing or future projects (e.g., City of Arcata Humboldt Bay Trail-North Project, Humboldt Bay Bridges, future unidentified projects within the mitigation service area).

Only freshwater wetland restoration with no direct connectivity to the bay is proposed at the Samoa Parcels. The Lanphere Parcel is located behind an existing levee along Mad River Slough (i.e. north arm of Humboldt Bay) and provides opportunity for either freshwater or tidal restoration. Caltrans is currently evaluating a number of possible restoration approaches at the Lanphere Parcels, including freshwater wetland expansion, muted tidal restoration of salt marsh habitat, full tidal restoration of salt marsh habitat, or a combination of these approaches.

The freshwater wetland restoration alternative at the Lanphere Parcel includes rehabilitation of the existing outboard levee and would enhance or establish freshwater marsh and forested wetland within the existing wet meadow and pasture areas. Accumulated freshwater at the Lanphere Parcel site (from precipitation and groundwater seepage) would drain to Mad River Slough via water control structures in the Mad River Slough outboard levee.

The muted tidal restoration alternative at the Lanphere Parcel would involve rehabilitating the existing outboard levee and installing an inlet/outlet water control structure to create a muted tide range within the site. Levee rehabilitation would involve adding fill material to the land side of the existing levee, and adding rock or rubble riprap armoring to the water side. Similar to the full tidal restoration alternative, an earthen berm would be constructed along the back of the site to separate the saltwater marsh from the forested wetland and freshwater wetland. The muted tidal restoration alternative would require minimal fill because the water control structure would create a tidal regime that would be compatible with existing site elevations.

The full tidal restoration alternative would allow unrestricted tidal flow into an approximately 30-acre portion of the Lanphere Parcel. A short segment of the existing outboard levee would be breached and a channel network would be excavated within the existing pasture area to achieve a channel network and tidal regime that matches that of Mad River Slough. A new setback levee would be constructed east of the existing forested wetland to prevent saltwater impacts on the existing forested freshwater wetland habitat and prevent inundation and flooding of the adjacent private parcel to the south. The full tidal restoration alternative may require placement of fill to raise site elevations to a suitable level for vegetation colonization.

6. Project Operations and Maintenance

The new Route 101 facility—including tide gates and drainage systems, bridges and new interchange—will be subject to regular inspection, maintenance, and repair. Drainage systems are maintained to prevent flooding and allow unobstructed flow. Drainage and culvert maintenance is performed in accordance with operation procedures outlined in the 2012 Caltrans Storm Water Quality Handbook Maintenance Staff Guide, hereby incorporated by reference. Caltrans maintenance will remove litter and debris as needed from drainage grates, trash racks, and ditch lines to reduce discharge to stormwater drainage systems and watercourses. The

frequency of removal is dependent on the availability of resources, safety considerations, and rate of accumulation. Cleaning is performed during the dry or low-flow season when possible.

There is ongoing periodic maintenance associated with litter removal and vegetation management throughout the corridor. Vegetation management includes the mowing of road shoulders, tree trimming, and removal of debris caused by storm damage. These maintenance activities will not materially change in frequency, intensity, or duration and may result in either discountable or insignificant negative impacts on coho salmon, Chinook salmon, steelhead, and green sturgeon or their designated critical habitat. While vegetation removal may result in small seasonal reductions of allochthonous inputs into adjacent waterways, much of this vegetation consists of exotic and/or invasive species whose spread is best controlled to the extent possible via ongoing management. Similarly, the removal of trash debris could have a benefit to aquatic species and habitats by minimizing the input of foreign, potentially harmful materials.

7. Avoidance, minimization and conservation measures.

This section describes measures proposed to avoid or minimize potential negative effects which may arise from the proposed action.

Limited Operations Period

To protect the most vulnerable life stages of sensitive fish species that occur within the action area, in-stream work (work within a bed, bank, or channel of a watercourse) will be restricted to the period between July 1 and October 15. Construction activities restricted to this period include all tide gate replacements, rock weir construction at Gannon Slough, pile installation on the banks of Jacoby Creek for the new bridge and the detour bridge, and activities associated with workers potentially walking in Jacoby Creek to install/maintain the debris containment structure and remove the old bridge piers.

This seasonal work window correlates to the period of the year when the juveniles of the listed salmonids are least likely to occur in the action area. This work window also avoids the late fall-winter migration period for adult salmon that may pass through the action area to reach spawning areas of adjoining freshwater tributaries, and the spring-early summer smolt out-migration.

Additionally, work performed within a wetted channel that involves placement of rock and/or workers walking within the channel (i.e., construction of rock weir at Gannon Slough, possible tide gate replacement, and construction/maintenance of containment systems for bridge demolition and bridge pier removal) will coincide with low flow and low tide events (outside of significant precipitation events and between the latter two hours of outgoing tides and beginning two hours of incoming tides).

Limiting in-stream work to low flow / low tide periods will minimize potential turbidity associated with workers walking in the channel or rock placement, and minimize exposure and avoid injury to fish that might otherwise be present when water levels are higher.

Bridge Work

1. To avoid barotrauma to fish, no piles will be installed in the active, wetted channel for the new SB Jacoby Creek Bridge. Piles will be vibrated, oscillated, or rotated into place on the bank 15 to 20 feet from the wetted channel. Impact driving will not be used.
2. Piers from the old SB Jacoby Creek Bridge will be cut above the low tide water level to avoid impacts to fish and fish habitat. The bridge piers will be removed without excavation or the use of isolation casing to minimize turbidity in the creek.
3. To avoid and minimize impacts to the watercourses, all bridge debris will be contained. The demolition debris containment system may be mounted on the existing bridge piers, and/or places on the stream banks outside of the wetted channel. Containment will minimize the potential for bridge demolition debris to enter the watercourse.
4. No construction equipment will work within the active, wetted creek channel; however, workers will need to walk within the stream to install, maintain, and remove the debris containment system. The contractor will be required to submit a demolition plan (to be approved by the Caltrans resident engineer) to describe the measures to be taken to restrict or minimize construction debris from entering the creek channel and to avoid or minimize the amount and extent of workers walking in the stream channel. The demolition plan will prohibit the use of any structure placed within the wetted channel of Jacoby Creek and require that demolition activities coincide with low flow periods to minimize watercourse impacts.
5. The contractor will be required to place temporary barrier fencing (or a similar form of visual barrier) along the entire length of the north and south banks of Jacoby Creek, within the vicinity of the SB and NB Jacoby Creek bridges, to minimize visual disturbance to fish and to prevent workers from crossing the creek during routine movements within the action area. In addition, the contractor will build or install a temporary footbridge that workers may use to cross the creek without walking in the wetted channel. Both ends of the footbridge will be placed outside of the wetted channel.
6. Excavations for the temporary detour bridge abutments will be above the mean high tide line, avoiding the water of the active, wetted Jacoby Creek channel.
7. To ensure adherences to all permit conditions and that all minimization and avoidance measures are implemented, a biological monitor will be present during all in-stream activities associated with removal of the old SB Jacoby Creek Bridge and piers. The biological monitor will also ensure that the temporary footbridge and the visual barrier have been properly installed and maintained.

Installation of Fish-Friendly Tide Gates

1. Tide gates will be installed during low tide (i.e., when old tide gates are out of the water) to minimize sediment release into waterways and to avoid fish that may occur at the tide gate sites when water is present.
2. Pre-project hydrologic conditions will be assessed upstream of the existing tide gates by a qualified consultant (approved by Caltrans) prior to construction to document baseline conditions.
3. The biological consultant will make the preliminary settings to the adjustable fish-friendly tide gates. Since the gates are being replaced because they no longer close effectively, the new adjustable gates will be opened enough to mimic the current hydrology. Once the tide gates are installed, upstream water conditions will be

monitored daily and the adjustable gate will be opened or closed slightly until average weekly post-construction conditions are within 95 percent of pre-construction conditions.

4. Monitoring and adjustment will continue for two years following tide gate installation by a qualified consultant. There will be no monitoring of water conditions at new tide gates that are not adjustable (i.e., tide gates at Jacobs Avenue and California Redwood Company ditches).

Pollutant, Sediment and Erosion Control Measures

Best Management Practices (BMPs) will be used to avoid or minimize impacts to water quality, aquatic habitat, and listed fish. These measures will conform to the provisions in the Caltrans 2015 Standard Specifications and the special provisions included in the contract for the proposed action. Such provisions include the preparation of a Storm Water Pollution Prevention Plan (SWPPP) prior to construction, which describe pertinent water pollution controls to apply to construction activities and illustrate the best (applicable and appropriate) BMPs for the proposed action.

Caltrans possesses a Clean Water Act National Pollutant Discharge Elimination System (NPDES) Permit, which requires a SWPPP. In order to comply with the Construction General Permit, Caltrans must use appropriately selected, correctly installed and maintained pollution reduction BMPs. The SWPPP will identify appropriate and relevant BMPs that must be implemented at the appropriate level to protect water quality at all times throughout the life of the project.

In June 2006, Caltrans prepared a Water Quality Study addressing the proposed highway construction element of the proposed action, and supplemented it in August 2006 and again in May 2010. The Water Quality Study discusses the potential impact on water quality, and identifies appropriate design and treatment BMPs. A similar water quality report will be prepared for the wetland restoration element of the proposed action, and will identify and implement the same BMPs that are applicable for wetland restoration activities at Lanphere Parcel and Samoa Parcels.

Caltrans proposes to apply all applicable BMPs presented in Table C-1 of the Stormwater Project Planning and Design Guide (PPDG). Table C-1 is a matrix of the Construction Site BMPs that have been approved for used during construction. Detailed descriptions and guidance regarding implementation of these BMPs may be found in the 2003 CSBMP. Caltrans will implement the short-term construction site BMPs and long-term design treatment BMPs, as follows:

Short-Term Construction Site BMPs:

- SS-1 Scheduling
- SS-2 Preservation of Existing Vegetation
- SS-3 Hydraulic Mulch
- SS-5 Soil Binders
- SS-6 Straw Mulch
- SS-7 Geotextiles, Plastic Covers, Erosion Control Blankets/Mats
- SS-8 Wood Mulch

- SS-9 Earth Dikes/Drainage Swales & Lined Ditches
- SS-10 Outlet Protection/Velocity Dissipation Devises
- SS-11 Slope Drains
- SS-12 Streambank Stabilization
- SC-1 Silt Fence
- SC-2 Sediment/Desilting Basin
- SC-3 Sediment
- SC-4 Check Dam
- SC-5 Fiber Rolls
- SC-6 Gravel Bag Berm
- SC-7 Street Sweeping and Vacuuming
- SC-8 Sandbag Barrier
- SC-9 Straw Bale Barrier
- SC-10 Storm Drain Inlet Protection
- WE-1 Wind Erosion Control
- NS-1 Water Conservation Practices
- NS-2 (called NS-4 in PPDG and CSBMPM) Temporary Stream Crossing
- NS-3 Paving and Grinding Operations
- NS-11 Pile Driving Operations
- NS-12 Concrete Curing
- NS-13 Material and Equipment Use Over Water
- NS-14 Concrete Finishing
- NS-15 Structure Demolition/Removal Over or Adjacent to Water
- NS-6 Illicit Connection/Illegal Discharge Detection and Reporting
- NS-8 Vehicle and Equipment Cleaning
- NS-9 Vehicle and Equipment Fueling
- NS-10 Vehicle and Equipment Maintenance
- WM-1 Material Delivery and Storage
- WM-2 Material Usage
- WM-3 Stockpile Management
- WM-4 Spill Prevention and Control
- WM-5 Soil Waste Management
- WM-6 Hazardous Waste Management
- WM-8 Concrete Waste Management
- WM-9 Sanitary/Septic Waste Management
- WM-10 Liquid Waste Management
- TC-1 Stabilized Construction Entrance/Exit

Long-Term Design and Permanent Treatment BMPs:

- Cut and fill slopes will receive a hydroseed application formulated by a licensed Landscape Architect to provide final stabilization.
- Use of asphalt dikes and overside drains will be kept to a minimum to maintain storm water sheet flow drainage patterns.
- Drainage conveyance systems will be designed with consideration of downstream effects.
- Use of a retaining wall structure to minimize impacts to adjacent wetlands and existing drainage patterns.
- Sheet flow storm water runoff drainage patterns over vegetated fill slopes and swales will be maximized for biofiltration treatment.

BMPs are summarized as follows:

1. Scheduling: construction activities involving soil disturbance will take place during dry weather conditions, generally between June 1 and October 15, to minimize sediment discharges to receiving waters. Furthermore, the SWPPP prepared by the contractor prior to construction will include a scheduling BMP that specifies: 1) the project schedule will sequence construction activities with the installation of both soil stabilization and sediment control measures; 2) BMPs will be deployed in a sequence to follow the progress of grading and construction; 3) the construction schedule will be arranged so that grading and construction will occur during the dry summer months; and 4) proper scheduling will be done to avoid grading, landscaping application, pavement striping, concrete work, and asphalt paving from occurring immediately prior to forecast rain events.
2. Preparation of Rain Event Action Plans (REAP) 48-hours prior to any forecasted precipitation to ensure adequate stabilization of equipment, materials, and soils is completed prior to rain.
3. Any debris and sediment will be contained within the work site or diverted into a sedimentation basin before being returned to any receiving waters. Excess material excavated from the work site will be disposed off-site at an approved disposal site away from any stream course.
4. Soil stabilization measures (mulching, straw wattles) will be implemented during and after construction to reduce sediment discharge from areas of disturbed soil. After construction, areas of bare soil will be seeded or planted with a non-persistent cereal grain and California native seed mix. Straw will be certified weed free. These measures will provide for immediate soil stabilization and subsequent vegetative cover (i.e., next growing season) until natural processes resume.
5. When construction is complete, watercourse banks will be returned to natural contours. The upper six inches of excavated material will be conserved and then replaced, and if necessary, seeded and planted with native, regionally appropriate species. Re-vegetated areas will be monitored for up to four years or until 80 percent success rate is achieved.
6. Silt fences, straw bales, and/or fiber rolls will be placed to control sediment discharge; minimal sediment will be released into receiving waters. Certified weed-free mulch, silt fences, straw bales, and/or fiber rolls will be applied to exposed soil areas for over-wintering protection from erosion.

7. Measures will be taken to prevent construction equipment discharges from contaminating soil or waters in the construction site. Construction site entrances/exits will be stabilized and street sweeping performed to prevent tracking of sediment.
8. Perimeter control for the temporary stockpiling of materials, soil, and debris that may contain potential contaminants (e.g., concrete debris, treated timbers). Excavated spoils will be controlled to prevent sedimentation to the stream.
9. Use of geo-synthetic fabric (e.g., plastic, filter fabric) barriers to prevent the discharge of pollutants (e.g., sediment, oil and grease, etc.) when equipment is working adjacent to or over waterways.
10. A temporary concrete washout facility will be placed on-site for concrete clean up. No concrete washings or water from concrete will be allowed to flow into waterways. No concrete will be poured within the waterways. Water that has come into contact with setting concrete will be pumped into a tank and disposed of at an approved disposal site.
11. To control fugitive dust during construction, loose debris will be cleaned up using a vacuum truck (as opposed to a kick broom machine). Also, pavement will be removed by cold planing, using a machine that deposits grindings directly into a truck. The cutting teeth of the grinder are lubricated with water, which is enough to minimize dust production, but not enough to create runoff.
12. Preparation and implementation of a sampling and analysis plan for discharges during construction.
13. Instead of conventional hydraulic fluids, non-toxic, bio-degradable vegetable oil will be used for operating the hydraulic equipment (i.e., vibratory hammer) needed to install the bridge piles at Jacoby Creek. Vegetable oil will also be used in other hydraulic equipment working over or adjacent (within 50 feet) to project watercourses as feasible.
14. Only untreated wood timbers will be used for construction within 50 feet of OHWL.

Staging Areas:

1. Primary staging areas will be on Route 101 shoulders with possible additional staging areas on nearby private property. No staging area will occur within environmentally sensitive areas.
2. Any vehicles stored within 150 feet of OHWL of drainage facilities, watercourses, sloughs, or Humboldt Bay will have spill prevention measures in place for refueling. This includes placement of an absorbent boom around the fuel port (on machine being fueled), as well as a thick absorbent mat that is rolled out on the ground under the equipment to catch a larger spill. When fueling vehicles and other equipment, there will be a person located at both the fuel nozzle and the truck valve so that emergency shut-off could be made if there was a nozzle or hose failure.
3. Proper and timely maintenance of vehicles and equipment used during construction to reduce the potential for mechanical breakdowns leading to a spill of materials.
4. All equipment remaining on the job site will have secondary containment placed beneath the drip zone when left overnight. Leaks will be immediately controlled with absorbent mats and repaired before equipment operates again. Clean up of petro-chemical drips will occur as soon as they are observed. All equipment will be monitored by the contractor daily for chemical leakage. To offer protection from storm events, Caltrans will require monitoring for storm events and the movement of equipment accordingly.

5. For all night road work and paving operations that require the use of artificial light, light shields will be used to direct lighting toward the roadway and away from adjacent water bodies to avoid impacting the aquatic environment.

Conservation of Riparian Habitat:

1. The width of the construction disturbance zone within riparian areas will be minimized through careful pre-construction planning.
2. Exclusionary fencing will be installed along the boundaries of all riparian areas and other environmentally sensitive areas (i.e., wetlands) to avoid impacts to these habitats outside of the project footprint.
3. Riparian vegetation removal (e.g., tree trimming) will be restricted to the minimum needed for construction access.
4. Once the bridge detour is removed, the median at Jacoby Creek will be re-planted with native trees and shrubs and seeded with native herbaceous vegetation that are aptly suited to the project region.

Prevention of Spread of Invasive Species:

1. All equipment used for off-road construction activities will be weed-free prior to entering the action area.
2. If the proposed action implementation calls for mulches or fill, they will be weed free.
3. Any seed mixes or other vegetative material used for re-vegetation of disturbed sites will consist of non-persistent cereal grain, California native seed mix and/or locally adapted native plant materials to the extent practicable.
4. Any equipment (including boots/waders) and construction equipment shall be properly disinfected or cleaned according to guidance provided by the 2008 State of California Aquatic Invasive Species Management Plan and 2012 Edition of the U.S. Bureau of Reclamation Inspection and Cleaning Manual for Equipment and Vehicles to Present the Spread of Invasive Species prior to in-water work to help prevent the spread of aquatic invasive species.

Interrelated or Interdependent Actions

Interrelated and interdependent actions are those that have no significant independent utility apart from the action under consideration or are part of a larger action and depend on the larger action for their justification (i.e., this action or other actions will not occur “but for” this action). No interrelated or interdependent actions have been identified that are associated with the proposed activities that are not already described as part of the proposed action itself.

Action Area

The action area encompasses the footprint of proposed construction areas and affected areas as shown in Appendix I and Appendix II of the BA and attached to this letter), and portions of 101 Slough/Eureka Slough, Gannon Slough, Jacoby Creek, Old Jacoby Creek, and Brainard Slough large enough to encompass direct and indirect impacts to these waterways associated with construction activities that may extend beyond the construction site itself. The action area extends 100 feet downstream and upstream along each of these waterways to include aquatic habitat where listed species could be affected by potential transient turbidity and sediment discharges produced during (or after) construction. In the 101 Slough, the action area extends

north to the CDFW crossing at Fay Slough where anticipated management of the new fish-friendly tide gate would allow for greater tidal circulation within the channel. The action area also includes the entire Mad River Slough where potential tidal restoration through partial or complete removal of the levee at the Lanphere parcel could result in hydromodification and temporary increases of turbidity within the slough.

Action Agency's Effects Determination

Endangered Species Act

Caltrans determined that the proposed Project, "may affect, is not likely to adversely affect" the following threatened species or critical habitats designated by the proposed action under section 7(a)(2) of the ESA and its implementing regulations (50 CFR Part 402):

Southern Oregon/Northern California Coast (SONCC) evolutionarily significant unit (ESU) of coho salmon (*Oncorhynchus kisutch*)
Threatened (70 FR 37160, June 28, 2005)
Designated Critical Habitat (64 FR 24049, May 5, 1999);

California Coastal (CC) Chinook salmon ESU (*O. tshawytscha*)
Threatened (70 FR 37160, June 28, 2005)
Designated Critical Habitat (70 FR 52488, September 2, 2005);

Northern California (NC) Distinct Population Segment (DPS) steelhead (*O. mykiss*)
Threatened (71 FR 834, January 5, 2006)
Designated Critical Habitat (70 FR 52488, September 2, 2005);

Southern DPS of the North American green sturgeon (*Acipenser medirostris*)
Threatened (71 FR 17757, April 7, 2006) (*correction* 71 FR 19241 April 13, 2006).
Designated Critical Habitat (74 FR 52300, October 9, 2009)

Magnuson-Stevens Fishery Conservation and Management Act

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Caltrans determined that the proposed action "may adversely affect" EFH for Pacific Salmon (SONCC coho salmon and CC Chinook salmon), groundfish, and coastal pelagic species within the action area waterways.

Action Agency's Effects Analysis
In their BA, Caltrans identified several possible ways the proposed action may affect coho salmon, Chinook salmon, steelhead, or green sturgeon, or related critical habitat. Caltrans approached their assessment, first, by analyzing elements of the action across time and space, then collectively as a whole across time and space. Caltrans examined the risk of exposure by identifying the period when pertinent juvenile and adult life stages of the species addressed may be directly exposed to proposed activities or indirectly exposed later from changes to the physical environment (habitat) likely to result from proposed activities. In all aspects of their analysis, Caltrans considered the relevant behavior and biological needs of the members of the species addressed; and considered the existing status of the species and existing environmental conditions that form their habitat.

Caltrans assessed the risk of exposure from proposed in-stream activity that is limited to brief foot traffic within stream segments at a time and place where listed species are extremely unlikely to be encountered. They also assessed the impact of highway construction noise and motion near or within streams. Caltrans assessed the risk of exposure from extremely brief and small perturbations in water turbidity, chemical pollution, light, and hydrology.

More specifically, Caltrans described how their proposed activities may affect coho salmon, Chinook salmon, steelhead, green sturgeon or their habitat by affecting water quality, water quantity (flow), sound, migration, vegetation, and feeding. Water quality may be affected by elevated turbidity stemming from ground disturbing activities within and outside of stream channels; or elevated chemical or nutrient pollution originating from an increase in impervious surface and fresh asphalt; or changes in salinity when levees are breached or fish-friendly tide gates are installed. Changes in water quantity could occur from an increase in impervious surfaces and wetland fill, thereby increasing the timing of runoff. Sound may be affected by noise generated by vibratory pile driving and other construction activities near waterways. Vegetation could be affected by the removal of riparian vegetation to accommodate transportation facilities or the expansion/reduction of emergent and aquatic vegetation due to changes in salinity levels and tidal circulation with installation of fish-friendly tide gates. Fish migration may be affected by changes in tide gate design type and aperture. Feeding could potentially be affected by noise and visual disturbances or turbidity during construction that could flush fish from foraging areas and/or the loss of vegetation that provides allochthonous inputs which support forage species.

The following subsections summarize Caltrans's analysis presented in their BA and subsequent written clarification made to NMFS.

Potential Effect Pathways
Potential effects of the proposed action to the federally listed fish species and the PBFs of designated critical habitat:

- Habitat Changes
    - Wetland Fill
    - Wetland Restoration
    - Tide Gate Replacement and Weir Construction
    - Vegetation Disturbance

    - Use of Artificial Lighting
    - Increased Shading
- Noise and Visual Disturbance
    - Exposure to Pile Installation Noise and Vibration
    - General Construction Noise and Visual Disturbance
- Water Quality Effects
    - Turbidity and Sedimentation
    - Pollutants Associated with Stormwater Runoff and Accidental Spills

Wetland Fill

Proposed corridor improvements will fill or cover approximately 12.6 acres of wetland. Approximately 4.4 acres of which will be from short term by staging activities and will be restored once construction is complete. Approximately 7.55 acres will be permanently affected by the placement of additional impervious surface (i.e., new pavement and concrete pad for cable rail) and approximately 0.65 acres will be permanently affected by the placement of pervious surface (i.e., clean fill for embankment).

Of the approximate 8.2 acres of permanent wetland fill, about 8.1 acres consist of sliver fills of Palustrine (freshwater) emergent wetland along the edges of the roadway shoulders and median for the lengthening of acceleration/deceleration lanes, placement of shoulder backing, cable railing, and construction of the interchange.

In addition to freshwater wetland impacts, approximately 0.07 acre of estuarine intertidal wetland and estuarine subtidal waters would be permanently affected by construction of the rock weir and bank armoring at Gannon Slough. Less than 0.10 acre of intertidal wetlands along the banks of Jacoby Creek would be temporarily shaded or covered by placement of the detour bridge and debris containment systems. Rock weir, bank armoring, and shading may reduce water quality (i.e., temporarily increased turbidity, and decreased bio-filtration capacity) or food subsidies (i.e., allochthonous material). The channels associated with these wetlands provide juvenile rearing habitat for the listed salmonids and contribute water quality and food subsidies for salmonids and green sturgeon that may feed downstream within the bay. They also serve as migration corridors between the ocean and freshwater spawning habitats for coho, Chinook and steelhead.

Fill Encroachment in Freshwater Wetlands

Wetland fill encroachment and new impervious surfaces have the potential to cause an increase in peak flow and higher runoff volumes that can lead to channel scouring and bank erosion, which in turn, can increase sediment and turbidity in receiving waters. It can also lead to decreased storage capacity and outflow efficiency, thereby negatively affecting tidal floodplain processes that are important for salmonid critical habitat (i.e., access to and quality of floodplain habitat). Changes in tidal floodplain processes can affect water quality and food subsidies for salmonids.

Stormwater runoff will discharge to the same drainages as pre-project conditions. Due to the area's flat terrain and predominate sheet flow drainage patterns onto vegetated slopes, the small increase in impervious surface created by the project is not expected to create channel scouring

or bank failures. The minimal loss of permeable surfaces is insignificant and will be mitigated (i.e., effects rendered insignificant to species and critical habitat addressed) by proper drainage facility design. Drainage facilities will be created during the same summer season which the small loss of permeable surface occurs, essentially contemporaneously with the impact. The loss of permeable surface is insignificant because it would not cause a measurable or detectable impact to water quality. Also see discussion of water quality impacts (page 38).

In addition, the fill encroachment footprint will not decrease storage capacity or outflow efficiency because it is not located below stream channels or below ordinary high water. When compared to the total area available for inundation of floodwaters as defined by the Zone A floodplain (Federal Emergency Management Agency designation), the fill encroachment footprint is negligible (an infinitesimal fraction of the total floodplain). The floodplain has adequate carrying capacity remaining for the volume of fill encroachment on wetlands from the proposed action without significantly diminishing the processes conveying freshwater drainage to tributaries and sloughs.

Although Caltrans may not have addressed all of the possible functions of the grass-vegetated area along the highway, NMFS understands the functions of the grass-vegetated areas along the highway is to filter or arrest pollutants such that wash off the paved highway surface; and periodically during flooding events serve the substrate (bottom) of the flooded bay or estuary. There are many possible pollutants, including but not limited to sediment, zinc, copper, and other chemicals derived from petroleum-based materials. After the highway is widened by paving over wetland area, the remaining grass-vegetation area would be of sufficient size and capability to function as a filter that would arrest pollutants. During periodic flooding of the grass-vegetated area, the grass-vegetated area and any paved surface would serve as the substrate, not obstructing migration or passage.

Estuarine intertidal wetland and estuarine subtidal waters
The temporary detour bridge at Jacoby Creek will be constructed outside the channel and will not alter channel flow or decrease storage capacity because it is located outside of the Jacoby Creek channel, and rain water interception from the new bridge would be essentially the exact same as the current old bridge. Placement of rock within Gannon Slough to construct the rock weir and stabilize the channel bank will not significantly decrease storage capacity or alter flow characteristics because the volume of rock is infinitesimally small compared to the total remaining floodplain volume capacity. The rock will reduce bank erosion and ultimately enhance fish habitat by facilitating fish passage and providing a staging area for adult migration.

As there would be, essentially, no decrease in capacity of existing drainage systems, no substantive change in existing drainage patterns or encroachment of channel flow, the effect of wetland fill encroachment on the PBFs of salmonid and green sturgeon critical habitat would be insignificant.

Direct impacts such as crushing to individual coho, Chinook, and steelhead from wetland encroachment would be avoided by restricting the placement of rock within Gannon Slough to the time of year and day (i.e., summer low flow/low tide periods) when salmonids are extremely unlikely to be present.

Wetland Restoration
Restoring hydrologic connectivity through partial or full removal of the levee that currently separates the Lanphere parcel from the Mad River Slough could potentially influence nutrient cycling and provide additional food resources for salmonids, green sturgeon, and other aquatic organisms.

Since the levee was constructed, the parcel has subsided by as much as three feet. Fill material would be imported to restore the parcel to an elevation that could support salt marsh vegetation and mimic (to some degree) historic tidal processes. The creation of salt marsh would enhance topographic complexity and potentially provide structural patch richness of the marsh plain, which could further benefit salmonids and green sturgeon by providing additional habitat for prey species.

Potential negative effects of tidal restoration include temporary increases in turbidity during levee removal and placement of fill for construction of salt marsh. Although groundwork would be completed during low tide, turbidity is likely to be produced when tides re-flood disturbed work areas. Excessive turbidly can be harmful to fish and other aquatic organisms. Juvenile and adult fish need clear water to see their prey, which consists primarily of aquatic insects and other macro-invertebrates. Excessive turbidity can also inhibit growth of eelgrass, a component of essential fish habitat that contributes to water quality and provides food subsidies for the listed species.

Little is known about salmonid and green sturgeon use of the Mad River Slough. The slough does not offer estuarine rearing habitat, but could potentially provide rearing habitat for salmonid smolts that delay migration to the open ocean and foraging areas for sub-adult and adult green sturgeon that over-summer in Humboldt Bay. Utilization is probably low given its shallow water depth (for green sturgeon), and distant proximity from natal tributaries and estuarine rearing habitats for salmonids. The risk of exposure of listed salmonids to project impacts is extremely unlikely within the Mad River Slough.

PBFs of critical habitat for the listed salmonids and green sturgeon that could be affected by proposed restoration include food resources and water quality (due to construction-related turbidity). Given the existing background levels of turbidity in shallow areas of the bay created during wind events, project-related turbidity is not expected to reduce the availability of food resources or significantly compromise water quality (they are only insignificantly damaging water quality), and any change in water quality would be highly unperceivable by any salmonids that may frequent Mad River Slough. Besides, salmonids are adapted to periodic increase in water turbidity, and changes in water quality within near shore environments such as Mad River Slough, Humboldt Bay. Impacts to individual salmonids would further be minimized by restricting in-stream work to the period between July 1 and October 15 to avoid the period of smolt ocean migration.

If tidal restoration is pursued, the areas of restored salt marsh have the potential to provide habitat for salmonids. The proposed wetland restoration is expected to benefit listed species and designated critical habitat, but the level of benefit is unknown (but likely inconsequential due to

the small area of improvement and listed salmonid species infrequent the Mad River Slough area of Humboldt Bay.

Tide gate Replacement and Weir Construction

Where fish habitat is present (101 Slough, Brainard Slough, Old Jacoby Creek, Gannon Slough) the existing tide gates will be replaced with fish-friendly tide gates with an auxiliary door. The fish-friendly design will allow essentially the same opportunities for fish to move downstream but will improve upstream movement. They will also allow current suitable hydrologic conditions to be maintained (due to existing leakage) while providing safe passage for fish.

All of the fish-friendly tide gates installed would be adjusted to mimic existing hydrological conditions, with the possible exception of 101 Slough. Through coordination with the USFWS, NMFS, and CDFW, the fish-friendly tide gate at this location may be adjusted to allow for greater tidal circulation to improve upon habitat within the channel. The USFWS prepared a hydraulic analysis of the 101 Slough in 2008, concluding it is feasible to improve water quality upstream of the tide gate by increasing the daily ebbing, mixing, and flooding from the bay while maintaining drainage capacity for storm flow and the existing fresh water regime on adjacent lands (i.e., Fay Slough Wildlife Area). The current limit of tidal influence is near the CDFW crossing at Fay Slough where cattails fill the channel. Increasing tidal circulation in the 101 Slough may, over time, reduce the extent and density of cattails that currently limit available rearing habitat and cause flooding on adjacent lands. It could also favor the expansion of eelgrass, a component of essential fish habitat, contributing to water quality and providing food subsidies and velocity refuge for salmonids. Although the 101 Slough is not designated critical habitat for listed salmonids or green sturgeon, improving tidal circulation and habitat conditions through proper tide gate adjustment would benefit adjoining designated critical habitat of Eureka Slough by improving the quality of water entering the slough from the 101 Slough and promoting eelgrass habitat.

Elsewhere, the PBFs (physical and biological features) of salmonid critical habitat that could be affected by tide gate replacement pertain to estuarine rearing habitat and migration corridors that provide for safe passage. Currently, the culverts under the railroad grade that connect Old Jacoby Creek and Brainard Slough to the bay are crushed, limiting, if not barring, fish access. The addition of fish-friendly tide gates at these locations would allow passage should fish access this location.

At Old Jacoby Creek, the goal for restoration includes establishing a better connection between the tide gate and the Jacoby Creek floodplain to improve fish passage and reduce the risk of flooding during major winter storms. Replacement of the tide gate at Brainard Slough with a fish friendly design would provide additional off-channel rearing habitat for juvenile salmonids emigrating from adjacent spawning areas of Rocky Gulch and Washington Gulch. Similarly, installation of a fish-friendly tide gate at Gannon Slough will facilitate fish passage to suitable spawning habitats further up in the watershed (i.e., Beith, Campbell, and Grotzman Creeks). The construction of a rock weir at Gannon Slough is intended to, and will likely facilitate passage success for all life stages by decreasing the jump height that is necessary for fish to pass through the tide gate and provide a staging area for adult migration.

General construction noise, visual disturbances and minor turbidity may be generated should workers need to walk in or near the channels to position the tide gates (*see* pages 34 on noise for an explanation of possible impacts from noise). Potential impacts to critical habitat and individual fish will be minimized with implementation of the avoidance and minimization measures. These measures include scheduling BMPs that restrict in-stream work to the period between July 1 and October 15 and during low tide to minimize sediment transport and avoid the most vulnerable life stages of salmon smolt and adult migration and the winter juvenile rearing period. Given the poor quality of available estuarine rearing habitat within the action area during the summer months, it is anticipated that few, if any, coho, Chinook or steelhead would be exposed to construction related noise, visual disturbance or turbidity associated with tide gate replacement. Given the existing background levels of turbidity in shallow areas of the bay, minor, localized, and short term increases in turbidity resulting from tide gate installation is not expected to reduce the availability of food resources or significantly compromise water quality.

While the benefits to critical habitat and individual fish from the installation of fish-friendly tide gates at Old Jacoby Creek and Brainard Slough may not be immediately realized, they will maintain existing hydrological conditions important for estuarine rearing and present opportunity for fish passage to rearing and/or spawning areas once other barriers are removed. The fish friendly tide gate and rock weir at Gannon Slough would benefit coho, Chinook and steelhead critical habitat by facilitating safe passage for adult and juvenile salmonids and providing a staging area for adult migration. These features may also improve water quality and foraging opportunities for green sturgeon that feed in the bay by: 1) reducing erosion and turbidity within the channel through stabilization of the substrate, and 2) maintaining the existing muted tidal regime and improving benthic habitat (through greater complexity) for prey species.

Potential negative effects to individual fish (coho, Chinook, steelhead and green sturgeon) associated with increased levels of turbidity during, or following construction are insignificant considering the timing of the work (summer/low tide when few fish would be expected within the action area) and short duration (2 to 4 hours per gate) of potential exposure.

Riparian Vegetation Disturbance

There will be a temporal loss (i.e., two to three years) of approximately 0.05 acre (~2,000 square feet) of riparian vegetation along Jacoby Creek to accommodate the abutments for the SB bridge detour. This includes the removal of four large (dbh 30–61 inches) Monterey pines and a mix of native and non-native herbaceous vegetation from within a portion of the highway median both north and south of the creek. There will also be temporary disturbance to approximately 200 square feet of ruderal, herbaceous vegetation on the upper bank of Gannon Slough to gain access for widening of the SB Gannon Slough Bridge, and potentially minor trimming of willow limbs for access to construct the NB Jacoby Creek Bridge rails.

The bridge work is not expected to diminish the functional values of the action area's riparian vegetation. The removal of vegetation from the median at Jacoby Creek will result in a minor, temporal loss of cover, shade, and allochthonous inputs until native vegetation (trees and shrubs) are planted and matured. However, given the scale of the impact, no measurable increase in water temperature or reduction in the amount of terrestrial food input into Jacoby Creek is anticipated and there remains ample vegetative cover of higher quality habitat immediately

upstream of the project site for fish to take refuge. In addition, existing non-native trees will be replaced with native trees and shrubs that are more aptly suited to the region once construction is complete.

With incorporation of the conservation, avoidance and minimization measures, potential negative effects to listed salmonids and green sturgeon from the temporal loss of riparian vegetation and associated functions are discountable given they are extremely unlikely to occur, and would be insignificant if they were to occur. Negative effects to critical habitat are considered insignificant given the scale of the impact and the measures in place to restore the habitat once construction is complete.

Aquatic and Emergent Wetland Vegetation Disturbance

Replacement of the SB Jacoby Creek Bridge could affect approximately 2,400 square feet of Lyngbye's sedge that grows within the channel and on the lower banks below OHWL in the vicinity of the bridge (*see* photos, Appendix VI). The sedge provides channel and bank stabilization, water quality functions, cover, velocity refuge, and is a source of allochthonous material to the creek, contributing nutrients and food resources that can benefit fish.

The detour bridge will temporarily shade a portion of this Lyngbye's sedge population. Workers walking in or on the banks of the creek to install or maintain the containment system for demolition of the existing bridge could potentially trample plants or tear underground rhizomes. Measures will be employed to avoid or minimize damage to this vegetation to the extent possible during construction, which includes the placement of protective metal, wood, or rubber sheets over the substrate where needed to provide a physical barrier and distribute weight loads to prevent soil compaction and damage to culms and rhizomes. Impacts to the population will also be minimized by using fencing to restrict access to the creek to minimal need and the smallest feasible project footprint.

Lyngbye's sedge is somewhat resilient to disturbance given its rhizomatous growth habit and ecological plasticity. Potential impacts associated with shading from the bridge detour or ground disturbance from foot traffic are considered minor because remaining vegetation offer plenty of habitat function to support salmonid specie. And, since disturbed vegetation is expected to fully recover within a few seasons after construction, vegetation density will return to pre-project condition.

In addition to the temporal impacts, the wider bridge configuration could potentially inhibit growth or decrease density of approximately 40 square feet of Lyngbye's sedge currently growing in an area that would be shaded by the new bridge, resulting in permanent loss. Permanent loss of this vegetation due to increased shading is insignificant given the small scale of vegetation potentially affected compared to the amount of like vegetation within the channel that will continue to provide channel stability, cover, water quality functions, velocity refuge, and food resources for the listed salmonids, as well as food resources for salmonids and green sturgeon that may feed further downstream within the bay.

Eelgrass is present in the 101 Slough (near the tide gate at Eureka Slough), and in the Mad River Slough fringing island and channel banks. Eelgrass is a component of EFH. In the Mad River

Slough, eelgrass, as a type of aquatic vegetation, supports the physical and biological feature associated with critical habitat for the listed salmonids and green sturgeon. Eelgrass beds provide a number of important ecological functions that benefit fish and other aquatic organisms upon which they depend. Primary factors that influence eelgrass growth are suitable substrate, acceptable current velocity, and light penetration.

Installation of a fish-friendly tide gate on the 101 Slough will not change the substrate or substantially alter water depth, temperature, or velocity, and is therefore not expected to reduce the amount of eelgrass within the channel. The tide gate may be adjusted to sufficiently increase salinity levels within the channel to facilitate the expansion of eelgrass. This could improve the rearing habitat available for juvenile salmonids within the channel and contribute food subsidies and water quality benefits for salmonids and green sturgeon that may feed further downstream within the bay. Over time, increasing salinity levels may also reduce the density and extent of cattails within the channel, which could increase flood storage capacity, and open up additional rearing habitat for salmonids.

Eelgrass is sensitive to turbidity. Turbidity in the water column and sediment that binds to leaf blades can limit light penetration and reduce growth. Tide gate replacement on the 101 Slough and wetland restoration adjacent to the Mad River Slough has the potential to generate and transport sediment that, if not managed, could negatively affect eelgrass growth. The amount of turbidity generated will be minimized by, among other things, restricting in-stream work to low flow/low tide periods and soil stabilization and erosion control. With implementation of measures that minimize turbidity, potential impacts to eelgrass from construction-related turbidity are discountable given they are extremely unlikely to occur, and would be insignificant if they were to occur because they would be short term (on the order of hours) and likely rinse clean off the leaves within a day or so whereby resulting in inconsequential disturbance to photosynthesis and plan growth. These measures include a number of best management practices to avoid/minimize sediment delivery to receiving waters including, but not limited to, restricting in-stream work to low flow/low tide periods, preparation of a Storm Water Pollution Prevention Plan and a Rain Event Action Plan, and soil stabilization and erosion control. Project-related turbidity would be localized, short term, and not expected to significantly exceed existing background turbidity levels inherent in Humboldt Bay.

In summary, potential negative effects to listed salmonids, green sturgeon and their designated critical habitat from impacts to riparian, aquatic and emergent wetland vegetation and associated functions is insignificant and/or discountable given the scale and likelihood of potential impacts. The potential expansion of eelgrass and reduction of cattails within the 101 Slough would be completely beneficial to fish. If pursued, tidal restoration on the Lanphere parcel could provide estuarine channel structure capable of supporting aquatic and emergent wetland vegetation that may benefit the listed fish and expand designated critical habitat. Potential negative effects associated with minor, localized, and short term increases in turbidity during construction will be minimized to a less than significant level with incorporation of the avoidance and minimization measures. Given that no significant degradation of critical habitat would result from vegetation disturbance, there would be no detectible loss of water quality or food subsidies for individual coho salmon, Chinook salmon, steelhead or green sturgeon.

Artificial Lighting
Changes to ambient lighting patterns from the use of artificial light at night can interfere with physiological processes in fish, including the secretion of hormones that effect growth and maturation, which can disrupt juvenile migration and adult reproduction. It can also cause fish to relocate from suitable habitat, potentially making them more vulnerable to predation.

Due to high daytime traffic volumes within the corridor, grading and paving operations that encroach on existing roadway shoulders and lanes and the paving of new acceleration, deceleration and auxiliary lanes would need to be performed during off-peak hours, including evening hours past sunset. For all night time road work and paving operations that require the use of artificial light, light shields would be used to direct lighting toward the roadway and away from adjacent water bodies to avoid impacting the aquatic environment. Caltrans expects that light intensity from these operations would not be appreciably greater than typical nighttime headlight and bright full moon illumination.

The majority of road work will occur during the dry summer months when salmonids are least likely to occur within the action area, but may continue past October 15 as weather permits. Considering that preferential use of the action area by the listed salmonids is largely tied to the onset of the rainy season and that roadway work is limited by wet weather conditions, the potential for artificial light exposure on coho salmon, Chinook salmon, and steelhead is extremely unlikely to occur, resulting in discountable effects. If exposed, avoidance behavior by individuals would be insignificant considering the low intensity and frequency of use of that light.

The jack-and-slide operation to move the new SB Jacoby Creek Bridge into its final alignment will require the use of artificial light at night to ensure worker safety. Light needed for the operation will illuminate much of the creek channel within the vicinity of the bridges for the duration of one night between the period of July 1 and October 15. This work window avoids the most vulnerable life stages of coho, Chinook, and steelhead smolt and adult migration and the winter estuarine rearing period for juvenile coho and steelhead. Juvenile salmonids that may be present in the channel during the operation are likely to flush from the project site due to overhead noise and visual disturbances associated with construction. Given the limited suitability of the action area at this location for summer rearing, the availability of higher quality rearing habitat immediately upstream of the action area where fish would relocate, and the short duration of exposure, the use of artificial light is not likely to have a significant effect on individual coho salmon, Chinook salmon or steelhead, or any PBFs of designated critical habitat.

The use of artificial light would not affect green sturgeon given they are unlikely to venture into the shallow waters of Jacoby Creek, nor is temporary, short term use of artificial light likely to negatively affect water quality or food resources of green sturgeon critical habitat.

Shading
The new SB Jacoby Creek Bridge will shade approximately 100 square feet more of the creek than the existing bridge. In addition, bridge rail upgrades on the NB Jacoby Creek and NB Gannon Slough bridges will shade approximately 50 and 75 additional square feet, respectively.

Potential effects on fish associated with decreased light penetration and aquatic vegetation include reduced foraging success and altered migration timing due to a reduction in primary productivity and associated reductions in prey species. Decreased light penetration and shading impacts on vegetation could also result in fish expending increased energy or being increasingly exposed to predation because of loss of suitable habitat and cover.

It is unlikely there would be any measurable difference in primary production or invertebrate composition and abundance from the small increase in shading from bridge improvements. While the wider bridges may further limit, to some immeasurable degree, primary productivity (e.g., benthic algae, phytoplankton), insolated reaches of these systems both upstream and downstream of the bridges will continue to provide adequate nutrients and food subsidies that support prey species, which are circulated throughout the system through tidal action.

The area of Gannon Slough within the action area currently lacks aquatic vegetation, largely due to channel morphology and the dynamic nature of existing tidal processes rather than shading from the bridges. Aquatic vegetation remains absent both upstream and downstream from the bridges, despite greater insolation. Consequently, there is little in-stream structure to support aquatic invertebrates aside from benthic organisms that burrow into the substrate for cover. These organisms would not be negatively affected by any minor increase in shading, and could potentially receive some minor benefit by gaining thermal protection during warmer months or low flows.

Within Jacoby Creek, the increased shading could affect approximately 40 square feet of in-stream vegetation by limiting the amount of light to the channel, potentially below compensation thresholds needed to support growth. Permanent loss of this vegetation due to increased shading is insignificant given the small scale of vegetation potentially affected compared to the amount of like vegetation within the channel that will continue to provide adequate channel stability, cover, water quality functions, velocity refuge, and food resources for the listed salmonids, as well as adequate food resources and water quality functions for salmonids and green sturgeon that may feed further downstream within the bay.

Juvenile salmonids migrating downstream may hesitate to pass overwater structures, which could potentially delay their migration. Researchers found that Chinook salmon smolts avoid overhead cover as they migrate downstream in lighted flume experiments. Juvenile coho and steelhead have been observed balking before encountering shadows cast by bridges. Smolts of all species generally migrate at night. However, researchers found that the pattern for Chinook salmon and steelhead in the Sacramento and San Joaquin River watersheds were shown to be less significant as they enter the estuary. Coho salmon smolts and fry typically migrate at night. For the majority of individuals (i.e., those which would migrate at night), the shadow cast by the bridges would not be expected to appreciably delay their migration. Therefore, no significant negative effect to salmonid migration due to increased shading is expected.

In summary, while increased shading may result in small, localized reductions of primary production, the scale of the impact is insignificant, and accordingly is not likely to decrease the quality of the estuarine rearing habitat or migration corridor function for the listed salmonids, or water quality and food resources for green sturgeon. Increased shading could have a minor

benefit for water quality during the summer months by maintaining water temperatures important for rearing, although this affect would also likely be insignificant.

Given that potential effects to the PBFs of designated critical habitat for the listed species are insignificant, Caltrans anticipates no likely adverse effect to individual coho salmon, Chinook salmon, steelhead or green sturgeon resulting from a minor increase in shading.

Noise and Visual Disturbance

Construction activities performed in or near the project watercourses may result in behavioral responses to stress associated with noise and visual disturbance of juvenile coho salmon, Chinook salmon, and steelhead that could be present during the in-stream work period of July 1 through October 15. Physical changes to the water column caused by variable shading, vibration from construction equipment and pile installation, and/or workers periodically walking in or near the channel could disrupt feeding, delay migration, or flush fish from suitable habitat, potentially making them more vulnerable to predation.

Exposure of individual fish is expected to be low given the poor quality of the rearing habitat within the action area during the summer months (resulting in a low likelihood of fish presence). The work window also avoids the critical period (time of most activity) of adult and smolt migration. Furthermore, adverse effects to listed species will be avoided with implementation of avoidance and minimization measures which restrict noise below levels that would hurt fish. Piles will be driven by vibrating them into the earth (not driving them in by impact hammer).

Exposure to Pile Installation Noise and Vibration

Exposure to abrupt, extreme changes in water pressure can be harmful or fatal to fish. Injury sustained from these pressure changes is termed barotrauma. In 2008, the Fisheries Hydroacoustic Working Group (FHWG) identified the conditions when underwater sound would likely cause injury to fish due to extreme changes in water pressure from impulsive noise impacts. Injury to fish from impulsive sound waves, such as that caused by impact pile driving and blasting, occurs at sound pressure levels of 206 dB (decibels) peak and 187 dB accumulated sound exposure level (SEL) for salmonids, except those that are less than two grams. For juvenile fish weighing less than two grams, the criterion for the accumulated SEL is 183 dB. The threshold for behavioral effects on fish was established at 150 dB.

The environmental conditions found in the project area, such as soft bay muds and shallow water, make the use of a vibratory driver feasible, which will minimize hydroacoustic effects on aquatic organisms (opposed to impact driving). Sound levels emitted by vibratory drivers can be between 10–20 dB lower than impact hammers. Additionally, the effects of continuous sound of vibratory pile driving are thought to affect fish differently than impact hammers with less potential for acute injury.

The criteria for injury to fish from vibratory driving are estimated differently from impact driving noise. Experts deduct that the type of sound produced by an impact hammer (impulse) is more injurious to fish than that produced by a vibratory hammer (continuous); and reason that only peak sound pressure level can be used to assess physical injury to fish when a vibratory hammer is used.

Sound pressure levels collected for a variety of pile types installed using a vibratory driver, without attenuation, are shown below in Table 5.1. The peak SPL of all these were below the 206 dB threshold of injury to fish. The steel piles used for the abutments of new SB Jacoby Creek Bridge will be 36 inches in diameter and placed 15 to 20 feet from the wetted channel. For comparison, the average peak sound pressure level produced during in-water vibratory driving of a 36-inch steel pipe at a depth of approximately 16 feet is 185 dB (Table 5.1). Peak sound pressure levels produced during pile installation at Jacoby Creek are likely to be less than this considering that pile installation will be performed out of water and the sound will attenuate to some degree through the substrate before reaching the channel. Weak or soft soils, such as those present within or near Jacoby Creek, have been shown to have relatively high attenuation rates compared to more competent soils, attenuating as much as 8.4 dB per doubling of distance. Sound pressure thresholds for pile installation are therefore expected to be well below the 206 dB threshold of injury to fish.

Table 5.1. Summary of Near-Source (10-Meter) Un-attenuated Sound Pressure Levels for In-Water Pile Installation Using a Vibratory Driver/Extractor.

Pile Type and Approximate Size	**Relative Water Depth**	**Average Sound Pressure Measured in dB**		
		Peak	RMS*	SEL**
12-inch steel H-type	<5 meters (16 feet)	165	150	150
12-inch steel pipe pile	<5 meters (16 feet)	171	155	155
36-inch steel pipe pile – typical	<5 meters (16 feet)	180	170	170
24-inch AZ steel sheet – typical	~15 meters (49 feet)	175	160	160
24-inch AZ steel sheet – loudest	~15 meters (49 feet)	182	165	165
36-inch steel pipe pile – loudest	<5 meters (16 feet)	185	175	175
72-inch steel pipe pile – typical	<5 meters (16 feet)	183	170	170
72-inch steel pipe pile – loudest	<5 meters (16 feet)	195	180	180
Source: Caltrans 2015d. Table I.2-2 of Appendix I Compendium of Pile Driving Sound Data				
* Impulse level (35 millisecond average) ** Sound exposure level (SEL) for 1 second of continuous driving dB = Decibels RMS = Root mean square SEL=Sound exposure level				

Although the vibratory pile installation for the SB Jacoby Creek Bridge is not expected to result in physical injury to fish, the noise may be of sufficient level (> 150 dB_{rms}) to illicit potential behavioral response. Exceedance of the 150 dB behavior threshold could potentially disrupt feeding, delay migration, or flush fish from suitable habitat, potentially making them more vulnerable to predation.

Construction of the bridge abutments and pile installation may take one to two months between July 1 and October 15 during the first two years of construction (year one for construction of the detour bridge and year two for the final bridge alignment). Caltrans will implement a seasonal work restriction for pile installation to avoid exposing coho salmon, Chinook salmon, and steelhead. The work will be conducted during the summer months when juveniles are least likely to use the sloughs or streams within the action area, and are able to flee the immediate area affected by sound. The work window also avoids the late fall-winter migration period for adult salmon that may pass through the action area to spawn, and the spring-early summer smolt out-migration. Exposure to individual fish is expected to be low, and the few that could potentially be exposed would likely relocate to nearby suitable (and higher quality) habitat with adequate carrying capacity immediately upstream of the project site. Upon cessation of work, it is anticipated that fish movement and access would return to pre-construction conditions.

With implementation of the seasonal work window for pile installation, potential negative effects to individual coho salmon, Chinook salmon, and steelhead from vibratory pile driving would be insignificant. Furthermore, the work window avoids periods of juvenile and adult migration, therefore would not negatively affect safe passage conditions of coho salmon, Chinook salmon, and steelhead critical habitat. Green sturgeon are not likely to venture into the action area at Jacoby Creek, therefore would not be exposed to noise disturbance from bridge construction.

General Construction Noise and Visual Disturbance

General construction noise and visual disturbances from equipment and personnel operating near the project water courses also have the potential to disrupt feeding, delay migration, or flush fish from suitable habitat, potentially making them more vulnerable to predation.

The effects of general construction noise and visual stressors would be restricted to the immediate vicinity of bridge work, tide gate replacement and/or rock weir construction at Jacoby Creek, Old Jacoby Creek, Brainard Slough, Gannon Slough, and 101 Slough. At Old Jacoby Creek, 101 Slough and Brainard Slough, exposure would be limited to a two to four hour period at each site for one day to replace tide gates. At Gannon Slough, tide gate replacement and rock weir construction could take up to five days during year one or year two of the project. Bridge rail upgrades at Gannon slough could take as long as four months, with most of the work completed during the summer months and any overflow work conducted thereafter as weather permits. At Jacoby Creek, construction may take two to three years with most of the work completed during the summer of the first year.

Negative effects to the listed species from general construction noise and visual disturbance would be minimized with implementation of the avoidance and minimization measures. In addition to restricting all in-stream and pile installation activities to the period when fish are least likely to be present, a temporary visual barrier would be placed along the north and south banks

of Jacoby Creek within vicinity of the bridges to minimize visual disturbance to fish and prevent workers from crossing the creek outside of designated corridors. The contractor will also be required to install a temporary footbridge for workers to cross the creek without walking in the wetted channel.

Noise and visual disturbance will be minimized during pier removal of the old Jacoby Creek Bridge by conducting that activity during low tide (approximately four hours of operation per day for ten days). Piles will be cut with saws (with dust containment) or pneumatic hammers at or slightly above the waterline to minimize turbidity. This kind of equipment was used for pier removal at Ten Mile River in Mendocino County and the accumulated SEL over 5.25 hours of chipping was 178 dB, which was below the 183 dB threshold known to be injurious to fish.

To ensure that all minimization and avoidance measures are implemented, a biological monitor will be present during all in-stream activities associated with removal of the old SB Jacoby Creek Bridge and piers. The biological monitor will also ensure that the temporary footbridge and visual barrier is properly installed and maintained.

Exposure to individual salmonids is expected to be minimal given the low quality of summer rearing habitat within the action area. The few juveniles that may potentially be exposed could easily relocate to nearby suitable (and typically higher quality) habitats. Upon cessation of instream work, it is anticipated that fish movement and access would return to pre-construction conditions.

With implementation of the avoidance and minimization measures, potential negative effects to individual coho salmon, Chinook salmon, and steelhead from general construction noise and visual disturbances would be either discountable or insignificant. Furthermore, the work window ensures that project effects will avoid periods of juvenile and adult migration, therefore would not negatively affect safe passage conditions of coho salmon, Chinook salmon, and steelhead critical habitat. It is extremely unlikely that Green sturgeon venture into or inhabit the shallow channels of the action area waterways anywhere near the location of construction activity, and would therefore not be affected by general construction noise or motion.

Water Quality Effects

Pollutants in highway runoff or from construction operations and the mobilization of sediment both during and after construction all have the potential to impact water quality within the action area.

Turbidity and Sedimentation

Increases in suspended sediment or turbidity can affect water quality which in turn can affect fish health and behavior. Salmonids typically avoid areas of higher suspended sediment. Fish unable to avoid suspended sediment can experience negative effects, the severity of which increases as a function of the sediment concentration and exposure time.

Suspended sediment and turbidity generally do not acutely affect aquatic organisms unless they reach extremely high levels. At levels reaching 25 mg/L, suspended sediment can adversely affect the physiology and behavior of aquatic organisms and may suppress photosynthetic

activity at the base of food webs, affecting aquatic organisms either directly or indirectly. While benthic communities can normally withstand short term increases in suspended sediment, small increases over longer or continuous durations can affect the quantity and composition of aquatic invertebrates (i.e., prey species). Small increases in suspended sediment can also reduce the production of aquatic plants such as eelgrass, a component of essential fish habitat and critical habitat present within the action area in both the 101 Slough and Mad River Slough.

Behavioral effects of elevated suspended sediment on fish can include alarm reaction, abandonment of cover, and avoidance response. Sub-lethal effects can include reduction in feeding rates and success, physiological stress (increased respiration and coughing), and moderate habitat degradation (impaired homing). Lethal effects can include stress and tissue damage leading to reduced growth, increased predation, and mortality. Research has shown that length of exposure time to total suspended solids (TSS) plays a more dominant role than TSS concentration. Long term exposure to elevated TSS conditions may cause an endocrine stress response (elevated plasma cortisol, glucose, and hematocrits), suggesting an increased physiological burden that could influence growth, fecundity, and longevity.

Construction activities involving soil disturbance have the potential to discharge sediment. These activities include roadway construction, drainage modifications, construction of bridge abutments, and placement of rock for construction of the rock weir at Gannon slough. Workers walking within the channel at Jacoby Creek to remove bridge piers and maintain debris containment systems (and potentially within the other project water courses to position tide gates) could disturb substrates or dislodge soil along channel banks which may result in localized, short term increases in turbidity of the water column. It is considered short term because elevated turbidity is not expected to propagate more than 100 feet upstream or downstream or last for more than a single tide cycle. If tidal restoration is pursued at the Lanphere parcel, removal of the levee and placement of fill for construction of salt marsh could temporarily increase turbidity with the adjoining Mad River Slough. Lastly, there is potential for increases in sediment delivery post-construction if areas of soil disturbance are not stabilized and remain susceptible to erosion.

Any input of sediment to receiving waters within the action area could potentially affect the quality and functionality of substrates that provide for cover/shelter, the amount of space, water quality, food abundance, and safe passage conditions of coho salmon, Chinook salmon and steelhead critical habitat. Sediment and turbidity could also negatively affect the PBFs of water quality and food resources for green sturgeon critical habitat.

Sediment transport will be avoided or minimized through implementation measures contained in the standard specifications, special provisions, permit requirements, BMPs to stabilize all bare soil areas over both the short term and long term to avoid adverse effects to water quality, aquatic habitat, and listed fish, temporary construction site BMPs (including soil stabilization, sediment control, wind erosion control, tracking control, non-stormwater management, and waste management), and permanent BMPs (including the application of mulch, straw, stabilizing emulsion, fertilizer, and seed and tree planting to stabilize and re-vegetate all cut and fill slopes). Additionally, through project design, existing drainage patterns over vegetated fill slopes and swales will be maintained for bio-filtration treatment.

All areas disturbed during construction must meet the conditions included in the State Water Resources Control Board, Section D, Construction General Permit (Order No. 2010-0014-DWQ) in order to terminate permit coverage. All BMPs must continue to be inspected and maintained until the project has received a Notice of Termination (NOT) from the NCRWQCB. In addition, construction site monitoring, sampling, and analysis described in the approved SWPPP must continue until the NOT is certified. In order to receive the NOT, the project must demonstrate that final stabilization has been achieved by the following:

- Post-construction stormwater management measures have been installed and a long term maintenance plan has been established;
- There is no potential for construction-related stormwater pollutants to be discharged into site runoff;
- All construction-related equipment, materials, and any temporary BMPs no longer needed are removed from the site;
- Demonstrate via photos, inspection, testing, and analyses that all the above conditions have been met to demonstrate a minimum of a 70 percent stabilization of disturbed soil areas.

The proposed action is not likely to result in significant excursions of suspended sediment and turbidity that would result in acute physical or behavioral effects on individual coho salmon, Chinook salmon, steelhead, or green sturgeon, or significantly degrade PBFs of designated critical habitat. Sediment transport from areas of ground disturbance will be carefully managed through implementation of the avoidance and minimization measures. These measures include scheduling BMPs that avoid the most vulnerable periods of adult and smolt migration, and coincide with the period when juvenile salmonids are least likely to occur within the action area due to the low quality of summer rearing habitat.

While small amounts of turbidity could be generated when tides flood work areas, the increase in turbidity would be localized and short term (i.e., less than one tide cycle per day for no more than two weeks during any given construction season). The amount of turbidity potentially generated is not expected to significantly exceed existing background turbidity levels inherent in the shallow slough channels of Humboldt Bay created during wind events. Furthermore, turbidity and exposure to fish would be minimized by restricting in-stream activities to low flow and low tide periods (outside of significant precipitation events and between the latter two hours of outgoing tides and beginning two hours of incoming tides). If fish were present during the in-stream work period, they would have the ability and would be expected to flee to similar habitats of adequate quality and carrying capacity located within close proximity to project sites.

Pollutants Associated with Stormwater Runoff and Accidental Spills
Contaminants generated by traffic, pavement materials, and airborne particles that settle, may be carried by stormwater runoff into receiving waters, which may be taken up by aquatic organisms. Accidental spills of hazardous material such as that caused by highway-related traffic accidents or equipment refueling, maintenance, and fluid leakage near watercourses also poses a risk of contamination to aquatic habitat, depending on the type and quantity of the material spilled.

Exposure to stormwater pollutants can cause reduced growth, impaired migratory ability, and impaired reproduction in salmonids and other fishes, including green sturgeon. Contaminants in runoff can also be taken in by prey species, reducing prey availability or creating an indirect source of toxicity. The extent and severity of these effects vary depending on the extent, timing, and duration of the exposure; ambient water quality conditions; the species and life history stage exposed; pollutant toxicity; and synergistic effects with other contaminants.

Stormwater runoff can be a source of metals (e.g., copper, zinc, cadmium, lead and nickel) to surface waters. Of these, copper and zinc are of particular concern due to their effect on salmonids at low concentrations. Dissolved copper and zinc in stormwater road runoff are difficult to remove, are biologically active at low concentrations, and have known negative effects on salmonids and other fishes. Dissolved copper can hurt salmonids by inhibiting their olfactory system, thereby decreasing their predator avoidance behavior. The toxicity of zinc is widely variable, dependent upon concurrent levels of calcium, magnesium, and sodium in the water column. Zinc toxicity studies reveal effects including reduced growth, avoidance, reproduction impairment, increased respiration, decreased swimming ability, increased jaw and bronchial abnormalities, hyperactivity, hyperglycemia, and reduced survival in freshwater fish. Juveniles are more sensitive to elevated zinc concentrations than adults.

Another primary pollutant of concern in stormwater runoff is a class of compounds called polycyclic aromatic hydrocarbons (PAHs). PAHs are ubiquitous marine and freshwater sediment contaminants, frequently detected in sediments of industrialized embayment's worldwide. The majority of PAHs originate from petroleum and combustion products. Sources can include industrial discharges, creosote from treated wood, municipal run-off, asphalt, and atmospheric emissions from incineration and automobile emissions. PAHs are also introduced into marine systems through accidental spills of fuel oil, crude oil, and other petroleum products, and from non-point sources like vehicle emissions. PAHs are known to cause cancer, reproductive anomalies, and immune dysfunction; impair growth and development; and other impairments in fish exposed to sufficiently high concentrations over periods of time. It is recognized that roadways contribute pollutants such as PAHs into waterways through direct inputs via vehicular wear and use and by transporting anthropogenic atmospheric sources; however, Caltrans' stormwater sampling results show very little (mostly non-detected) PAHs in stormwater runoff.

In regard to extent, timing and duration of exposure, it is important to note that contaminants are not washed from road surfaces evenly over time during a rainfall event. In California, a lengthy dry season leads to an annual build-up of pollutants on highway surfaces, which are progressively washed off as the wet season progresses. This phenomena is known as a "seasonal first flush" effect. The first flush effect results in higher concentrations of pollutants in runoff from the initial phases of a storm and during the early part of the storm season (following periods of little or no precipitation). Total rainfall volume, rainfall duration, and rainfall intensity have been correlated to decreased pollutant levels, likely due to dilution. The greatest risk of potential contaminant exposure to aquatic species would likely be at the onset of the rainy season (mid-October or November). Adult or juvenile salmonids attempting to enter the project watercourses may avoid or delay migration or redistribution if contaminant concentrations were high enough to trigger an avoidance response

In 2010, Caltrans performed a water quality analysis of the highway construction elements of the proposed action concluding that with the regulatory control measures currently in place and implementation of BMPs, the proposed action is not likely to adversely impact water quality. The water quality analysis did not address the wetland restoration at Lanphere Parcel and Samoa Parcel. Additional water quality studies will be performed for this component of the proposed action once the restoration plan is finalized; however, no paving or increase in impervious surface is proposed. Existing vegetated slopes that provide bio-filtration treatment of stormwater runoff within the action area will be perpetuated (retained and maintained). The area climate, soils, and slopes provide near ideal conditions to sustain dense vegetation growth for bio-filtration treatment BMPs. These BMPs have been demonstrated to be effective for reducing impacts to water quality from similar stormwater runoff to non-significant levels. The remaining vegetated slopes, and new vegetated slopes after construction, will continue to perform adequate bio-filtration for stormwater runoff. In some locations, including the Indianola Interchange, the proposed increase in vegetated fill slope will allow for greater clearance of the roadway from adjacent wetlands and waters. This, along with removal and restoration of existing paved median crossings, will result in a net increase in bio-filtration within the action area post construction. Stormwater runoff from project area bridges do not drain directly into watercourses that support fish habitat, but rather into vegetated swales that provide bio-filtration and dilution prior to reaching watercourses. After construction, stormwater conveyance systems and permanent erosion control measures will be maintained in compliance with the Caltrans Storm Water Management Program (SWMP).

Studies found that effects from runoff are essentially unperceivable when less than about 5 percent of the watershed is impervious. The proposed project does not constitute a significant increase in impervious surface within the affected watersheds. The estimated additional 2.31 acres of asphalt paving in the Freshwater and Jacoby Creek watersheds (combined area of 30,938 acres) represents a 0.007% increase in impervious surface. The approximate 2.94-acre increase of impervious surface due to asphalt paving (~1.79 acres) and concrete cable rail pad (~1.15 acres) within the Gannon Slough drainage area represents an approximate 0.20% increase in impervious surface within the combined watersheds of Campbell Creek, Beith Creek and Grotzman Creek (1,460 acres). Considering the small increase in impervious surface compared to the total proportion of impervious surface that could contribute to chemical contamination throughout these watersheds, the probability of any impact to salmonids, green sturgeon and their designated critical habitat is highly unlikely and therefore discountable. The new road surface will be composed of the same OGFC concrete asphalt as the existing surface. Therefore, no change in baseline concentrations of contaminants related specifically to the road surface material is expected.

Furthermore, when evaluating other areas, Caltrans researchers found that impervious fraction of a drainage area did not have a consistent effect on contaminant concentrations. Impervious fraction had the weakest effect of all the factors evaluated. Conversely, traffic volume showed the strongest effect of all factors evaluated. This finding makes sense considering that contaminant deposition occurs primarily due to wear of tires, brake pads, and pavement, as well as exhaust emissions and fluid leaks rather than from unworn asphalt pavement. However, the proposed action is not expected to generate an increase in traffic volume; accordingly, traffic-generated runoff associated with the project can be expected to provide the same pollutant

loading as is experienced presently. The current and expected pollutant loading would be rendered insignificant due to biofiltration from vegetated areas adjacent to the roadway.

Accidental spills from construction equipment pose a risk to water quality, particularly for construction activities in or near watercourses, and at the onset of the rainy season when the first flush could exasperate the discharge of spilled materials. However, in-stream activities will be restricted to the dry season when the fewest individuals would be expected to occur within the action area. In-stream activities will be suspended and all construction areas stabilized prior to the onset of the rainy season. Furthermore, the avoidance and minimization measures will prevent most, if not all, chemical contamination during construction. Equipment fueling will not occur within 50 feet of surface water, equipment and hazardous materials will be stored at least 50 feet from surface water, non-toxic vegetable oil will be used in hydraulic equipment, and all equipment will be washed and inspected for leaks prior to working within 50 feet of stream channels and riparian areas periodically during the day. During construction, the pavement may accumulate chemicals from construction equipment that could run off during rain events; however, BMPs will be in place and the existing vegetated swales will readily filter any slight increase in runoff and associated chemicals.

With implementation of the avoidance and minimization measures, including the use of pollution prevention plans, localized degradation of water quality from construction related spills is unlikely. The proposed avoidance and minimization measures are expected to be sufficient to restrict the pollutants to the immediate area; therefore, chemical contamination of the project watercourses as a result of construction operations is extremely unlikely to occur and the potential effects to salmonids are discountable.

Furthermore, the proposed action is intended to improve traffic safety, thereby reducing the potential for accidents and spills as compared to the baseline (existing) condition. Therefore, the proposed safety improvements are considered a beneficial effect.

Aggregated or Synergistic Effects

Aggregated or synergistic effects pertain to effects arising between two or more project impacts that produce an effect greater than the sum of their individual effects. These effects can result from individually minor but collectively significant actions taking place over a period of time. The timing of project activities avoids many coincident or compounding effects to listed species and critical habitat. For instance, the removal of bridge piers in Jacoby Creek would be conducted following bridge construction, thereby eliminating the potential compounding effects of turbidity from workers walking within the channel and noise or visual disturbance from bridge construction (e.g., vibratory pile driving, bridge rail upgrades, etc.). Also, night lighting would not be used when vibratory pile driving is conducted on the banks of Jacoby Creek. Some individually insignificant or discountable effects may be coincident.

Even when combined, the potential negative effects of the proposed action to the listed fish and critical habitat are considered negligible given the scale of those effects. Additionally, project activities will take place during the period when the least number of fish would be expected to be present or exposed (i.e., summer low flow / low tide events). The risk of exposure to individual fish from project impacts is considered extremely low given the poor quality of the rearing

habitat within the action area and timing of project activities. Therefore, all direct or indirect individual, aggregated, or synergistic effects to salmonids, green sturgeon and critical habitat from the proposed action would likely be discountable or insignificant.

Effects to Pacific Coast Salmon EFH

Caltrans states that project impacts to EFH are similar to effects to critical habitat described above for SONCC coho salmon and CC Chinook salmon. Caltrans (2015a, 2015c) concluded that the proposed action "may adversely affect" EFH for Pacific Coast salmon within the action area waterways.

Consultation History

Endangered Species Act

On February 17, 2016, NOAA's NMFS received a BA and letter from Caltrans requesting informal consultation and written concurrence that their proposed Eureka Arcata Corridor Improvement Project is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA)

On February 17, 2016, NMFS received written confirmation from the FHWA that Caltrans can perform informal ESA consultation on their behalf. And, on February 18, NMFS received confirmation from Caltrans that the Project is funded, at least in part by the FHWA federal funding, whereby creating a federal nexus subject to ESA section 7 consultation.

On February 23, 2016, NMFS received from Caltrans clarification about the wetland restoration component of the Project. Specifically, Caltrans provided written explanation of the mitigation credits that are proposed for the Lanphere Parcel and Samoa Parcels. Also, Caltrans explained that they analyzed both the full and muted tidal restoration approaches; and the full tidal restoration do not require fill because sediments can accrete to create saltmarsh. However, to speed the development of salt marsh, Caltrans may elevate the grade with fill to some degree. Lastly, Caltrans described the risk of exposure of listed species within Mad River Slough being low from proposed levee reconstruction and armoring activities.

On March 1, 2016, NMFS received from Caltrans written supplemental information pertaining to the design process and regulatory requirements associated with Caltrans' water quality program. Caltrans stated that all project BMPs are considered and designed in accordance with the current Project Planning and Design Guide (PPDG) (last updated May 2012). Caltrans explained that the PPDG details the process of selecting BMPs to comply with the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (No. CAS000003).

On March 7, 2016, NMFS received from Caltrans a written reconciliation of a statement made in the BA regarding the potential effect of maintenance activities performed in accordance with the Maintenance Staff Guide.

On March 9, 2016, NMFS received from Caltrans a written declaration that Caltrans will not oblige NMFS to provide technical assistance or approve consultants to implement the proposed action. Caltrans expressed understanding that NMFS does not intend to approve any Caltrans

consultants, or otherwise participate as a federal action agency to fund, authorize or carry out the proposed action.

On March 21, 2016, NMFS received from Caltrans written clarification regarding a reference made in their BA to Standard Specifications and BMPs. Also, Caltrans confirmed that a Water Pollution Control Program is not required. Caltrans directed NMFS to their 2010 Water Quality Assessment which identifies specific BMPs that are applicable to proposed construction activities.

On April 7, 2016, NMFS received from Caltrans further clarification about the Caltrans project planning process. Caltrans explained to NMFS that they plan to complete consultations (i.e., ESA and MSA) with NMFS prior to finalizing the National Environmental Policy Act document. More importantly, Caltrans stated that the description of the effects of the action contained in their BA and ultimate determination do not rely on the outcome of future permits they intend to obtain from state or federal agencies. On a separate topic, Caltrans clarified that proposed levee removal associated with wetland restoration would allow fish access to areas designated as critical habitat for salmonids. It is not within Caltrans' authority or intent to designate critical habitat as their BA may have erroneously indicated.

On April 27, 2016, NMFS received a written account of anticipated temporary and permanent impacts to wetland areas; and supplemented their description of effects of the action associated with certain aspects of wetland impacts.

On April 28, 2016, NMFS received written clarification from Caltrans regarding their April 27, 2016, accounting of loss of wetland anticipated from implementing the proposed action. Caltrans confirmed that vegetation would be temporarily "negatively affected" by construction foot traffic and equipment staging along the highway shoulder and median.

Magnuson-Stevens Fishery Conservation and Management Act
On February 17, 2016, Caltrans also requested consultation on essential EFH for species managed under the Pacific Coast Salmon Fishery Management Plan, Pacific Groundfish, and Coastal Pelagic Species pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1855(b).

ENDANGERED SPECIES ACT

Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

The designations of critical habitat for southern DPS of North American green sturgeon, SONCC coho salmon, CC Chinook salmon, and NC steelhead use the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replaces this term with physical or biological features (PBFs). This shift in terminology does not change the approach used in conducting our analysis, whether the original designation identified primary constituent elements, physical or biological features, or essential features. In this LOC, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat, and vice versa.

In their BA, and subsequent written clarification made to NMFS regarding the contents of the BA, Caltrans presented the results of an analysis they conducted of the possible impacts that could arise from authorizing, funding or carrying out the Project. Caltrans' examination of possible effects of the action on several ESA-listed species and critical habitat include consideration of the available scientific and commercial information relevant to the Project. This information was synthesized in the Federal Action Agency's Effects Determination section (above). NMFS is in agreement with the reasoning and determinations discussed in that section.

Conclusion

NMFS concurs with Caltrans that the proposed action may affect, but is not likely to adversely affect federally listed SONCC coho salmon, CC Chinook salmon, NC steelhead, Southern DPS of North American green sturgeon or their individual designated critical habitat.

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by Caltrans or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Under the MSA, this consultation is intended to promote the protection, conservation and enhancement of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10), and "adverse effect" means any impact which reduces either the quality or quantity of EFH (50 CFR 600.910(a)). Adverse effects may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Caltrans determined that the proposed action "may adversely affect" EFH for Pacific Salmon (SONCC coho salmon and CC Chinook salmon), Pacific Groundfish, and Coastal Pelagic Species within the action area waterways. Drawing from information in Caltrans' Essential Fish

Habitat Assessment, which incorporates information from the BA to address possible adverse effects on Pacific Salmon, NMFS determined that the proposed action would adversely affect Pacific Salmon, Pacific Groundfish, and Coastal Pelagic Species EFH, as follows:

1. Increased underwater noise and motion disturbance.
2. Decreased water quality (increased turbidity, suspended sediment, chemical pollution, and salinity).
3. Reduced aquatic and riparian vegetation, including eelgrass (no loss of eelgrass habitat function).

The manner in which these adverse effects would occur is described above in the summary of the action agency's analysis. Although we have concluded that the proposed action would adversely affect EFH, there are no practical measures that could be taken to further minimize or avoid those effects than already incorporated into the design and proposed by Caltrans. Therefore, we are not providing EFH Conservation Recommendations at this time.

Please direct questions regarding this letter to Clarence Hostler in our Northern California Office in Arcata, California at 707-825-5165 or via e-mail at Clarence.Hostler@noaa.gov.

Sincerely,

for

William W. Stelle, Jr.
Regional Administrator

cc: Sean Oliver, Federal Highway Administration
NMFS file #151422WCR2015AR00101

Appendix J Eureka to Arcata Corridor Improvement Project Conceptual Wetland Mitigation Plan

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Eureka to Arcata Corridor Improvement Project
Conceptual Mitigation Plan

April 2011

INTRODUCTION

The California Department of Transportation (Caltrans) is proposing to construct the Eureka to Arcata Corridor Improvement Project (project) a roadway improvement project, that after avoiding and minimizing impacts to aquatic resources to the greatest extent possible, will result in unavoidable impacts to approximately 8.2 acres of United States Army Corps' of Engineers (ACOE) jurisdictional wetland (based on construction of the project's Preferred Alternative - Modified Alternative 3A). The roadway project is within the coastal zone.

Information provided within this conceptual mitigation plan will establish Caltrans' ability to successfully provide adequate compensatory mitigation for the proposed project. This conceptual mitigation plan has been prepared in conformance with the National Environmental Policy Act 404 Memorandum of Understanding (NEPA 404 MOU) between the ACOE and the Federal Highway Administration (FHWA). This plan identifies the extent and nature of proposed mitigation *in general terms* as per the NEPA 404 MOU, while also providing substantial addition information as requested by the ACOE San Francisco District, Woodley Island Office.

As proposed, a higher value wetland (exhibiting greater functionality and service than the impact site) will be provided as mitigation thus yielding a net increase in aquatic resource function and satisfying the national policy for "no net loss of aquatic function". For the proposed roadway project, Caltrans anticipates receiving a 1:1 mitigation ratio from the ACOE. However, other regulatory agencies may require a 2:1 mitigation ratio.

This report will demonstrate that proposed restoration can provide ample mitigation credits. In fact, we believe that the restoration conceptualized in this plan will generate credits far in excess of those needed for the project. We currently estimate that perhaps as many as 45 acres of credit could be generated by our proposal, and therefore are likely to pursue the establishment of an ACOE approved mitigation bank. Our conceptual plan proposes the wetland restoration of two Caltrans-owned parcels (Demello and Old Samoa).

Project Impact by Habitat Type, Plant Community, Baseline Function

Impacts to wetlands habitats have been identified based upon the Cowardin classification system (Cowardin, 1979). Plant communities were documented by the project biologist. A functional assessment of the impacted wetlands by habitat type, was performed using the Wetland Evaluation Technique (WET). The WET is a comprehensive approach for evaluating individual wetlands that was developed in 1983 for the FHWAand later revised under the auspices of the ACOE (Adamus and others, 1987 and 1991). The WET determines a functional capacity rating based upon high/low ranking criteria for the following 11 individual wetland functions/values: groundwater recharge; ground water discharge; flood

flow alteration; sediment stabilization; sediment/toxicant retention; nutrient removal/transformation; production export; wildlife diversity/abundance; aquatic diversity/abundance; uniqueness or heritage value, and recreation value. The WET analysis determined that Palustrine Emergent Wetland in the project area has a low, low/moderate functional capacity, while the Estuarine Tidal and Subtidal Habitats exhibit moderate functional capacities. A table of the WET analysis is provided as an attachment to this plan. (See Attachment 1, WET Analysis.)

Project Impact – The project will permanently fill 8.1 acres of Palustrine Emergent Wetland. The permanent fill of Palustrine Emergent Wetland would occur from the project's lane construction (proposed lengthening of exceleration/deceleration lanes at intersections), installation of addition shoulder backing, and construction of a new interchange. These to-be-filled areas consist of long, narrow strips of wetlands on the shoulders, and along the median, of a four-lane divided highway, over a distance of about 10 miles. These wetlands were substantially degraded historically, through the construction of railway fills and levees that transformed the wetlands in the project area (and nearly the entire bay area) from a tidally influenced bay system to a freshwater system.

Vegetation/Plant Community – These roadside wetlands are comprised primarily of non-native grasses, with sweet vernal grass (*Anthoxanthum odoratum*) and tall festuca (*Festuca arundinacea*) being the dominant species (Gail Popham, project biologist, pers. comm 4/5/11).

Baseline Function – The functional capacity of these freshwater wetlands is compromised by several factors including: their location beside, and between, a four-lane divided roadway; the previous historic conversion from their natural state as a tidally influenced wetland to a freshwater system; and, their routine mowing for roadway maintenance reasons. These wetlands exhibit poor functionality related to production export, wildlife diversity/abundance, aquatic diversity/abundance, uniqueness or heritage value, and recreation value. The WET analysis shows that these wetlands have an overall low/low-moderate function and service capacity. (See WET Analysis, Attachment 1).

Project Impact – The project will permanently fill an area of 0.1 acre of Estuarine Intertidal Unconsolidated Shore Wetland. This impact is associated with the southbound Jacoby Creek bridge construction and access.

Vegetation/Plant Community – Estuarine Intertidal Unconsolidated Shore Wetland in the project area exhibits a plant community dominated by sedges, including Lyngbye's sedge (*Carex lyngbyei*, a CNPS List 2 species). (Gail Popham, project biologist, pers. comm 4/5/11).

Baseline Function – The area provides production export for aquatic vertebrates and invertebrates, as well as rearing and hiding habitat. Futher, the substrate supports a

rare plant (Lyngbye's sedge). Based on the wetland functional analysis this wetland exhibits moderate function/service capacity. (See Attachment 1).

Project Impact – The project will permanently fill an area of 0.01 acre of Estuarine Subtidal Unconsolidated Bottom Aquatic Habitat. This impact is associated with areas of construction and access on the banks of Jacoby Creek and tidal overflow areas within the roadway median.

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Vegetation/Plant Community – Within the project area, Estuarine Subtidal Unconsolidated Bottom Aquatic Habitat supports no vegetation or plant community. (Gail Popham, project biologist, pers. comm 4/5/11).

Baseline Function – The affected area of Jacoby Creek provides refugia, rearing and foraging habitat for federally listed salmonids, as well as breeding, rearing and foraging habitat for the federally listed tidewater goby (*Eucyclogobius newberryi)*[1]. Based on the wetland functional analysis this aquatic site exhibits moderate function/service capacity. (See Attachment 1).

Net Effect to Aquatic Function – Overall the proposed project will not change hydrology supporting wetland vegetation. Since wetland impacts will primarily be sliver fills on previously degraded wetland located within the existing highway medians and shoulders, the loss of wetland value and function will not be substantial. Consequently the functionality of remaining wetland in the project study area will be comparable to the pre-project condition. Because project impacts to wetland function are minor, after implementation of mitigation the proposed project is not expected to result in, or contribute to, substantial negative indirect or cumulative impacts on wetland resources in the project study area.

For both the impact site and the proposed mitigation site, the net effect to wetlands was further assessed utilizing eight wetland functions and services that are considered important to the public interest, as described by 33 CFR Section 320.4(b). 8.1 wetland acres, out of a total proposed 8.2 wetland acres to-be-filled, contain none of the eight functions/services considered to be important (see Table 1, page 4). This analysis combined with our discussion on Proposed Mitigation (below) clearly demonstrates that the proposed mitigation will achieve an expansion of wetland function and service.

PROPOSED MITIGATION

Caltrans has had many discussions with various federal, state and local agencies, land trusts, restoration professionals, and private landowners in an effort to identify potential mitigation properties for the proposed project as well as to collaborate and build upon local and regional wetland restoration planning activities (see Attachment 2, Mitigation Options Pursued).

[1] Minimization and avoidance measures have been implemented to the maximum extent practicable to avoid impacts to listed species. The project's Section 7 consultations have resulted in the following determinations - "May Affect, Likely to Adversely Affect" federally listed tidewater goby; and "May Affect, Not Likely to Adversely Affect" federally listed salmonids. (Gail Popham, project biologist, pers. comm 4/5/11).

Table 1 – Potential Functional Gain as per 33CFR 320.4(b) Criteria.

Wetland Function/Service	Impacted Wetland/Water	Proposed Wetland Mitigation
i) Does wetland serve significant biological function?	**No**, 8.1 acres (of a total impacted 8.2 acres) serve no significant biological function. **Yes**, 0.1 acre of impacted aquatic resource serves a significant biological function.	**Yes**, upon restoration. Restored wetland will provide habitat for rare and protected species.
ii) Is wetland set aside for aquatic study or as a refuge or sanctuary?	**No**, wetlands are within working roadway right-of-way.	**Yes**, upon restoration. Once mitigation is deemed successful, the areas will be added to adjacent public refuges.
iii) Will impact to wetland detrimentally affect natural drainage or sedimentation patterns, salinity distribution, flushing characteristics or current patterns?	**No**.	**No**, impact will be positive. Restoration will re-create natural hydrology and drainage patterns.
iv) Do wetlands shield other areas from wave action, erosion or storm damage?	**No**.	**Maybe**, upon restoration.
v) Do wetlands serve as valuable storage areas for storm or flood waters?	No.[2]	No.
vi) Do wetlands provide groundwater discharge at a minimum baseflow that is important to aquatic resources, or provide prime recharge?	No	No.
vii) Do wetlands provide significant water purification?	No.	No.
viii) Are wetlands unique in nature or scarce in quantity to the region or local area?	**No**, (for 8.1 acres) degraded former tidelands are ubiquitous in the region and local area. **Yes**, (for 0.1 acre) estuarine habitats are limited.	**Yes**, upon restoration. Proposed mitigation will result in restoration of regionally significant and unique wetlands.

[2] Wetland functions iv), v), and vi) are not applicable to either the impact wetland or the proposed mitigation site as both areas are located at an approximate 10' elevation above sea level.

After much study and Agency input, Caltrans proposes to perform wetland restoration on two parcels referred to as the Demello parcel and the Old Samoa parcel. The parcels are located in the northern Humboldt Bay area of Humboldt County, California - in near vicinity to the project impact site. See Exhibit 1, Vicinity Map, page 16. Proposed restoration parcels are similar to the project impact site in that wetlands present are diked and drained former tidelands currently expressing degraded freshwater wetland features. The Demello and the Old Samoa parcels offer an opportunity to perform up to 84 (eighty-four) acres of wetland restoration, as well as four acres of upland buffer restoration. See Table 2, below.

Table 2 – Potential Restoration, Both Parcels Combined.

	Demello South	**Old Samoa Parcel**	**Mitigation Totals**
Re-establish Wetland	15.5 acres	---	**15.5 acres**
Rehabilitate Wetland	22.2 acres	36.3 acres	**58.5 acres**
Rehabilitate Riparian Wetland	10.0 acres	---	**10.0 acres**
Subtotal wetland restoration = 84.0 acres			
Rehabilitate Upland Buffer	4.0 acres	---	**4.0 acres**

Watershed Context of Habitat and Plant Communities to be Replaced

Historically, Humboldt Bay was ringed by thousands of acres of tidal salt marsh and brackish wetland. It is probable that freshwater wetlands played a minor role in the overall wetland acreage, and were likely expressed as a narrow band of transitional habitat between brackish wetlands at the tidal fringe and the downslope extent of coniferous forest. In the 1880's however, the process of diking the tidal wetlands for conversion to agriculture began. This conversion of wetlands to pasture land was accelerated by construction of the Northwestern Pacific Railroad in 1901 and subsequent placement of tide gates, which further restricted tidal influence over adjacent lands. It is estimated that 90% of the historic Humboldt Bay saltmarsh was lost.

Today, the vast majority of Humboldt Bay wetlands are seasonally-saturated agricultural parcels dominated by exotic pasture grasses and can be classified as degraded Palustrine Emergent wetland. Few areas of functional tidal wetland/aquatic habitat or freshwater fringe riparian habitat remain.

A like-for-like mitigation approach for the project would create 8.2 acres of low/low moderate functional capacity wetland. However, as previously discussed the Humboldt Bay area has an overabundance of poorly functioning wetlands. Instead, Caltrans proposes to increase wetland functions that are critical for maintaining and improving the ecological function of the Humboldt Bay watershed.

Proposed mitigation will likely restore both tidelands and highly-functioning freshwater wetland. Proposed mitigation is at the same elevation as the impact site and within the same watershed. Compensatory mitigation will be accomplished through restoration of wetlands which are not narrow linear bodies located adjacent to a roadway; these areas therefore offer the potential for a greatly enhanced wetland functions and services as opposed to the impact site. Proposed mitigation will provide a suite of functions and services that are currently non-existent to negligible, as well as impracticable to implement, at the impact site. Proposed mitigation is of regional significance and ties into regional conservation plans.

DEMELLO PARCEL

The 78-acre Demello parcel is located west of the City of Arcata, at the end of Lanphere Road. The parcel is within the coastal zone. See Exhibit 2, Parcel(s) Location Map, page 17. The parcel was selected in part, because of its location adjacent to the United States Fish and Wildlife Service (USFWS) Humboldt Bay National Wildlife Refuge's Lanphere and Ma-le'l Dunes Units. (See Exhibit 3a, Parcel Adjacency to Other Public Resource Lands, page 18).

The Demello parcel is zoned Agricultural Exclusive within a combining zone for archeological resource area, beach and dune, flood hazard and transitional agricultural lands. The agricultural soils are non-prime. Proposed mitigation is compatible with adjacent land use and will enhance the ecologic value of adjacent natural resource properties.

Description of Site Conditions

Most of Demello is a former tideland situated behind a levee and is sandwiched between the Mad River Slough and the Pacific Ocean. The 78-acre parcel is dominated by an approximate 38.5-acre pasture (utilized for cattle grazing). Per the wetland delineation performed by Caltrans and verified by the ACOE, the parcel contains approximately 16.3 acres of upland (including an approximate 0.8-acre relict dune[3]) and approximately 22.2 acres of grazed wetland (degraded Palustrine Emergent Wetland that includes 2.0 acres of low-quality brackish marsh [present due to leaking tide gate]). The parcel also includes 5.2 acres of freshwater marsh which transitions into approximately 10 acres deciduous swamp/riparian wetland. Additionally the parcel contains 16 acres of coniferous dune forest and a minor amount of extant upland dune habitat. The remainder of the acreage (approximately 11+ acres) consists of the existing levee at Mad River Slough, intertidal and

[3] All but the relict dune, would qualify as coastal (one-parameter) wetland.

subtidal habitats within the slough itself (east of the levee), the access road and a parking area[4]. See Exhibit 4a, Demello Parcel Existing Conditions, page 20.

The grazed wetland pasture is limited to a single herbaceous canopy layer that is dominated by commercial forage species such as tall fescue (*Fescue arundinacea*), ryegrass (*Lolium perrene* and *L. multiflorum*) and clover (*Trifolium repens*). Large areas of this grazed wetland exhibit a mosaic pattern of wetland/non-wetland vegetation, with 22% of the pasture expressing a predominance of non-native, non-hydrophytic vegetative cover. Grazing of cattle occurs during the months April through October. Over winter, migratory ducks, geese and shorebirds make use of the site.

Historic conversion from tidally influenced wetlands to a freshwater system, current land management practices (cattle grazing) and man-induced site drainage, compromise natural wetland functions at the site. Invasive species such as *Spartina densiflora* and bull thistle (*Cirsium vulgare*) are gaining foothold within the pasture and wet ditches. See Figure 1, site photos, page 22.

(Significantly greater detail on the parcel's extant wetland vegetation, hydrology, soils and topography can be found in the Old Samoa and Demello South Parcels Wetland Delineation Report, verified by the ACOE on March 23, 2010.)

#1) PROPOSED MANAGEMENT ACTION – Restore Wetland, approximately 37.7 acres.

Within the agricultural area of the parcel, wetland restoration would consist of the 38.5 acres of wet pasture, minus the 0.8-acre relic dune. It is believed approximately 15.5 acres of wetland could be re-established in areas that delineate as uplands. The remaining 22.2 acres of wet pasture are proposed for wetland rehabilitation, and include 2.0 acres of low-quality brackish marsh, 5.2 acres of freshwater marsh, and 1.3 acres of wet ditch. Wetland restoration approaches thought to be possible include freshwater wetland expansion, a muted tidal restoration of salt marsh habitat, or a full-tidal restoration of salt marsh habitat[5], options A-C below.

<u>General Hydraulic Considerations</u>

A - *Freshwater Restoration*: wetlands could expanded by reestablishing hydrology in upland areas of the pasture by implementing excavation and/or grading and by decommissioning ditches and tide gates that serve to collect and drain water off-site. In addition to greater acreage of seasonally wet meadow, it is likely that greater expanses of both freshwater marsh and brackish marsh would develop on-site (brackish marsh is currently present due to a leaking tide gate). Deeper water habitats could be developed (excavated/graded) for

[4] Note: Overall acreages are based on aerial photo interpretation and a working knowledge of habitats at the parcel. Acreages are subject to ground truthing.

[5] As part of developing a final restoration design and mitigation plan the following will occur to further guide a freshwater, tidal, or muted tidal restoration design: tidal data will be developed; topographic surveys will be performed, and water-monitoring wells will be installed.

migrating waterfowl. In freshwater habitats, native wet meadow species and grasses could be restored, replacing introduced grasses and forbs. Brackish marsh species could be restored in brackish habitats. Within the wetlands, existing infestations of reed canary grass (*Phalaris arundinacea*) would be eradicated.

Management strategies could potentially be developed to manage the area for the benefit of the Aleutian cackling goose (*Branta hutchinsii*)[6]. Managing for Aleutians requires short-grass foraging habitat and would entail the use of seasonal cattle grazing or hay production. Within areas retained in short-grass pasture, management prescriptions could be developed for grazing/hay production to benefit water quality. See conceptual rendering: Attachment 3 #1 Proposed Management Action, A - *Freshwater Restoration*.

B - *Tidal Restoration*: to achieve a full tidal restoration, the levee along the parcel's east boundary, fronting the Mad River Slough, would be decommissioned. Elevations on the parcel may need to be raised to facilitate the development of salt marsh habitat rather than mud flat[7]. Further, new dike construction on the parcel would likely be necessary to protect both a private parcel to the south, as well as important riparian habitat along the parcel's west boundary. A full tidal approach at the site would result in the restoration of natural historic function, as well as create habitat for special-status species[8]. Providing salt marsh at the site would result in high quality habitat for fish, salt marsh plants and animals. See conceptual rendering: Attachment 3, #1 Proposed Management Action, B - *Tidal Restoration.*

C- *Muted Tidal Restoration:* a muted tidal approach would result in a restoration of partial historic function. This would allow the creation of habitat for the federally listed tidewater goby (*Eucyclogobius newberryi*) as well as rare plants. This approach would entail the use of special tide gates as well as some excavation for creation of estuarine slough habitats. A muted tidal design would also be likely to include design features to protect and expand the adjacent riparian habitat. See conceptual rendering: Attachment 3, #1 Proposed Management Action, C- *Muted Tidal Restoration.*

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<u>Species to be Used</u>

Plant species to be utilized for restoration will be determined upon final restoration design/approach (freshwater, tidal, muted tidal). However, potential species to be targeted for restoration could include willow (*Salix hookeriana* and *S. sitchensis*), alder (*Alnus rubra*), Pacific wax myrtle (*Myrica californica*), Nootka rose (*Rosa nutkana* var. *nutkana*) and other native shrubs, as well as native sedges and grasses such as panicled bulrush (*Scirpus microcarpus*) and water foxtail (*Alopecurus geniculatus*). For brackish and tidal

[6] The Aleutian goose is a former Federal threatened/endangered species that was successfully de-listed in March 2001.

[7] Results from to-be-performed restoration design studies will allow us to determine final elevations (see footnote #5).

[8] Such as Humboldt Bay owl's clover (*Castilleja ambigua* ssp. *humboldtiensis*) and Point Reyes bird's beak (*Cordylanthus maritmus* ssp. *palustris*) both California Native Plant Society List 1B species - species rare in California and elsewhere.

areas saltmarsh species such as pickleweed (*Sarcocornia pacifica*), salt grass (*Distichlis spicata*), Humboldt Bay owl's clover (*Castilleja ambigua* ssp. *humboldtiensis*) and Point Reyes bird's beak (*Cordylanthus maritmus* ssp. *palustris*) would be targeted for restoration.

#2) PROPOSED MANAGEMENT ACTION – Restore Riparian Wetland, 10.0 acres.

The existing swath of deciduous swamp/riparian wetland along the parcel's west boundary has been identified as one of the richest areas for migrating songbirds in the state (source: personal communication to Andrea Pickart [USFWS Ecologist] from C. J. Ralph [United States Forest Service Research Ornithologist]).

Previous owners of the parcel have not managed this riparian area to the benefit of wildlife or plants. There are gaps with no tree canopy and areas of short canopy that could be restored (re-habilitated) by implementing plantings of appropriate native species allowing for a multi-layered canopy. Invasive grasses and forbs that are present on the road side of the riparian corridor could be converted to native species that provide wildlife food sources. In addition to restoring the existing riparian, this significant habitat area could be expanded to the east replacing open pasture, though a cessation of grazing and implementation of restorative plantings. See conceptual rendering: Attachment 3, #2 Proposed Management Action, Restore Riparian Wetland.

<u>Species to be Used</u>
Species to be utilized in the riparian wetland area may include willow (*Salix hookeriana* and *S. sitchensis*), alder (*Alnus rubra*), Pacific wax myrtle (*Myrica californica*), Nootka rose (*Rosa nutkana* var. *nutkana*) and other native shrubs, as well as native sedges, such as panicled bulrush (*Scirpus microcarpus*).

#3 PROPOSED MANAGEMENT ACTION – Restore Important Upland Buffer, 4.0 acres.

Per the Mitigation Rule, upland buffers may provide habitat or corridors necessary for the ecological functioning of the aquatic resource. Where necessary to ensure the long-term viability of the aquatic resource, compensatory mitigation credit will be provided for those buffers (CFR 323.3(g)(2)(i)).

By implementing restorative plantings, a relict dune that is currently used for grazing could be restored to coniferous dune forest (approximately 0.8 acre), a rare and declining habitat type[9]. Another approximate 3.0 acres of coniferous dune forest, west of the road, would benefit from the removal of exotic vegetation (English ivy [*Hedera helix*]) and the restoration of native upland species. Native upland vegetation will act as a wetland buffer due to its adjacency to created and restored wetlands. See conceptual rendering: Attachment 3, #3 Proposed Management Action, Restore Important Upland Buffer.

[9] This forest type is considered to be a rare and declining habitat by the CDFG.

Species to be Used
Species to be used in restorative plantings are likely to include Sitka spruce (*Picea sitchensis*), wax myrtle (*Morella californica*), and coast silk tassel (*Garrya elliptica*).

Habitat Linkage
The Demello parcel is located adjacent to the Humboldt Bay National Wildlife Refuge's Lanphere and Ma-le'l Dunes Units (a USFWS refuge unit encompassing approximately 750 acres). Further, the USFWS is in support of taking on the Demello parcel's long-term management. Once restoration goals have been achieved, Caltrans would deed the parcel over to the USFWS to be added to the Humboldt Bay National Wildlife Refuge's Lanphere and Ma-le'l Dunes Units. Adding the Demello parcel to the Refuge Unit would result in over 800 publically-held, contiguous acres being managed for the benefit of native habitats and species.

Permanently placing the parcel into the public domain will serve as a positive contribution to current habitat preservation and connectivity goals in north Humboldt Bay and will likely provide for increased recreational opportunities. Retaining the Demello parcel within the public domain will offer long-term protection in perpetuity, achieving resource conservation and stewardship while protecting water quality and wildlife resource values from the potential and unknown pressures of private management and/or zoning changes. (See Exhibit 3a, Parcel Adjacency to Other Public Resource Lands).

OLD SAMOA PARCEL

The Old Samoa parcel is located just west of the City of Arcata, between State Route 255 and Old Samoa Road, within the coastal zone (see Exhibit 2, Parcel(s) Location Map, page 17. The parcel was selected in part, because of its location adjacent to the California Department of Fish and Game (CDFG) Mad River Slough Wildlife Area, as well as the City of Arcata's Marsh and Wildlife Sanctuary. See Exhibit 3b, Parcel Adjacency to Other Public Resource Lands, page 19.

The 38.3-acre Old Samoa parcel is zoned Agricultural Exclusive within a combining zone for flood hazard and transitional agricultural lands; the agricultural soil is non-prime. Proposed mitigation is compatible with adjacent land use and will enhance the ecologic value of adjacent natural resource properties.

Description of Site Conditions
The Old Samoa parcel is a former tideland located behind a levee. The parcel has long been in agricultural use for hay production and cattle grazing. The parcel exhibits a single canopy layer of herbaceous vegetation and includes artificial drainage swales that serve to prematurely hasten water off the property.

As with Demello South, pasture vegetation is dominated by commercial forage species such as tall fescue, ryegrass and clover. Further, this agricultural wetland also presents a mosaic wetland/non-wetland vegetation pattern. Extensive vegetation surveys utilizing the current

ACOE published guidance for delineating wetlands under a "managed plant communities" scenario determined that approximately 40% of the pasture is dominated by non-native, non-hydrophytic vegetation. However, the ACOE has asserted jurisdiction over the entire 38.3-acre parcel[10]. On January 13, 2010 while asserting that the entire parcel was wetland based on hydric soils and wetland hydrology, Dan Martel (ACOE staff) did agree that the Old Samoa parcel clearly offers wetland restoration opportunities.

Because of the parcel's compromised wetland status, wetland function and service are low. In winter the parcel exhibits a stubbly vegetation cover and is inhabited by cattle and red flies. Early spring can bring hundreds of Aleutian geese to browse the clover-rich pasture, however, grazing cattle chase out the geese. Over the spring/early-summer as the hay stand matures, the pasture is made use of by songbirds, voles and numerous insect species, while amphibians can be seen metamorphosing within watering troughs. However, in August, after harvesting hay, the pasture is reduced once again to a stubbly field. See Exhibit 4B, Old Samoa Parcel Existing Conditions, page 21.

Because of the parcels' manipulated hydrology and vegetation management activities, it is believed that wetland restoration activities can be successful here. Current hydrologic sources are fresh water (a high water table and rainfall); there is no existing connectivity for saltwater influence. The site is not pumped to control water levels. (Significantly greater detail the parcel's extant wetland vegetation, hydrology, soils and topography can be found in the Old Samoa and Demello South Parcels Wetland Delineation Report, verified by the ACOE on March 23, 2010). See Figure 2, site photos of Old Samoa parcel, page 23.

#4) PROPOSED MANAGEMENT ACTION – Restore Wetland, 36.3 acres.

General Hydraulic Considerations: Restoration activities would include modifications to the parcel's artificially drained topography with the goal of restoring historic drainage patterns. This would entail grading or excavation to allow more water to remain on site over a longer period of time. Likely the parcel would be re-contoured to mimic the historic drainage pattern of slough channeling. Also, drainage swales (running north/south) that currently serve to move water off the site would be back-filled with soil.

Allowing water to pond within a feature that is deeper than the current drainage swales will have no negative hydrologic impact to Old Samoa Road, State Route 101 or adjacent properties[11]. Retaining hydrology on site over a longer season through grading/fill, thus creating wetter habitat, is likely to reduce, the presence of introduced forage species; thereby restoring a predominance of hydrophytic native plants across the parcel.

[10] The entire parcel would qualify as coastal (one-parameter) wetland definition.

[11] A ditch that runs along Old Samoa Road has been ineffective at draining the parcel, and neighboring parcels, for the past many years [per the previous landowner]. As the ditch fills to capacity with winter rainfall, the drainage swales on the Samoa Parcel are backfilled with water.

It is proposed to establish riparian wetland plantings on approximately 1/3 of the property, along the parcel's northern and western boundaries. The establishment of riparian wetland at this location will serve to provide complimentary habitat to surrounding natural resource properties as well as diversify and enhance wetland functions at the site.

Creating riparian wetland, providing vertical structure, will afford the following new conditions at the site: tree canopy and understory habitat – providing food and cover for birds and mammals (e.g. neo-tropical bird nesting habitat; perch sites for raptors, night roosting habitat for shorebirds, and tall grass habitat for small mammals). The proposed riparian plantings will also serve to create a visual barrier between the highway (SR 255) and the CDFG Mad River Slough Wildlife Area. Further, this proposed planting would connect to established (and planned) riparian habitat within the CDFG's Mad River Slough Wildlife Area.

Cessation of haying will further reduce non-native forage species and also improve water-holding functions at the site by allowing for a thicker thatch to accumulate and increasing the organic input back to the soil.

Also, a grassy ditch/swale would be constructed to run along the parcel's north boundary, adjacent to State Route 255, to serve as a pre-treatment for roadside runoff; thereby intercepting, holding and treating this runoff prior to the water entering the site.

The CDFG has expressed interest in seeing the Old Samoa parcel managed to support Aleutian cackling goose foraging habitat. This management strategy would involve maintaining short-grass habitat through the use of seasonal cattle grazing[12].

Two acres of compensatory coastal wetland mitigation were initiated at this site in March 2010. In partial fulfillment of Coastal Development Permit #1-07-013, Caltrans implemented riparian wetland plantings along the parcel's northern boundary. See conceptual rendering: Attachment 3, #4 Proposed Management Action, Restore Wetland.

<u>Species to be Used</u>
Species to be utilized in the riparian wetland area would include willow (*Salix hookeriana* and *S. sitchensis*), alder (*Alnus rubra*), Pacific wax myrtle (*Myrica californica*), Nootka rose (*Rosa nutkana* var. *nutkana*), twinberry (*Lonicera involucrata*) and other native shrubs. Within restored areas of non-riparian wetland habitat, water foxtail (*Alopecurus geniculatus*) and panicled bulrush (*Scirpus microcarpus*) will likely be utilized.

<u>Habitat Linkage</u>
The Samoa parcel is adjacent to the CDFG Mad River Slough Wildlife Area (protected resource lands encompassing over 550 acres), as well as the City of Arcata's Marsh and Wildlife Sanctuary (a sanctuary encompassing over 300 acres). Further, the CDFG is in

[12] As with the Demello parcel, for areas retained in short-grass pasture, grazing management prescriptions could be developed to benefit water quality.

support of taking on long-term management of the Old Samoa parcel. Once restoration goals had been achieved, the parcel would then be deeded over to the CDFG to be added to the Mad River Slough Wildlife Area. Adding the Old Samoa parcel to the Wildlife Area would result in nearly 900 acres of publically-held, contiguous habitat being managed for the maximum benefit of wetland resources.

Restoration activities at the Old Samoa parcel will provide for a natural continuum of 38.3-acres of freshwater fringe wetland and riparian habitat that will both complement and enhance the directly adjacent McDaniel Slough Wetland Enhancement Project (joint-constructed by the CDFG and the City of Arcata), a project restoring tidal wetland functions to approximately 200 acres.

Retaining the parcel in the public domain will serve as a positive contribution to current habitat preservation and connectivity goals in north Humboldt Bay and may also provide for increased recreational opportunities. Retaining the Old Samoa parcel within the public domain will offer long-term protection in perpetuity, achieving resource conservation and stewardship while protecting water quality and wildlife resource values from the potential and unknown pressures of private management and/or zoning changes. (See Exhibit 3b. Parcel Adjacency to Public Resource Lands)

Function/Service Enhanced or Created

Utilizing the eight functions/services described by 33 CFR Section 320.4(b) that are considered to be important to the public interest (Table 1 of this report), proposed management actions will demonstrably create the following three wetland functions/services: i) restored wetlands will serve significant biological functions, providing habitat for rare and protected species; ii) successfully restored wetlands will be set aside within pre-established public wildlife refuges, and vii) restored wetlands will be unique in nature and scarce in quantity to both the region and local area. All three of these functions/services are absent in within 8.1 acres of the 8.2 acre project impact area.

Cost Estimate

Cost estimates to implement wetland restoration at Demello vary greatly depending on the restoration approach utilized, from approximately $800,000 for a freshwater approach to $3,000,000 for a full tidal approach [13]. A muted tidal approach cost estimate would fall somewhere in between the previous two estimates. Cost estimates for Old Samoa are approximately $600,000.

Performance Monitoring Criteria

As part of our final mitigation plan, quantitative performance monitoring criteria will be developed after baseline data from appropriate reference sites has been established. For each of the targeted restoration habitat types, an appropriate reference site will be utilized and

[13] While it may seem most cost-effective to implement a freshwater approach, if design studies indicate that tidal or muted tidal restoration is practicable at the site, regulatory and resource agency may require that we implement this costlier approach.

performance monitoring criteria will be developed with reference to baseline data. Table 3, next page, illustrates the Performance Monitoring that will occur in Years 1-4.

Mitigation Success Criteria

As part of our final mitigation plan, quantitative mitigation success criteria will be developed after baseline data from appropriate reference sites (by habitat type) has been established. As the table below illustrates, Success Criteria will be evaluated in Year 5.

Table 3 – Proposed Monitoring Criteria

Year after Planting	Absolute Cover	Relative Cover	Species Richness
Year 1	At least 20% of mean baseline cover of reference sites	At least 60% of relative cover to be provided by target species (provided that plants are mature enough to identify accurately)	No established populations of invasive non-native plant species present
Year 2	At least 30% of mean baseline cover of reference sites	At least 60% of relative cover to be provided by target species	At least 50% of the average number of native species present in reference wetlands
Year 3	At least 50% of mean baseline cover of reference sites	At least 60% of relative cover to be provided by target species	At least 60% of the average number of native species present in reference wetlands
Year 4	At least 60% of mean baseline cover of reference sites	At least 60% of relative cover to be provided by target species	At least 70% of the average number of native species present in reference wetlands
Year 5 Final Success Criteria	At least 70% of mean baseline cover of reference sites	At least 60% of relative cover to be provided by target species	At least 80% of the average number of native species present in reference wetlands

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Popham, Gail. Eureka to Arcata Coridor Improvement Project, project biologist, pers. comm 4/5/11.

Exhibit 1
Vicinity Map

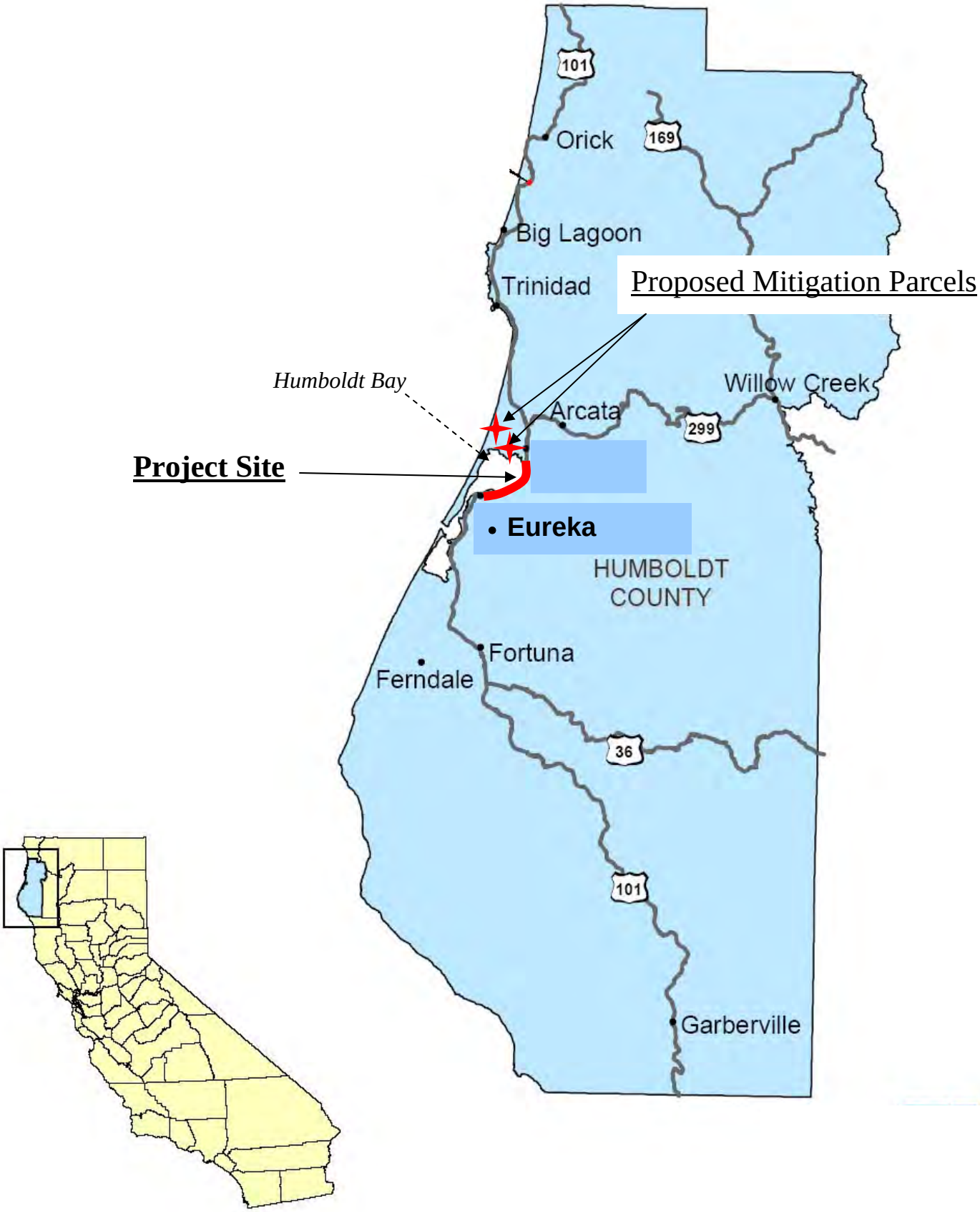
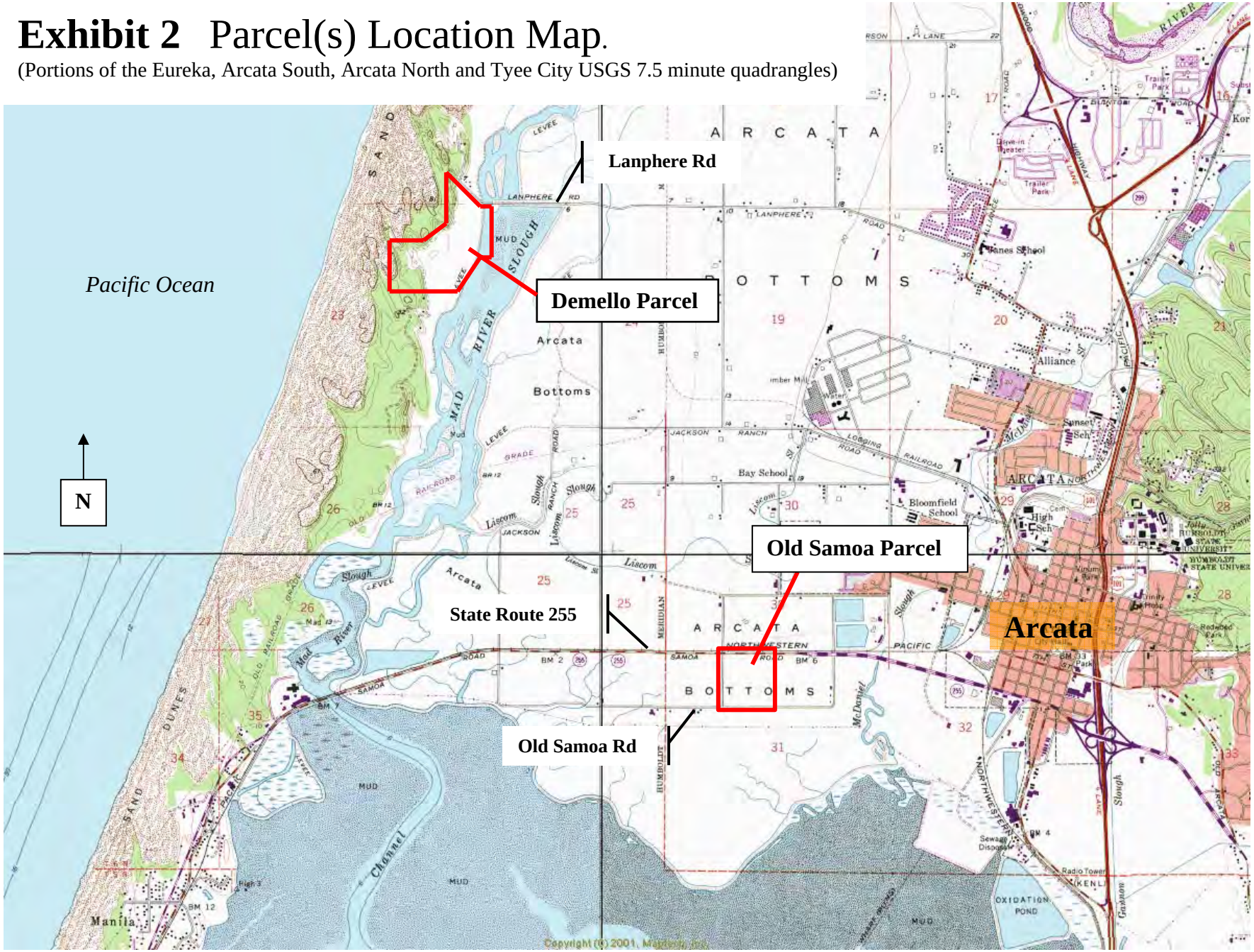


Exhibit 2 Parcel(s) Location Map.

(Portions of the Eureka, Arcata South, Arcata North and Tyee City USGS 7.5 minute quadrangles)



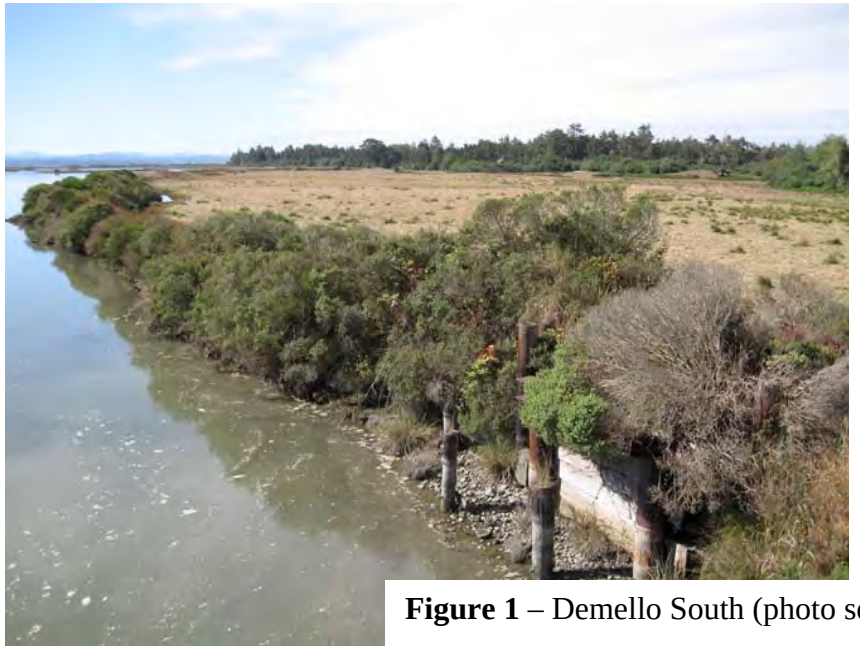


Figure 1 – Demello South (photo series taken from N/E corner, 9/16/09).

Figure 2 – Old Samoa Parcel (photo series taken from N/W corner, 9/16/09).

Appendix K Notice of Preparation, Notice of Intents, Public Notices, and Written Comments Conceptual Wetland Mitigation Plan

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20590. Office hours are from 7:30 a.m. to 4:30 p.m., Monday through Friday, except Federal holidays.

Electronic Access: Internet users may access all comments received by the U.S. DOT Dockets, Room PL–401, by using the universal resource locator (URL): *http://dms.dot.gov*. It is available 24 hours each day, 365 days each year. Please follow the instructions online for more information and help. An electronic copy of this document may be downloaded using a modem and suitable communications software from the Government Printing Office Electronic Bulletin Board Service at telephone number 202–512–1661. Internet users may reach the Federal Register's home page at *http://www.nara.gov/fedreg* and the Government Printing Office's database at *http://www.access.gpo.gov/nara*.

Authority: The Paperwork Reduction Act of 1995; 44 U.S.C. Chapter 35, as amended; and 49 CFR 1.48.

Issued on: August 28, 2001.

James R. Kabel,

Chief, Management Programs and Analysis Division.

[FR Doc. 01–22040 Filed 8–30–01; 8:45 am]

BILLING CODE 4910–22–P

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Environmental Impact Statement: Greene, Christian and Lawrence Counties, Missouri

AGENCY: Federal Highway Administration (FHWA)

ACTION: Notice of intent.

SUMMARY: The FHWA is issuing this notice to advise the public that an environmental impact statement (EIS) will be prepared for improvements to the U.S. 60 highway corridor in Greene, Christian, and Lawrence Counties, Missouri.

FOR FURTHER INFORMATION CONTACT: Ms. Peggy Casey, Environmental Projects Engineer, FHWA Division Office, 209 Adams Street, Jefferson City, MO 65101; Telephone: (573) 638–2601 or Mr. Henry Hungerbeeler, Director, Missouri Department of Transportation, P.O. Box 270, Jefferson City, Missouri, 65102; Telephone (573) 721–2551.

SUPPLEMENTARY INFORMATION: The FHWA, in cooperation with the Missouri Department of Transportation (MoDOT), will prepare an EIS on a proposed project to improve the transportation system in Greene, Christian and Lawrence Counties, Missouri.

This proposal is being considered to address existing and future transportation demand on U.S. 60, to address safety issues along existing U.S. 60, and to preserve land for future transportation improvements. Alternatives under consideration include: (1) no build; (2) improving the existing facility; (3) mass transit; (4) Transportation System Management; and (5) off-alignment build alternatives. The proposed project will likely include transportation improvements or transportation corridor preservation on an approximate 20-mile portion of U.S. 60 between the James River Freeway in Greene County, Missouri and a point along U.S. 60 just southwest of Marionville in Lawrence County, Missouri.

A project advisory committee comprised of federal and state agencies, local officials, and those with environmental and other community interests will be established to provide input during development and refinement of alternatives and corridor reservation activities. A series of public meetings and other public involvement activities will be held to engage the regional community in the decision making process. In addition, a public hearing will be held to present the findings of the draft EIS. The draft EIS will be available for public and agency review and comment prior to the public hearing. Agencies having an interest in or jurisdiction regarding the proposed action will be contacted through interagency coordination meetings and mailings. Those who have previously expressed, or are known to have interest in the proposal will receive ample opportunity to comment and provide input.

To ensure that the full range of issues related to this proposed action are addressed and all substantive issues are identified, comments and suggestions are invited from all interested parties. Comments or questions concerning this proposed action and the EIS should be directed to the FHWA or MoDOT at the addresses provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on federal programs and activities apply to this program)

Issued on: August 22, 2001.

Peggy J. Casey.

Environmental Projects Engineer, Jefferson City.

[FR Doc. 01–22029 Filed 8–30–01; 8:45 am]

BILLING CODE 4910–22–M

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Environmental Impact Statement; Humboldt County, California

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of intent.

SUMMARY: The FHWA is issuing this notice to advise the public that an Environmental Impact Statement will be prepared for a proposed Route 101 project in Humboldt County in the Cities of Eureka and Arcata, and vicinity.

FOR FURTHER INFORMATION CONTACT: R.C. Slovensky, Acting Program Delivery Team Leader, North, Federal Highway Administration, 980 Ninth Street, Suite 400, Sacramento, CA 95814–2724, telephone (916) 498–5774. Kim Floyd, California Department of Transportation Project Manager, P.O. Box 3700, Eureka, CA 95502–3700, telephone (707) 441–5739.

SUPPLEMENTARY INFORMATION: Route 101 is part of the National Highway System and is a principal arterial route. The route is often referred to as the "lifeline of the North Coast" since it is the north coast's most important interregional route, serving as the connector to the Santa Rosa/San Francisco metropolitan areas to the south and the State of Oregon to the north. It is heavily used for the transportation of intercity/interstate commerce as well as being the principal route to many north coast recreational areas including State and National parks, rivers, ocean fishing, and beach areas. North of San Francisco, it is the second most heavily traveled non-freeway segment on Route 101 within California.

The proposed project limits extend from the intersection of State Route 255 in City of Eureka to the State Route 255 interchange in the City of Arcata along the Route 101 corridor from KP 127.5 to KP 138.1 (PM 79.2 to PM 85.8) in Humboldt County. The existing Route 101 corridor within these limits consists of two one-way arterials, a four-lane expressway, and a four-lane freeway.

The proposed Eureka-Arcata Corridor Improvement Project consists of the following:

1. Construct an interchange at Route 101 and Indianola Road;

2. Within existing expressway segments, all median crossings would be closed;

3. All existing at-grade access would be restricted to right-turn on/off movements only;

4. Acceleration and deceleration lanes would be lengthened at all access locations if needed;

5. The median width could be reduced.

In addition to the proposed project and No-Build Alternative, alternatives, including upgrade to freeway, that will meet the project purpose and need will be evaluated during the EIS process. Alternatives with substantially higher cost or with extensive environmental impacts will be considered infeasible and not be considered for further study.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State, and local agencies, and to private organizations and citizens who have previously expressed or are known to have an interest in this proposal. A scoping meeting is scheduled from 5 to 8 pm on September 20, 2001 at the Eureka Public Marina Wharfinger Building #1 Marina Way, in Eureka, CA.

Public notice will be given of the time and place of the scoping meeting. To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestion are invited from all interested parties. The views of agencies which may have knowledge about historic resources potentially affected by the proposal or interest in the effects of the proposal on historic properties are specifically solicited. Comments or question concerning this proposed action and the EIS should be directed to the FHWA at the address provided above by October 30, 2001.

Catalog of Federal Domestic Assistance Program Number 20.205, Highway Research, Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation Federal programs and activities apply to this program.

Issued on: August 13, 2001.

R. Clayton Slovensky,

Acting Program Delivery Team Leader, North Sacramento, California.

[FR Doc. 01–22028 Filed 8–30–01; 8:45 am]

BILLING CODE 4910–22–M

DEPARTMENT OF TRANSPORTATION

Maritime Administration

[Docket Number: MARAD–2001–10507]

Requested Administrative Waiver of the Coastwise Trade Laws

AGENCY: Maritime Administration, Department of Transportation.

ACTION: Invitation for public comments on a requested administrative waiver of the Coastwise Trade Laws for the vessel RAVEN.

SUMMARY: As authorized by Pub. L. 105–383, the Secretary of Transportation, as represented by the Maritime Administration (MARAD), is authorized to grant waivers of the U.S.-build requirement of the coastwise laws under certain circumstances. A request for such a waiver has been received by MARAD. The vessel, and a description of the proposed service, is listed below. Interested parties may comment on the effect this action may have on U.S. vessel builders or businesses in the U.S. that use U.S.-flag vessels. If MARAD determines that in accordance with Pub. L. 105–383 and MARAD's regulations at 46 CFR part 388 (65 FR 6905; February 11, 2000) that the issuance of the waiver will have an unduly adverse effect on a U.S.-vessel builder or a business that uses U.S.-flag vessels, a waiver will not be granted.

DATES: Submit comments on or before October 1, 2001.

ADDRESSES: Comments should refer to docket number MARAD–2001–10507. Written comments may be submitted by hand or by mail to the Docket Clerk, U.S. DOT Dockets, Room PL–401, Department of Transportation, 400 7th St., SW., Washington, DC 20590–0001. You may also send comments electronically via the Internet at *http://dmses.dot.gov/submit/*. All comments will become part of this docket and will be available for inspection and copying at the above address between 10 a.m. and 5 p.m., E.T., Monday through Friday, except federal holidays. An electronic version of this document and all documents entered into this docket is available on the World Wide Web at *http://dms.dot.gov.*

FOR FURTHER INFORMATION CONTACT: Kathleen Dunn, U.S. Department of Transportation, Maritime Administration, MAR–832 Room 7201, 400 Seventh Street, SW., Washington, DC 20590. Telephone 202–366–2307.

SUPPLEMENTARY INFORMATION: Title V of Pub. L. 105–383 provides authority to the Secretary of Transportation to administratively waive the U.S.-build requirements of the Jones Act, and other statutes, for small commercial passenger vessels (no more than 12 passengers). This authority has been delegated to the Maritime Administration per 49 CFR 1.66, Delegations to the Maritime Administrator, as amended. By this notice, MARAD is publishing information on a vessel for which a request for a U.S.-build waiver has been received, and for which MARAD requests comments from interested parties. Comments should refer to the docket number of this notice and the vessel name in order for MARAD to properly consider the comments. Comments should also state the commenter's interest in the waiver application, and address the waiver criteria given in § 388.4 of MARAD'S regulations at 46 CFR part 388.

Vessel Proposed for Waiver of the U.S.-build Requirement

(1) Name of vessel and owner for which waiver is requested. Name of vessel: RAVEN. Owner: Alexander Mann.

(2) Size, capacity and tonnage of vessel. According to the applicant: "37.8′ LOA; 20.7′ Beam; 3.1′ Draft; 20 Gross Tons (Certificate of Documentation U.S.C.G.); 16 Net Tons (Certificate of Documentation U.S.C.G.)"

(3) Intended use for vessel, including geographic region of intended operation and trade. According to the applicant: "The intended use for this sailing vessel is to provide 3 hour to five-day sightseeing charters* * * for twelve or fewer passengers." "Operating from the Florida coast, including the Florida Keys, and Gulf of Mexico coastline."

(4) Date and Place of construction and (if applicable) rebuilding. Date of construction: 1996. Place of construction: France.

(5) A statement on the impact this waiver will have on other commercial passenger vessel operators. According to the applicant: "We would like to begin operating in Marco Island Florida. The population triples in the winter and demand appears to be excellent (one of the corporations operating an inspected vessel added an additional craft). Approval of this waiver will have minimal impact on other operators because of the very large market available. This vessel would be the only owner-operated sailboat in the area. We are dedicated to providing customers with an intimate and fun adventure in the beautiful waters and atmosphere, which surrounds the Ten Thousand, Islands. Our 38-foot cruising catamaran is equipped to provide great hospitality and the capacity to tailor every trip to the needs of our passengers. We are able to offer Eco-trips in the backwaters and are determined to provide the most personal sailing experience on the Gulf of Mexico."

(6) A statement on the impact this waiver will have on U.S. shipyards. According to the applicant: "This vessel will have only a positive impact on U.S. shipyards. The vessel will be upgraded and maintained by U.S. yards."

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse

Gray Davis
GOVERNOR

Steve Nissen
DIRECTOR

Notice of Preparation

September 7, 2001

To: Reviewing Agencies

Re: Eureka-Arcata Corridor Improvements
SCH# 2001092035

Attached for your review and comment is the Notice of Preparation (NOP) for the Eureka-Arcata Corridor Improvements draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Deborah Harmon
Department of Transportation, District 1
P.O. Box 3700
Eureka, CA.95502

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan for K.F.

Karen Fowler
Project Analyst, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2001092035
Project Title Eureka-Arcata Corridor Improvements
Lead Agency Caltrans #1

Type NOP Notice of Preparation

Description
1. Construct an interchange at Route 101 and Indianola Road;
2. Within existing expressway segments, all median crossings would be closed;
3. All existing at-grade access would be restricted to right-turn on/off movements only;
4. Acceleration and deceleration lanes would be lengthened at all access locations if needed;
5. The median width could be reduced.

Lead Agency Contact

Name Deborah Harmon
Agency Department of Transportation, District 1
Phone 707 445-6416 *Fax*
email
Address P.O. Box 3700
City Eureka *State* CA *Zip* 95502

Project Location

County Humboldt
City Eureka, Arcata
Region
Cross Streets
Parcel No.
Township *Range* *Section* *Base*

Proximity to:

Highways 101, SR 255
Airports
Railways
Waterways
Schools
Land Use

Project Issues Public Services; Wildlife; Geologic/Seismic; Water Quality; Flood Plain/Flooding; Traffic/Circulation; Noise; Archaeologic-Historic; Toxic/Hazardous

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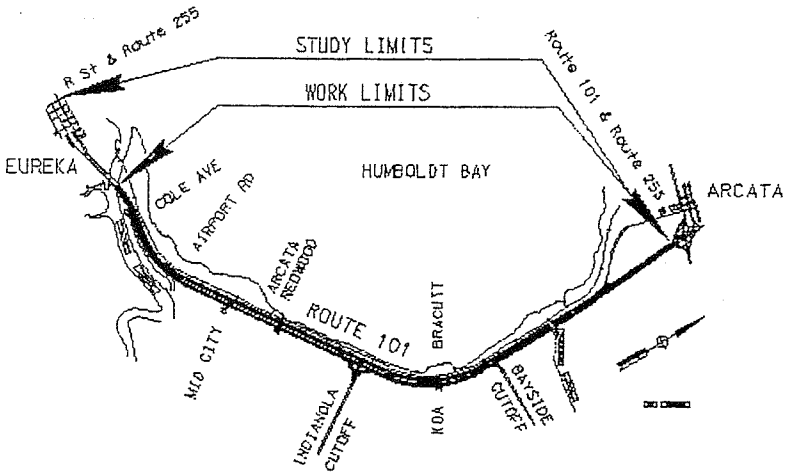
Reviewing Agencies Resources Agency; California Coastal Commission; Department of Conservation; Office of Historic Preservation; Department of Parks and Recreation; Department of Fish and Game, Region 1; Native American Heritage Commission; State Lands Commission; California Highway Patrol; Air Resources Board, Transportation Projects; Regional Water Quality Control Board, Region 1

Date Received 09/07/2001 *Start of Review* 09/07/2001 *End of Review* 10/08/2001

PUBLIC NOTICE

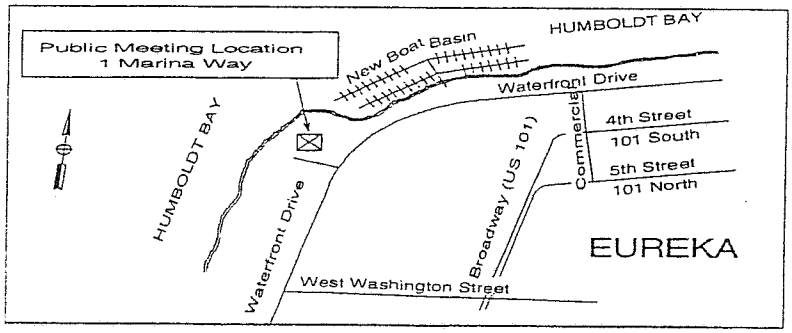
Announcement of Public Scoping Meeting and Availability of Project Information for Proposed Route 101 Eureka-Arcata Corridor Improvement Project



WHAT'S BEING PLANNED: The California Department of Transportation (Caltrans), the Humboldt County Association of Governments, and the Federal Highway Administration (FHWA), are formally initiating the project development and environmental documentation process for safety and operational improvements on Route 101 between Eureka and Arcata. Several alternatives are currently under study. It is anticipated that this project may have substantial and unavoidable impacts. Therefore, Caltrans is proceeding with the preparation of an Environmental Impact Report/Statement (EIR/S) as the appropriate environmental document in compliance with State and Federal environmental regulations. During the joint project development and environmental process, a least environmentally harmful preferred alternative that meets the purpose and need for the project will be developed and selected.

WHERE YOU COME IN: The public is invited to attend an open house scoping meeting and review project alternative displays. Caltrans staff will be available to answer questions and receive comments or suggestions for consideration during the project development and environmental documentation process. This project is in the early planning and project development phase. There will be additional opportunities to attend future public meetings regarding this project. Comments will be received at the meeting, or if you are unable to attend, **written comments may be submitted prior to October 5, 2001** to CALTRANS, Attn: Kimberly Floyd, Project Manager, P. O. Box 3700, Eureka, CA 95502-3700.

WHEN AND WHERE: The public open house will be held from 5 to 8 pm on Thursday, September 20, 2001 at the Eureka Public Marina, 1 Marina Way, Eureka, California (see map below for meeting location). Project Information will also be available for review at the Caltrans District Office at 1656 Union Street, Eureka by appointment only. Please contact Kimberly Floyd, the Project Manager, for an appointment at the number listed below.



CONTACT: For more information about this study or any transportation matter, contact Kimberly Floyd, Project Manager, at CALTRANS – (707) 441-5739, or Deborah Harmon, Environmental Branch Chief, at CALTRANS – (707) 445-6416. For individuals with sensory disabilities, this notice is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to the Caltrans District 1 Environmental Management Branch, P. O. Box 3700, Eureka, CA 95502-3700. (707) 445-6416; TTY users may contact the California Relay Service TTY line at 1-800-735-2929 or Voice Line at 1-800-735-2922.

TIMES STANDARD DATE 5-4-03

State of California Department of Transportation CALTRANS

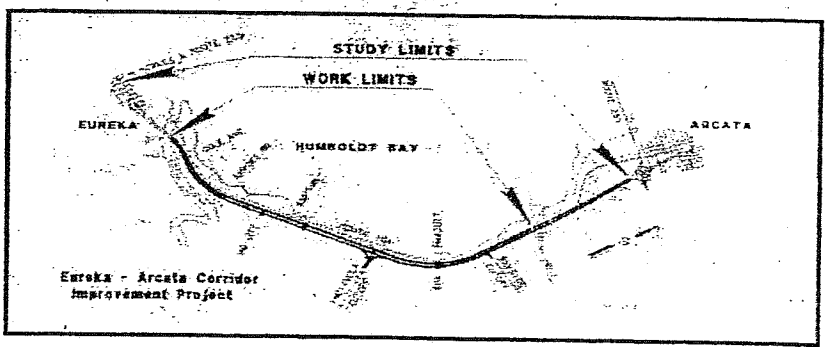
PUBLIC NOTICE

Caltrans Improves Mobility Across California

ANNOUNCEMENT OF PUBLIC INFORMATION MEETING FOR THE PROPOSED ROUTE 101 EUREKA-ARCATA CORRIDOR IMPROVEMENT PROJECT

WHAT IS BEING PLANNED

The California Department of Transportation (Caltrans), the Humboldt County Association of Governments, and the Federal Highway Administration (FWHA), are in the project development phase to complete safety and operational improvements on Route 101 between Eureka and Arcata. Four "build" alternatives are currently under study, three include an interchange at Indianola Cutoff. Caltrans is proceeding with the preparation of an Environmental Impact Report/Statement (EIR/S) as the appropriate environmental document in compliance with State and Federal environmental regulations.



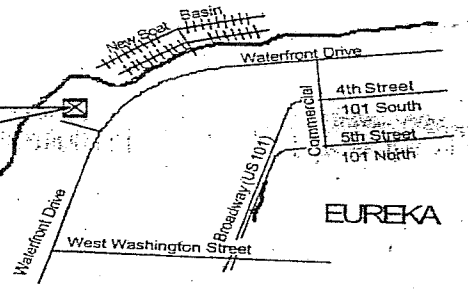
WHY THIS NOTICE & WHERE YOU COME IN

The public is invited to attend an open house meeting and review current project alternative displays, visual simulations of proposed interchanges, traffic impact study results, socio-economic study results, and other project related information. There will be no formal presentation. Staff will be available to answer questions. Comment cards will be available at the meeting, or if you are unable to attend, please send your written comments to: CALTRANS, Kim Floyd, Project Manager, P.O. Box 3700, Eureka, CA 95502-3700, ***written comments must be postmarked no later than May 29, 2003.*** There will be a future public meeting regarding the formal environmental document, scheduled for January 2004.

PUBLIC MEETING/HEARING

The open house will be:

THURSDAY, MAY 15, 2003
5 TO 7 p.m.
Eureka Public Marina
1 Marina Way
Eureka



CONTACT INFORMATION

For more information about this project, contact:

CALTRANS PROJECT MANAGER
Kim Floyd
(707) 441-5739

or

CALTRANS ENVIRONMENTAL BRANCH CHIEF
Deborah Harmon
(707) 445-6416

For individuals with sensory disabilities, this notice is available in Braille, large print, on audio cassette, or computer disk. To obtain a copy in one of these alternate formats, please write to the Caltrans District 1 Environmental Management Branch, P.O. Box 3700, Eureka, CA 95502-3700, or call (707) 445-6416; TTY users may contact the California Relay Service TTY line at 1-800-735-2929 or Voice Line at 1-800-735-2922.

aspects of the climate system and climate change; Working Group II assesses the vulnerability of socio-economic and natural systems to climate change, potential negative and positive consequences, and options for adapting to it; and Working Group III assesses options for limiting greenhouse gas emissions and otherwise mitigating climate change. These assessments are based upon the peer-reviewed literature and are characterized by an extensive and open review process involving both scientific/technical experts and governments before being accepted by the IPCC.

The IPCC Secretariat has informed the U.S. Department of State that the second-order draft of the Working Group II contribution to the Fourth Assessment Report is available for Expert and Government Review. The Climate Change Science Program Office (CCSPO) is coordinating collection of U.S. expert comments and the review of these collations by panels of Federal scientists and program managers to develop a consolidated U.S. Government submission. Instructions on how to format comments are available at *http://www.climatescience.gov/Library/ipcc/wg24ar-review.htm*, as is the document itself and other supporting materials. Comments must be sent to CCSPO by June 28, 2006 to be considered for inclusion in the U.S. Government collation. Comments submitted for potential inclusion or consideration as part of the U.S. Government Review should be reserved for that purpose, and not also sent to the IPCC Working Group II Technical Support Unit as a discrete set of expert comments.

Properly formatted comments should be sent to CCSPO at *wg24AR-USGreview@climatescience.gov* by COB Tuesday, June 28, 2006. Include report acronym and reviewer surname in e-mail subject title to facilitate processing.

For further information, please contact David Dokken, U.S. Climate Change Science Program, Suite 250, 1717 Pennsylvania Ave., NW., Washington, DC 20006 (*http://www.climatescience.gov*).

Dated: May 9, 2006.

Trigg Talley,

Office Director, Acting, Office of Global Change, Bureau of Oceans and International Environmental and Scientific Affairs, Department of State.

[FR Doc. E6–8164 Filed 5–25–06; 8:45 am]

BILLING CODE 4710–09–P

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Environmental Impact Statement; Humboldt County, CA

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of Intent.

SUMMARY: The FHWA is republishing this notice to advise the public that an Environmental Impact Statement (EIS) will be prepared for the proposed highway project along U.S. Highway (Highway) 101 in Humboldt County, in the Cities of Eureka and Arcata, and the unincorporated area between the two cities, California. The original Notice of Intent (NOI) was published in the **Federal Register** on August 31, 2001, (Volume 66, Number 170, Pages 46061 & 46062). The NOI is being republished due to project changes of adding roadway rehabilitation work and new alternatives to the proposed project.

FOR FURTHER INFORMATION CONTACT: Leland Dong, Team Leader—North Region, Federal Highway Administration, 650 Capitol Mall, Suite 4–100, Sacramento, CA 95814–4708, telephone (916) 498–5860 or Kim Floyd, California Department of Transportation Project Manager, P.O. Box 3700, Eureka, CA 95502–3700, telephone (707) 441–5739.

SUPPLEMENTARY INFORMATION: U.S. Highway 101 is part of the National Highway System and is a principal arterial route. The route is often referred to as the "lifeline of the North Coast" since it is the California north coast's most important interregional route, serving as the connector to the Santa Rosa/San Francisco metropolitan areas to the south and the State of Oregon to the north. It is heavily used for the transportation of intercity/intestate commerce as well as being the principal route to many north coast recreational areas including State and National parks, rivers, ocean fishing, and beach areas. North of San Francisco, it is the second most heavily traveled non-freeway segment on Highway 101 within California.

The proposed project limits extend from just north of the Eureka Slough Bridge in the City of Eureka to the 11th Street over crossing in the City of Arcata along the Highway 101 corridor from KP 128.6 to KP 138.9 (PM 79.9 to PM 86.3) in Humboldt County. The existing Highway 101 corridor within these limits consists of two one-way arterials, a four-lane expressway, and a four-lane freeway.

The proposed Eureka-Arcata Corridor Improvement Project consists of the following:

- Realign and signalize Airport Road/Highway 101,
- Realign the intersection of Jacobs Road with Airport Road,
- Construct a third northbound lane from Cole Avenue to Mid City Motors,
- Close median crossings and acceleration and deceleration lanes (remove existing pavement) at Mid City Motors, Green Diamond sawmill, Bracut, and Bayside Cutoff,
- Construct a compact diamond interchange at Indianola Cutoff,
- Extend existing right side acceleration and deceleration lanes,
- Reconstruct access ramps at existing Highway 101/Route 255 Interchange,
- Pave median and install concrete barrier from South G Street to 11th Street in Arcata,
- Replace southbound Jacoby Creek Bridge,
- Widen northbound Jacoby Creek and Gannon Slough bridges for standard shoulder widths and upgraded bridge rails,
- Provide minor shoulder widening,
- Place shoulder backing material,
- Overlay pavement with asphalt concrete (AC) with open graded AC surfacing,
- Install thrie-beam median barrier from Eureka Slough Bridge to Airport Road,
- Install upgraded lighting,
- Replace tide gates and,
- Remove all trees not currently protected by barrier, within nine meters (30-feet) of the Highway 101 edge of traveled way (white pavement stripes) within the project limits.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State, and local agencies, and to private organizations and citizens who have previously expressed or are known to have an interest in this proposal.

To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties. The views of agencies, which may have knowledge about historic resources potentially affected by the proposal or interest in the effects of the proposal on historic properties, are specifically solicited. Comments or questions concerning this proposed action and the EIS should be directed to the FHWA at the address previously provided in this notice:

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Research,

Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation Federal programs and activities apply to this program)

Issued on: May 18, 2006.

Leland W. Dong,

Project Development Engineer, California Division, Federal Highway Administration.

[FR Doc. 06–4876 Filed 6–25–05; 8:45am]

BILLING CODE 4910–22–M

DEPARTMENT OF TRANSPORTATION

Maritime Administration

[Docket Number 2006 24881]

Requested Administrative Waiver of the Coastwise Trade Laws

AGENCY: Maritime Administration, Department of Transportation.

ACTION: Invitation for public comments on a requested administrative waiver of the Coastwise Trade Laws for the vessel ALINA.

SUMMARY: As authorized by Pub. L. 105–383 and Pub. L. 107–295, the Secretary of Transportation, as represented by the Maritime Administration (MARAD), is authorized to grant waivers of the U.S.-build requirement of the coastwise laws under certain circumstances. A request for such a waiver has been received by MARAD. The vessel, and a brief description of the proposed service, is listed below. The complete application is given in DOT docket 2006–24881 at *http://dms.dot.gov*. Interested parties may comment on the effect this action may have on U.S. vessel builders or businesses in the U.S. that use U.S.-flag vessels. If MARAD determines, in accordance with Pub. L. 105–383 and MARAD's regulations at 46 CFR part 388 (68 FR 23084; April 30, 2003), that the issuance of the waiver will have an unduly adverse effect on a U.S.-vessel builder or a business that uses U.S.-flag vessels in that business, a waiver will not be granted. Comments should refer to the docket number of this notice and the vessel name in order for MARAD to properly consider the comments. Comments should also state the commenter's interest in the waiver application, and address the waiver criteria given in § 388.4 of MARAD's regulations at 46 CFR part 388.

DATES: Submit comments on or before June 26, 2006.

ADDRESSES: Comments should refer to docket number MARAD–2006 24881. Written comments may be submitted by hand or by mail to the Docket Clerk, U.S. DOT Dockets, Room PL–401, Department of Transportation, 400 7th St., SW., Washington, DC 20590–0001. You may also send comments electronically via the Internet at *http://dmses.dot.gov/submit/*. All comments will become part of this docket and will be available for inspection and copying at the above address between 10 a.m. and 5 p.m., E.T., Monday through Friday, except federal holidays. An electronic version of this document and all documents entered into this docket is available on the World Wide Web at *http://dms.dot.gov*.

FOR FURTHER INFORMATION CONTACT: Joann Spittle, U.S. Department of Transportation, Maritime Administration, MAR–830 Room 7201, 400 Seventh Street, SW., Washington, DC 20590. Telephone 202–366–5979.

SUPPLEMENTARY INFORMATION: As described by the applicant the intended service of the vessel ALINA is:

Intended Use: "Offer the vessel for evening charter to brides and grooms before or after a wedding event and entertain business clients of the owner and its affiliates."

Geographic Region: Massachusetts and Rhode Island.

Dated: May 22, 2006.

By order of the Maritime Administrator.

Joel C. Richard,

Secretary, Maritime Administration.

[FR Doc. E6–8199 Filed 5–25–06; 8:45 am]

BILLING CODE 4910–81–P

DEPARTMENT OF TRANSPORTATION

Maritime Administration

[Docket Number 2002 24879]

Requested Administrative Waiver of the Coastwise Trade Laws

AGENCY: Maritime Administration, Department of Transportation.

ACTION: Invitation for public comments on a requested administrative waiver of the Coastwise Trade Laws for the vessel DAUNTLESS.

SUMMARY: As authorized by Pub. L. 105–383 and Pub. L. 107–295, the Secretary of Transportation, as represented by the Maritime Administration (MARAD), is authorized to grant waivers of the U.S.-build requirement of the coastwise laws under certain circumstances. A request for such a waiver has been received by MARAD. The vessel, and a brief description of the proposed service, is listed below. The complete application is given in DOT docket 2006–24879 at *http://dms.dot.gov*. Interested parties may comment on the effect this action may have on U.S. vessel builders or businesses in the U.S. that use U.S.-flag vessels. If MARAD determines, in accordance with Pub. L. 105–383 and MARAD's regulations at 46 CFR part 388 (68 FR 23084; April 30, 2003), that the issuance of the waiver will have an unduly adverse effect on a U.S.-vessel builder or a business that uses U.S.-flag vessels in that business, a waiver will not be granted. Comments should refer to the docket number of this notice and the vessel name in order for MARAD to properly consider the comments. Comments should also state the commenter's interest in the waiver application, and address the waiver criteria given in § 388.4 of MARAD's regulations at 46 CFR part 388.

DATES: Submit comments on or before June 26, 2006.

ADDRESSES: Comments should refer to docket number MARAD–2006 24879. Written comments may be submitted by hand or by mail to the Docket Clerk, U.S. DOT Dockets, Room PL–401, Department of Transportation, 400 7th St., SW., Washington, DC 20590–0001. You may also send comments electronically via the Internet at *http://dmses.dot.gov/submit/*. All comments will become part of this docket and will be available for inspection and copying at the above address between 10 a.m. and 5 p.m., E.T., Monday through Friday, except Federal holidays. An electronic version of this document and all documents entered into this docket is available on the World Wide Web at *http://dms.dot.gov*.

FOR FURTHER INFORMATION CONTACT: Joann Spittle, U.S. Department of Transportation, Maritime Administration, MAR–830 Room 7201, 400 Seventh Street, SW., Washington, DC 20590. Telephone 202–366–5979.

SUPPLEMENTARY INFORMATION: As described by the applicant the intended service of the vessel DAUNTLESS is:

Intended Use: "Carry 2–4 passengers overnight or for the day and/or evening cruises, photo charter, special events, sunset cruise, harbor cruise; overnight and weekend romantic cruise. No fishing."

Geographic Region: State of Massachusetts.

Dated: May 22, 2006.

By order of the Maritime Administrator.

Joel C. Richard,

Secretary, Maritime Administration.

[FR Doc. E6–8190 Filed 5–25–06; 8:45 am]

BILLING CODE 4910–81–P

State of California • Department of Transportation

NEWS RELEASE

06-054

Today's Date: Monday, May 8, 2006
District: 1 - Eureka
Contact: Ann Marie Jones
Phone: (707) 445-6444

FOR IMMEDIATE RELEASE

ANNOUNCEMENT OF PROPOSED ROUTE 101 EUREKA-ARCATA CORRIDOR IMPROVEMENT PROJECT

Caltrans, in partnership with the Humboldt County Association of Governments and the Federal Highway Administration (FHWA), are formally re-initiating the project development and environmental documentation process for a long-term project to enhance the safety, operation, and serviceable life of Route 101 from the Eureka Slough Bridge to the 11th Street overcrossing in Arcata. Major project features being considered include: closing Route 101 median crossings; extending existing acceleration and deceleration lanes; replacing the Jacoby Creek southbound Bridge; and widening the northbound Jacoby Creek and Gannon Slough bridges. Possible features include construction of an interchange (undercrossing) at Route 101/Indianola Cutoff, and realignment and signalization of the Route 101/Airport Road intersection. It is anticipated this project may have substantial environmental impacts. Therefore, Caltrans is proceeding with the preparation of an Environmental Impact Report/Statement (EIR/S) in compliance with State and Federal environmental regulations. During the joint project development and environmental process, a least environmentally damaging practicable alternative that meets the purpose and need for the project will be selected.

NOTE: A previous notice for this project was published in September 2001. Subsequently, roadway rehabilitation work and new alternatives have been added, necessitating re-opening this project for public review and comment.

If you would like additional project information or would like to be added to the project mailing list, please refer to the contact information below. Project information will also be available for review at the Caltrans District Office at 1656 Union Street, Eureka by appointment only. Please contact Kimberly Floyd, Project Manager, for an appointment at the number listed below.

SLOW FOR THE CONE ZONE
C A L T R A N S

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Sean Walsh
Director

Notice of Preparation

May 26, 2006

To: Reviewing Agencies

Re: Eureka-Arcata Route 101 Corridor Improvement Project
SCH# 2001092035

Attached for your review and comment is the Notice of Preparation (NOP) for the Eureka-Arcata Route 101 Corridor Improvement Project draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Mitchell Higa
Department of Transportation, District 1
1656 Union Street
Eureka, CA 95501

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
for: Project Analyst, State Clearinghouse

Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH#	2001092035
Project Title	Eureka-Arcata Route 101 Corridor Improvement Project
Lead Agency	Caltrans #1

Type	NOP Notice of Preparation
Description	On Route 101 , from the north end of Eureka Slough Bridge to the 11th Street Overcrossing in Arcata, major proposed project features include closing Route 101 median crossings; constructing an interchange at Route 101/Indianola Cutoff; extending existing acceleration and deceleration lanes; replacing the Jacoby Creek southbound Bridge, and widening the northbound Jacoby Creek and Gannon Slough Bridges; and possible signalization and realignment of Route 101/Airport Road intersection.

Lead Agency Contact

Name	Mitchell Higa		
Agency	Department of Transportation, District 1		
Phone	707-441-5855	*Fax*	
email			
Address	1656 Union Street		
City	Eureka	*State* CA	*Zip* 95501

Project Location

County	Humboldt			
City	Eureka, Arcata			
Region				
Cross Streets	State Route 255			
Parcel No.				
Township	5N	*Range* 1E	*Section* ...	*Base*

Proximity to:

Highways	101, SR 255
Airports	Murray Field Airport
Railways	North Coast Railroad Authority
Waterways	Humboldt Bay, Eureka Slough, Jacoby Creek, Gannon Slough
Schools	
Land Use	Open Space, coastal, agricultural, industrial

Project Issues	Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Coastal Zone; Economics/Jobs; Flood Plain/Flooding; Geologic/Seismic; Noise; Public Services; Soil Erosion/Compaction/Grading; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Wetland/Riparian; Wildlife; Landuse; Cumulative Effects
Reviewing Agencies	Resources Agency; California Coastal Commission; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 1; Native American Heritage Commission; Caltrans, Division of Aeronautics; California Highway Patrol; Air Resources Board, Transportation Projects; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 1

Date Received 05/26/2006 *Start of Review* 05/26/2006 *End of Review* 06/26/2006

Wiyot Tribe

May 25, 2006

Rodney Parsons
CalTrans District 1
PO Box 3700
Eureka, CA 95502-3700

Re: Eureka-Arcata Corridor Improvement Project NOP

Dear Mr. Parsons,

The Wiyot Tribe has reviewed the information you provided regarding the Eureka-Arcata Corridor Improvement Project. The Wiyot Tribe requests Cultural Monitors be present at the work site during all grading and excavation associated with the various phases of this project. Grading and excavation of modern highway fill only will not be required.

Thank you for your time on this important matter.

Sincerely,

Andrea Davis
Environmental Director

(800) 388-7633 • FAX (707) 733-5601

Kim Floyd/D01/Caltrans/CAGov
06/16/2006 02:10 PM

To Mitch Higa/D01/Caltrans/CAGov@DOT
cc Todd Lark/D01/Caltrans/CAGov@DOT, Matt Brady/D01/Caltrans/CAGov@DOT, Mike Eagan/D01/Caltrans/CAGov@DOT
bcc
Subject RE: NOP comments due Eureka Arcata Corridor Project

"Mattson, Tom" <TMattson@co.humboldt.ca.us>
06/16/2006 02:04 PM

To: "Kim Floyd" <kim_floyd@dot.ca.gov>
cc:
Subject: RE: NOP comments due Eureka Arcata Corridor Project

Kim:

In general, I think most of my questions will probably be covered in the report. I would like to see if the projects can be separated if funding can occur from other sources for some of the safety and traffic flow issues rather than it being a all or none project. Please consider the items below:

1. Earlier construction phasing of the light at airport, not only to alleviate the traffic flow out of Jacobs and provide safer entrance to the highway, but also to allow for monitoring of the possible gap effect it could have at Indianola, enhancing the safety for users of that intersection.

2. Signal coordination for the traffic lights at the north end of town with a new light at airport to provide for both smooth traffic flow and the generation of northbound traffic gaps.

3. The use of the rail corridor for congestion relief portion of the project - ie is it economically feasible to use the rail for public transport between eur/arc, what is the cost for that related to the costs for the capacity enhancement portion of the project?

4. What protection does the rail structure offer for the highway from flooding, is it a critical component to protect the highway and should consideration be given to this structure in the report?

Thanks

Tom

U.S. Department of
Homeland Security

United States
Coast Guard

Commander
District Eleven

U.S. Coast Guard Island, Bldg 50-2
Alameda, CA 94501-5100
Staff Symbol: (dpw)
Phone: (510) 437-3514
Fax: (510) 437-5836

16590
Jacoby Creek (0.19)
Gannon Slough (0.13)
June 16, 2006

California Department of Transportation, District 1
P. O. Box 3700
Eureka, CA 95502-3700

Dear Mr. Parson:

We have completed our review of the Eureka – Arcata Route 101 Corridor Improvement Project correspondence of a proposed replacement of the southbound Hwy 101 bridge across Jacoby Creek, mile 0.19, the widening of northbound Hwy 101 bridges across Jacoby Creek, mile 0.19, and Gannon Slough, mile 0.13, between Arcata and Eureka, Humboldt County, California.

Provided there is no development of significant controversy concerning navigational or environmental issues, and there is no significant impact, no individual Coast Guard bridge permit will be required for this project (COMDTINST M16590.5C). This does not relieve the applicant, the California Department of Transportation, from complying with all applicable federal, state and local laws and associated permit requirements.

The General Bridge Act of 1946 requires the approval of the location and plans of bridges prior to start of construction (33 U.S.C. 525). The Commandant of the Coast Guard has given advance approval to the location and plans of bridges to be constructed across reaches of waterways considered navigable, but not actually navigated by other than logs, log rafts, rowboats, canoes and small motorboats. In such cases the clearances provided for high water stages will be considered adequate to meet the reasonable needs of navigation. (33 C.F.R. 115.70).

Identification of Advance Approval waterways is listed as a Categorical Exclusion in the Coast Guard, National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts (COMDTINST M16475.1D).

Gannon Slough and Jacoby Creek, at the proposed project sites, are considered navigable by Coast Guard standards. However, at the project site, the waterways are not navigated by anything larger than small motorboats and the Corps of Engineers has not indicated plans to make navigational improvements that would result in larger watercraft passing through the proposed bridge.

A photograph and as-built drawings of the bridges are required upon completion of the project. The drawings should indicate the elevation of the lowest hittable part of the bridges above mean high water.

16590
June 16, 2006

If the character of navigation changes such that the waterways no longer meets advance approval criteria, the Coast Guard will promptly withdraw the advance approval designation for these waterways and notify all interested parties.

Please notify our office upon beginning and completing the over-water portion of this project, so we may provide the appropriate Notice to Mariners. You may contact Mr. Carl Hausner, Project Manager, by telephone at (510) 437-3515, to discuss this project.

Sincerely,

DAVID H. SULOUFF
Chief, Bridge Section
By direction
Eleventh Coast Guard District

Copy: USACE, San Francisco District
USCG Sector San Francisco, Waterways Management

State of California

Memorandum

To: Mr. Rodney J. Parsons, Chief
Eureka Environmental Management Branch, E-1
Department of Transportation - District 1
Post Office Box 3700
Eureka, California 95502 - 3700

Date: June 23, 2006

From: DONALD B. KOCH, Regional Manager
Northern California - North Coast Region
Department of Fish and Game
601 Locust Street
Redding, California 96001

Subject: Eureka–Arcata Corridor Improvement Project – Notice of Preparation
SCH # 2001092035

The Department of Fish and Game (DFG) has reviewed the notice of preparation (NOP) for the above-referenced project. The project proposes a number of improvements to the Route 101 corridor from just north of the Eureka Slough Bridge in Eureka, to the 11th Street Overcrossing in Arcata. These improvements may include the following elements in addition to minor shoulder widening and paving: constructing a third northbound lane from Cole Avenue to Mid City Motors, closing existing median crossings and removing existing acceleration and deceleration lanes at 6 locations, construction of a compact diamond interchange at Indianola Cutoff, reconstructing access ramps at the existing Route 101/255 interchange, paving the median and installing a concrete barrier from South G Street to 11th Street in Arcata, replacing the southbound Jacoby Creek Bridge and widening the northbound Jacoby Creek and Gannon Slough bridges, installing thrie-beam median barrier from Eureka Slough Bridge to Airport Road, replacing tide gates, and removal of existing trees, not currently protected by barriers, within 30 feet of the traveled way. The DFG offers the following comments on the project pursuant to Section 15082(b) of the California Environmental Quality Act (CEQA) in our role as a responsible agency.

We agree with Caltrans' determination that an environmental impact report/statement (EIR/EIS) should be prepared for the project. The proposed work has the potential to impact important natural resources including coastal wetlands, the designated Fay Slough Wildlife Area, and special status plant and animal species. In addition, the project may adversely affect both resident and anadromous fisheries including southern Oregon - northern California Coast Coho Salmon (SONCC) (*Oncorhynchus kisutch*), a State and federally-listed threatened species.

Coastal wetlands, including tidal marsh, tidal sloughs and diked former tidelands, occur on both sides of the existing highway as well as within the median. The DFG recommends that a wetland delineation be conducted to identify, map, and characterize all wetland habitats within the project impact area. The DEIR/DEIS should evaluate

alternatives that avoid or minimize temporary and permanent impacts to wetlands. Where wetland impacts cannot be avoided, mitigation measures should be developed in consultation with the US Army Corps of Engineers, US Fish and Wildlife Service, and the DFG to ensure that project improvements will not result in a net loss of wetland acreage or habitat values. Mitigation for permanent wetland impacts should give priority to the restoration of former wetland areas in close proximity to the project site.

The DFG's Fay Slough Wildlife Area abuts the highway right-of-way on the south side of Route 101 between Mid City Motors and the site of the old drive-in theater west of Indianola Cutoff (see attached map). The wildlife area was acquired to protect important coastal wetland and diked former tideland habitats for migratory waterfowl and other wildlife species while providing recreational opportunities for the public. It is unclear from the NOP whether the proposed improvements will require additional right-of-way in this area. The DFG recommends that the DEIR/DEIS analyze the potential direct and indirect impacts to the wildlife area including effects on existing public uses.

Within the project segment, the highway median and other portions of the right-of-way currently provide foraging habitat for herons, egrets, and raptors. Filling and paving these areas will result in a permanent loss of habitat for these species. DFG recommends Caltrans identify feasible alternatives to filling and paving the median that would meet project objectives. Compensation for unavoidable habitat losses within the median should be developed in conjunction with mitigation for other wetland impacts associated with the project. Construction of median barriers may also inhibit the movement of wildlife (especially small mammals) across the roadway. To minimize potential effects on wildlife movement and reduce roadway mortality, we recommend that Caltrans consider the use of thrie-beam instead of concrete median barriers whenever possible.

The DFG's California Natural Diversity Data Base (CNDDB) indicates that Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*), Point Reyes bird's-beak (*Cordylanthus maritimus* ssp. *palustris*), western lily (*Lilium occidentale*), Lyngbye's sedge (*Carex lyngbyei*), and northern clustered sedge (*Carex arcta*) have been reported from the general vicinity of the proposed project. Western lily is a State and federally listed endangered species. Table 1 (enclosed) summarizes the typical habitats, geographic distribution, number of occurrences in the NDDB, the NDDB State rank, the CNPS list status and the CNPS Rarity-Endangerment-Distribution code for the remaining plant species. Based on this information, the DFG has concluded that these special-status plant species meet the criteria set forth in Section 15380(b) of the CEQA Guidelines and, therefore, must be considered as rare or endangered species per Section 15380(d) of the CEQA Guidelines.

We recommend that field surveys be conducted according to the DFG's ***Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities*** in order to determine whether special status plant species are present in the project impact area. Mitigation measures should be developed in consultation with DFG staff if special-status plant species are identified within the project impact area.

Activities associated with bridge widening and replacement (e.g., pile driving, construction of coffer dams, temporary dewatering of work areas, and others) may result in adverse effects on resident and anadromous fish species within the project area. DFG records indicate that tidewater goby (*Eucyclogobius newberryi*), Northern California steelhead (*Oncorhynchus mykiss*), coastal cutthroat trout (*Oncorhynchus clarkii clarkii*), and coho salmon are known from the project area. The tidewater goby is federally-listed as endangered. According to US Fish and Wildlife Service personnel, this species is present behind tidegates in Gannon Slough as well as in roadside ditches along the highway. Northern California steelhead is federally-listed as threatened and occurs within the Eureka Slough/Freshwater Creek complex within the project area. Coastal cutthroat trout is a California Species of Special Concern and can be found in several of the drainages within the project limits. As mentioned above, coho salmon in the project area are both State and federally-listed as threatened. DFG records indicate that coho are known to use Eureka and Fay Slough as well as Jacoby Creek.

Construction activities in and adjacent to watercourses within the project limits should be carefully planned to avoid and minimize impacts to special-status fish populations and their habitats. A biological assessment should be prepared by a qualified fisheries biologist to evaluate potential impacts of specific construction activities on listed species. If the biological assessment concludes that the project may result in the "take" of a State listed species, Caltrans must consult with the DFG to obtain incidental take authorization pursuant to Fish and Game Code (FGC) Section 2081(b). Alternatively, Caltrans may request a consistency determination pursuant to FGC Section 2080.1 for species such as coho that are listed under both the State and federal endangered species acts. In this event, we strongly recommend that you work with the Department and NOAA Fisheries concurrently to ensure that the Federal biological opinion and incidental take statement are consistent with the requirements of the California Endangered Species Act.

The NOP identifies replacement of tidegates within the project area but does not provide specific locations for this work. This action may provide an opportunity to restore or improve access to spawning and rearing habitats for fish. The DFG is currently working on new tidegate designs for several watercourses in the project area. Data from these projects should be helpful in planning the replacement of tidegates within the project limits.

We recommend that Caltrans coordinate closely with staff from the DFG, US Fish and Wildlife Service and NOAA Fisheries to ensure that tidegates are designed to accommodate the needs of special status fish species.

Thank you for the opportunity to provide comments on this project. For questions or additional information, contact Staff Environmental Scientist Craig Martz at (530) 225-2281 or via E-mail at cmartz@dfg.ca.gov.

Attachments

cc: Messrs. Mark Stopher, Craig Martz,
and Bruce Webb
Department of Fish and Game
601 Locust Street
Redding, California 96001

Mr. Jeff Dayton,
Mss. Vicki Frey, Michelle Gilroy,
and Karen Kovacs
Department of Fish and Game
619 Second Street
Eureka, California 95501

Mr. David Ammerman
US Army Corps of Engineers
Post Office Box 4863
Eureka, California 95502-4863

Ms. Irma Lagomarsino
USDOC - NOAA
National Marine Fisheries Service
1655 Heindon Road
Arcata, California 95521

Mr. Greg Goldsmith
US Fish and Wildlife Service
1655 Heindon Road
Arcata, California 95521

Table 1–Special-status Plant Species Known to Occur in the Vicinity of the Eureka-Arcata Corridor Improvement Project

SPECIES	HABITAT	CALIFORNIA DISTRIBUTION	APPROXIMATE ELEVATIONAL RANGE	NDDB OCCURRENCES	STATE RANK	CNPS LIST	CNPS R-E-D CODE
Northern clustered sedge (*Carex arcta*)	Bogs and fens, North Coast coniferous forest (mesic)	Humboldt, Mariposa, and Tulare counties	100 to 5,500 Feet	7	S1S2	2	2-2-1
Lyngbye's sedge (*Carex lyngbyei*)	Marshes and Swamps (brackish or freshwater)	Del Norte, Humboldt, Mendocino, and Marin counties	0 to200 Feet	16	S2.2	2	2-2-1
Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*)	Marshes and Swamps (coastal salt)	Humboldt, Mendocino, and Marin counties	0 to 40 Feet	27	S2.2	1B	2-2-3
Point Reyes bird's-beak (*Cordylanthus maritimus* ssp. *palustris*)	Marshes and Swamps (coastal salt)	Alameda, Humboldt, Marin, Santa Clara [extirpated], San Mateo [extirpated] and Sonoma counties	0 to 100 Feet	62	S2.2	1B	2-2-2
Western lily (*Lilium occidentale*)	Bogs and fens, Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and Swamps, North Coast coniferous forest (openings)	Del Norte and Humboldt counties	8 to 600 Feet	16	S1.2	1B	3-3-2

NOTES:

CNPS List

1A Plants presumed extinct in California.

1B Plants rare, threatened, or endangered in California and elsewhere.

2 Plants rare, threatened, or endangered in California but more common elsewhere.

4 Limited distribution or infrequent throughout a broader area in California. Not rare but uncommon enough that status should be monitored regularly.

State Rank

S1 Less than 6 element occurrences or less than 1,000 individuals or less than 2,000 acres.

S2 6-20 element occurrences or 1,000-3,000 individuals or 2,000-10,000 acres.

S3 21-100 element occurrences or 3,000-10,000 individuals or 10,000-50,000 acres.

Threat designation (attached to State rank as a second number)

1 Very threatened

2 Threatened

3 No current threats known

CNCNPS R-E-D code

R (Rarity)

1 Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time

2 Distributed in a limited number of occurrences, occasionally more if each occurrence is small

3 Distributed in one to several highly restricted occurrences or present in such small numbers that it is seldom reported

E (Endangerment)

1 Not endangered

2 Endangered in a portion of its range

3 Endangered throughout its range

D (Distribution)

1 More or less widespread outside California

2 Rare outside California

3 Endemic to California

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maureen F. Gorsen, Director
700 Heinz Avenue
Berkeley, California 94710-2721

Arnold Schwarzenegger
Governor

June 26, 2006

Mr. Rodney Parsons, Chief
Caltrans District 1
Environmental Management Branch
P.O. Box 3700
Eureka, California 95520

Dear Mr. Parsons:

Thank you for the opportunity to comment on the Notice of Preparation for the Eureka-Arcata Route 101 Corridor Improvement Project Draft Environmental Impact Report (EIR, SCH # 2001092035). As you may be aware, the California Department of Toxic Substances Control (DTSC) oversees the cleanup of sites where hazardous substances have been released pursuant to the California Health and Safety Code (H&SC), Division 20, Chapter 6.8. As a potential Responsible Agency, DTSC is submitting comments to ensure that the environmental documentation prepared for this project to address the California Environmental Quality Act (CEQA) adequately addresses any remediation which may be required to address any hazardous substances release.

The proposed project consists of various improvements on Route 101 including: closing median crossings; extending existing acceleration and deceleration lanes; constructing an interchange at Indianola Cutoff; replacing the southbound Jacoby Creek Bridge; and widening the northbound Jacoby Creek and Gannon Slough Bridges. DTSC recommends that the historical uses of the areas outside of existing roadways where construction activities will occur be discussed in the Draft EIR. If the historical uses may have included the use of chemicals, DTSC strongly recommends that soil, and possibly groundwater, sampling be conducted to determine if a release of hazardous substances has occurred. The results of sampling should be discussed in the Draft EIR and any human health risk-based screening levels that are used in determining whether contamination poses a potential, significant human health or environmental risk should be identified.

If sampling indicates that a release of hazardous substances has occurred and remediation is required, the cleanup activities that will be performed should be discussed in the Draft EIR along with the cleanup levels that will be applied and the

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anticipated regulatory agency oversight. The impacts associated with remediation should also be addressed by the Draft EIR. If the remediation activities include the need for excavation of contaminated soil, the Draft EIR should include: (1) an assessment of air impacts and health impacts associated with the excavation activities; (2) identification of any applicable local standards which may be exceeded by the excavation activities, including dust levels and noise; (3) transportation impacts from the removal or remedial activities; and (4) risk of upset should there be an accident at the Site.

For the bridge replacement and widening activities, DTSC recommends that excavated soil should be tested to determine if it is a hazardous waste if the soil may have been impacted by lead paint of aerially-deposited lead. If the soil is California hazardous waste as determined by the exceedence of the Total Threshold Limit Concentration or Soluble Threshold Limit Concentration, then H&SC section 25123.3 on the handling and storage of non-RCRA hazardous waste may apply to the project. H&SC section 25157.8 concerning the disposal of lead-contaminated soil greater than 350 parts per million may also apply to this project.

DTSC can assist your agency in overseeing characterization and cleanup activities through our Voluntary Cleanup Program. A fact sheet describing this program is enclosed. We are aware that projects such as this one are typically on a compressed schedule, and in an effort to use the available review time efficiently, we request that DTSC be included in any meetings where issues relevant to our statutory authority are discussed.

Please contact Patrick Lee at (510) 540-3847 if you have any questions. Thank you in advance for your cooperation in this matter.

Sincerely,

Mark E. Piros

Mark E. Piros, P.E.
Unit Chief
Northern California - Coastal Cleanup
Operations Branch

Enclosures

cc: see next page

cc: without enclosures

Governor' s Office of Planning and Research
State Clearinghouse
P. O. Box 3044
Sacramento, California 95812-3044

Guenther Moskat
CEQA Tracking Center
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Arcata Fish and Wildlife Office
1655 Heindon Road
Arcata, CA 95521-5582
Phone: (707) 822-7201 Fax: (707) 822-8411

In Reply Refer To:
File #: 1-14-2002-1078.3

AUG 2 2006

Mr. Rodney J. Parsons
Chief, Eureka Environmental Management Branch, E-1
California Department of Transportation – District 1
P.O. Box 3700
Eureka, CA 95502-3700

Dear Mr. Parsons:

Subject: Comments on Notice of Preparation of an EIR/EIS for the Eureka/Arcata Corridor Improvement Project

This letter is in reply to your written correspondence of May 23, 2006, requesting concurrence by the U.S. Fish and Wildlife Service (Service) on Caltrans' proposed Notice of Preparation (NOP) of an Environmental Impact Report/Statement (EIR/EIS) for the Eureka/Arcata Corridor Improvement Project (01-Hum-101-PM 79.9/86.3; 01 – 363300). Through this correspondence, we submit our comments on your proposed NOP under authority of the Fish and Wildlife Coordination Act (FWCA) and the 1994 National Environmental Policy Act/Clean Water Act Section 404 Integration Process Memorandum of Understanding (NEPA/404 MOU).

Caltrans proposes a number of improvements to the Route 101 corridor from just north of the Eureka Slough Bridge in Eureka to the 11th Street Overcrossing in Arcata. These improvements may include the following elements:

- Construction of a compact diamond interchange at Indianola Cutoff,
- Replacing the southbound Jacoby Creek Bridge and widening the northbound Jacoby Creek and Gannon Slough bridges,
- Closing existing median crossings and removing acceleration and deceleration lanes at 6 locations,
- Constructing a third northbound lane from Cole Avenue to Mid City Motors,
- Replacing tide gates at all current tidegate locations,
- Minor shoulder widening and paving,
- Reconstructing access ramps at the existing Route 101/255 interchange in Arcata,

TAKE PRIDE IN AMERICA

- Paving the median and installing a concrete barrier from South G Street to 11th Street,
- Installing a three-beam median barrier from Eureka Slough Bridge to Airport Road, and
- Removal of existing trees, not currently protected by barriers, within 30 feet of the travel way.

In addition to other work typical to such projects, such as upgraded lighting, overlaying pavement with asphalt concrete (AC), and placing shoulder backing material, we understand that at least one planning alternative may consider a realignment and installation of a lighted traffic signal at the intersection of Route 101 at Airport Road/Jacobs Avenue.

In your correspondence, you list 14 potential environmental issues associated with the proposed project that will be addressed in the EIR/EIS. The Service agrees that the issues identified in your correspondence are appropriate to include in an EIR/EIS for the proposed project. In addition to these 14 issues, however, the Service provides the following comments relative to other issues of concern to our agency and its mandates. We recommend you consider these additional issues during the development of your environmental documentation.

1. Effects to Coastal Wetlands, Tidal Marshes, and Tidal Sloughs

Coastal wetlands, including tidal marsh, tidal sloughs and diked former tidelands occur on both sides of the existing highway as well as within the median. The Service recommends that a wetland delineation be conducted to identify, map, and characterize all wetland habitats along the project impact area. The Draft EIR/EIS should evaluate alternatives that avoid or minimize temporary and permanent adverse impacts to wetlands. Where wetland impacts cannot be avoided, mitigation measures should be developed in consultation with the Service, the U.S. Army Corps of Engineers (Corps), and California Department of Fish and Game (CDFG) to ensure that project improvements will not result in a net loss of wetland acreage or habitat values. Mitigation for permanent wetland impacts should give priority to the restoration of former wetland areas in close proximity to the project site.

In addition, there is currently a high level of interest in the restoration community in restoring tidal flow and estuarine functions on properties immediately adjacent to Route 101 within the proposed Eureka/Arcata Corridor Project. Among others, the City of Arcata has recently completed tidegate augmentation and channel improvements at Gannon Slough and Beith Creek, and anticipates other future restoration activities along lower Jacoby Creek. We strongly encourage Caltrans to engage restoration specialists when designing changes to existing tidegates along Route 101. We also recommend that Caltrans coordinate closely with staff from the Service, CDFG, and NOAA Fisheries to ensure that tidegates are designed to accommodate the needs of special status fish species.

The NOP identifies replacement of tidegates within the project area but does not provide specific locations for this work. This action may provide an opportunity to restore or improve access to spawning and rearing habitats for fish. CDFG and others in the restoration community are currently working on new tidegate designs for several watercourses in and near the project area.

Data from these projects should be helpful in planning the replacement of tidegates within the project limits. The Service is currently working closely with Caltrans staff and others to facilitate a broader understanding of the opportunities for Caltrans to improve adjacent fish habitat and salt marsh through careful consideration of tidegate design and placement.

The Service recommends that Caltrans consider all options available for replacement or augmentation of tidegates as identified in the NOP, and expand this analysis to include alternative proposals to promote fish passage and salt marsh restoration across and within the project footprint.

2. Effects to Fish and Aquatic Organisms

Activities associated with bridge widening and replacement, such as pile driving, construction of coffer dams, and temporary dewatering of work areas, may result in adverse effects to resident and anadromous fish species within the project area. CDFG and Service records indicate that tidewater goby (*Eucyclogobius newberryi*), northern California steelhead (*Oncorhynchus mykiss*), coastal cutthroat trout (*O. clarkii clarkii*), and coho salmon (*O. kisutch*) are known from the project area. The tidewater goby occurs both upstream and downstream of the tidegates in Gannon Slough, in a small quiet water area between the northbound and southbound bridges crossing Jacoby Creek, and within the "101 Slough" running from Eureka Slough to north of the Route 101/Indianola Road intersection. This species may also occur in other minor channels that occur adjacent to, or cross under, Route 101 that have not been surveyed. The northern California steelhead is federally-listed as threatened and occurs within the Eureka Slough/ Freshwater Creek complex near the project area. The coastal cutthroat trout is a California Species of Special Concern and can be found in several of the waterways within the project limits. Coho salmon in the project area are both State and federally-listed as threatened. CDFG records indicate that coho are known to use Eureka and Fay Slough as well as Jacoby Creek.

Construction activities in and adjacent to watercourses within the project limits should be carefully planned to avoid and minimize impacts to special-status fish populations and their habitats. A biological assessment should be prepared by a qualified fisheries biologist to evaluate potential impacts of specific construction activities on listed species. If the biological assessment concludes that the project "may affect" listed species, Caltrans must consult with the Service or the National Marine Fisheries Service, as appropriate, through the Federal Highway Administration to meet the requirements of section 7 of the Endangered Species Act (ESA). The Service anticipates that pile driving, construction of coffer dams, and temporary dewatering of work areas, among other activities, have the potential to affect tidewater gobies, and have the potential to affect other listed fish species as well. Of particular concern to the Service is the potential for pile driving and other in-water work to adversely affect, and potentially "take", tidewater gobies known to occur in Jacoby Creek, Gannon Slough, and the "101 Slough" at the proposed bridge replacement/upgrading and interchange sites. The Service recommends that Caltrans work with the Service and NOAA Fisheries to develop standards for addressing potential pile driving-related take issues, and minimize the risk of that take to the extent feasible.

3. Effects to Plant Species of Concern

Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*), Lyngbye's sedge (*Carex lyngbyei*), and northern clustered sedge (*Carex arcta*) have been reported from the general vicinity of the proposed project, as indicated in the California Natural Diversity Data Base (CNDDB), and have been observed near waterways within and immediately adjacent to the proposed project site. We encourage Caltrans to conduct surveys for these species using guidelines developed by CDFG, avoid adverse effects to these species when possible, and develop mitigation measures in coordination with CDFG and the Service as appropriate to ensure their persistence in the project vicinity.

4. Introduction of Non-Native Species

The Service recommends that Caltrans consider appropriate measures to prevent the introduction of non-native species into the project area, and prevent the spread of unwanted species already in the project area. For example, a small but rapidly expanding population of common reed (*Phragmites australis*), an invasive perennial species, currently exists at the north end of the 101 slough, immediately south of Resale Lumber. The Service is concerned that project-related activities will aid expansion of the species, unless appropriate measures are taken to eradicate it prior to conducting proposed work where the species currently occurs. This species and other invaders may expand their distribution and populations throughout the project area if inadvertently transported by vehicles or during soil movement unless appropriate control and isolation measures are taken. The Service recommends that all alternatives address the potential effects of construction on the introduction and spread of all undesirable, non-native species.

5. Effects on Wildlife Passage

Construction of median barriers may inhibit the movement of wildlife (especially mammals such as foxes and river otters) across the roadway. To minimize potential adverse effects on wildlife movement, reduce roadway mortality, and reduce the risk from vehicle/wildlife collisions, we recommend that Caltrans consider the use of alternative barriers with regularly spaced gaps instead of solid concrete median barriers whenever possible. Gaps should be of appropriate size (generally, about 1 meter wide) to pass small to medium sized mammals, reptiles and amphibians, and should be distributed frequently along the length of the barrier.

Within the project segment, the highway median and other portions of the right-of-way currently provide foraging habitat for herons, egrets, and raptors. Filling and paving these areas will result in a permanent loss of habitat for these species. The Service recommends Caltrans identify feasible alternatives to filling and paving the median that would meet project objectives, wherever the median is currently providing wildlife habitat. Where habitat loss cannot be avoided, compensation should be developed in conjunction with mitigation for other wetland impacts associated with the project.

6. **Effects of Impermeable Surface and Road Contaminants**

The proposed action may alter the amount, location, and proximity of additional impermeable surface to waterways used by listed species and other fish and wildlife. This new impermeable surface, if not designed to include retention basins for storage and biofiltration, has the potential to introduce pollutants from vehicular use, such as petroleum products and antifreeze, directly into adjacent waterways. The Service recommends that Caltrans identify the amount of additional impermeable surface anticipated to be created as a result of implementing the proposed action, analyze the effects of increases in impermeable surface, and propose methods, including biofiltration, to remedy such effects.

Thank you for the opportunity to provide comments on this NOP. Please direct any questions or requests for additional information to Ray Bosch at (707) 822-7201 or via email at ray.bosch@fws.gov.

Sincerely,

Michael M. Long
Field Supervisor

cc:
California Department of Fish and Game, Redding California (Attn: Craig Martz)
California Department of Fish and Game, Eureka (Attn: Karen Kovacs)
California Department of Fish and Game, Eureka (Attn: Michelle Gilroy)
California Department of Fish and Game, Eureka (Attn: Vicki Frey)
Army Corps of Engineers, Eureka (Attn: Carol Heidsiek)
NOAA Fisheries, Arcata (Attn: Irma Lagomarsino)
NOAA Fisheries, Arcata (Attn: Diane Ashton)
USFWS, Humboldt Bay National Wildlife Refuge, Loleta (Attn: Eric Nelson)

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

November 29, 2006

Reply To: FHWA061012A

Rod Parsons, Chief
North Region Environmental Management Branch E1
Department of Transportation
District 1
PO Box 3700
Eureka, CA 95502-3700

Re: Determinations of Eligibility for the Proposed Eureka-Arcata Corridor Projects in Humboldt County, CA

Dear Mr. Parsons:

Thank you for consulting with me about the subject undertaking in accordance with the *Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA).

Caltrans is requesting my concurrence, pursuant to Stipulation VIII.C.5 of the PA, in its determination that the following properties are not eligible for the National Register of Historic Places (NRHP):

- 2846 Jacobs Avenue
- 3008 Jacobs Avenue
- 3130 Jacobs Avenue
- 3134 Jacobs Avenue
- 3346 & 3348 Jacobs Avenue
- 3324 & 3360 Jacobs Avenue
- 3408 Jacobs Avenue
- 3428 Jacobs Avenue
- 3824 Jacobs Avenue
- 3956 Jacobs Avenue
- 6700 N Highway 101
- 4056 N Highway 101
- Tidegates and ditch
- Eucalyptus Trees
- Portions of Flanigan, Brosnan & Company Railroad
- Portions of Freshwater Railroad
- Portions of the Northwestern Pacific Railroad

EIS No. 20070268, Final EIS, GSA, VT, U.S. Commercial Port of Entry, Replacing existing Station at Route I-91, Design and Construction, Derby Line, Vermont. *Wait Period Ends:* 08/06/2007. *Contact:* Glenn C. Rotondo 617-565-5694.

EIS No. 20070269, Draft EIS, IBR, CA, Lower Yuba River Accord, Proposal to Resolve Instream Flow Issues Associated with Operation, Yuba River, Yuba County, CA. *Comment Period Ends:* 08/24/2007. *Contact:* Tamara LaFramboise 916-978-5269.

EIS No. 20070270, Draft EIS, NRC, MD, License Renewal of the National Bureau of Standards Reactor (NBSR), Renew the Operating License for an Addditional 20 Years, National Institute of Standards and Technology (NIST), NUREG-1873, Montgomery County, MD. *Comment Period Ends:* 09/05/2007. *Contact:* Dennis Beissel 301-415-2145.

EIS No. 20070271, Final EIS, AFS, WI, Fishbone Project Area, Vegetation and Road Management, Implementation, Washburn Ranger District, Chequamegon-Nicolet National Forest, Bayfield County, WI. *Wait Period Ends:* 08/06/2007. *Contact:* Jennifer Maziasz 715-373-2267 Ext 235.

EIS No. 20070272, Draft EIS, STB, UT, Central Utah Rail Project, Six Counties Association of Governments, Construction and Operation Exemption Rail Line between Levan and Salina, Right-of-Way Application, Docket No. FD 34075, Sanpete, Sevier, Juab Counties, UT. *Comment Period Ends:* 08/22/2007. *Contact:* Phillis Johnson-Ball 202-245-0304.

EIS No. 20070273, Draft Supplement, MMS, 00, Eastern Planning Area Outer Continental Shelf (OCS) Oil and Gas Lease Sale 224, Gulf of Mexico Offshore Marine Environment and Coastal Marshes/Counties of LA, MS, AL, and North Western Florida. *Comment Period Ends:* 08/20/2007. *Contact:* Dr. Sally Valdes 703-787-1707.

EIS No. 20070274, Draft EIS, COE, MD, Atlantic Coast of Maryland Shoreline Protection Project, Proposed Dredging of Several New Offshore Shoals to Provide Sand for Borrow Sources from 2010 to 2044, Ocean City, Worcester County, MD. *Comment Period Ends:* 08/28/2007. *Contact:* Christopher Spaur 410-962-6134.

EIS No. 20070275, Draft EIS, FHW, CA, Eureka-Arcata Route 101 Corridor Improvement Project, Proposed Roadway Improvements on Route 101 between the Eureka Slough Bridge and 11th St. Overcrossing in Arcata, Humbolt County, CA. *Comment Period Ends:* 08/24/2007. *Contact:* Lanh Phan 916-498-5046.

EIS No. 20070276, Draft Supplement, COE, MS, Pascagoula Harbor Navigation Channel Project, To Construct Congressionally Authorized Widening and Deepening Improvements, To Update the FEIS-1985, Jackson County, MS. *Comment Period Ends:* 08/20/2007. *Contact:* Jenny L. Jackson 251-690-2724.

EIS No. 20070277, Draft EIS, CGD, AL, Bienville Offshore Energy Terminal Deepwater Port License Application, Proposes to Construct and Operate a Liquefied Natural Gas Receiving and Regasification Facility, Outer Continental Shelf of the Gulf of Mexico, South of Fort Morgan, AL. *Comment Period Ends:* 08/20/2007. *Contact:* Mary Jager 202-372-1454.

EIS No. 20070278, Draft EIS, FHW, CA, Tier 1—Placer Parkway Corridor Preservation Project, Select and Preserve a Corridor for the Future Construction from CA-70/99 to CA 65, Placer and Sutter Counties, CA. *Comment Period Ends:* 08/20/2007. *Contact:* Cesar Perez 916-498-5065.

EIS No. 20070279, Final EIS, AFS, WA, White Pass Expansion Master Development Plan, Implementation, Naches Ranger District, Okanogan-Wenatchee National Forests and Cowlitz Valley Ranger District, Gifford Pinchot National Forest, Yakima and Lewis Counties, WA. *Wait Period Ends:* 08/06/2007. *Contact:* Randy Shepard 509-653-1446.

EIS No. 20070280, Final EIS, USA, VA, Fort Belvoir 2005 Base Realignment and Closure (BRAC). Recommendations and Related Army Actions, Implementation, Fairfax County, VA. *Wait Period Ends:* 08/06/2007. *Contact:* Bob Ross 703-602-2878.

Dated: July 2, 2007.

Robert W. Hargrove,

Director, NEPA Compliance Division, Office of Federal Activities.

[FR Doc. E7-13095 Filed 7-5-07; 8:45 am]

BILLING CODE 6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

[EPA-HQ-OPP-2007-0402; FRL-8136-8]

Bioban P-1487 Risk Assessment; Notice of Availability and Risk Reduction Options

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: This notice announces the availability of EPA's risk assessments, and related documents for the pesticide Bioban P-1487, and opens a public comment period on these documents. The public is encouraged to suggest risk management ideas or proposals to address the risks identified. EPA is developing a Reregistration Eligibility Decision (RED) for Bioban P-1487 through a modified, 4-Phase public participation process that the Agency uses to involve the public in developing pesticide reregistration decisions. Through this program, EPA is ensuring that all pesticides meet current health and safety standards.

DATES: Comments must be received on or before September 4, 2007.

ADDRESSES: Submit your comments, identified by docket identification (ID) number EPA-HQ-OPP-2007-0402, by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the on-line instructions for submitting comments.
- *Mail:* Office of Pesticide Programs (OPP) Regulatory Public Docket (7502P), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460-0001.
- *Delivery:* OPP Regulatory Public Docket (7502P), Environmental Protection Agency, Rm. S-4400, One Potomac Yard (South Bldg.), 2777 S. Crystal Dr., Arlington, VA. Deliveries are only accepted during the Docket's normal hours of operation (8:30 a.m. to 4 p.m., Monday through Friday, excluding legal holidays). Special arrangements should be made for deliveries of boxed information. The Docket Facility telephone number is (703) 305-5805.

Instructions: Direct your comments to docket ID number EPA-HQ-OPP-2007-0402. EPA's policy is that all comments received will be included in the docket without change and may be made available on-line at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through regulations.gov or e-mail. The Federal regulations.gov website is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through regulations.gov, your e-mail address will be automatically

Dated: July 30, 2007.

Robert W. Hargrove,

Director, NEPA Compliance Division, Office of Federal Activities.

[FR Doc. E7–15116 Filed 8–2–07; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[ER–FRL–6689–5]

Environmental Impacts Statements; Notice of Availability

Responsible Agency: Office of Federal Activities, General Information (202) 564–7167 or *http://www.epa.gov/compliance/nepa/.*

Weekly receipt of Environmental Impact Statements Filed July 23, 2007 Through July 27, 2007. Pursuant to 40 CFR 1506.9.

EIS No. 20070315, Draft EIS, NOA, AK, Alaska Eskimo Whaling Commission for a Subsistence Hunt on Bowhead Whale for the Years 2008 through 2012 for Issuing Annual Quotas, Proposes to Authorize Subsistence Harvests of the Western Arctic Stock of Bowhead Whales, Bering, Chukchi and Beaufort Seas, AK.
Comment Period Ends: October 12, 2007.
Contact: Steven K. Davis, 907–271–3523.

EIS No. 20070316, Draft EIS, FHW, 00, Northern Corridor Interstate 73 Project, Proposes Construct from I–95 to Future Interstate 74, Marlboro and Dillion Counties, SC and Richmond County, NC.
Comment Period Ends: September 17, 2007.
Contact: Patrick Tyndall, 803–765–5460.

EIS No. 20070317, Draft EIS, FHW, NH, I–93 Exit 4A Interchange Study Derry-Londonderry Project, To Reduce Traffic Congestion Improve Safety for Public and Promote Economic Vitality, Rockingham County, NH, Comment Period Ends: September 17, 2007.
Contact: William F. O'Donnell, 603–228–3057 Ext. 101.

EIS No. 20070318, Final EIS, FHW, CA, Los Banos Bypass Project, Construct from CA–152 in Merced County beginning near Volta Road west to Los Banos, bypassing Los Banos, ending near the Santa Fe Grade Road, U.S. Army COE Section 404 Permit, Merced County, CA.
Wait Period Ends: September 4, 2007.
Contact: Mayela Sosa, 916–498–5057.

EIS No. 20070319, Final EIS, USN, FL, Boca Chica Field, Restoration of Clear Zones and Stormwater Drainage Systems, Implementation, Naval Air Station (NAS) Key West, Monroe County, FL.
Wait Period Ends: September 4, 2007.
Contact: Jim Reed, 843–820–45543.

EIS No. 20070320, Final EIS, WPA, AZ, San Luis Rio Colorado Project, Proposes to Construct a 26-Mile Long 230 Kilovolt Double-Circuit Transmission Line from the International Border with Mexico to Western and Arizona Public Service Substations near Yuma County, AZ.
Wait Period Ends: September 4, 2007.
Contact: Mark Wieringa, 720–962–7448.

EIS No. 20070321, Final EIS, NOA, 00, Amendment 27 to the Reef Fish Fishery Management Plan and Amendment 14 to the Shrimp Fishery Management Plan, To Address Stock Rebuilding and Overfishing of Red Snapper, Gulf of Mexico.
Wait Period Ends: September 4, 2007.
Contact: Roy E. Crabtree, 727–824–5305.

EIS No. 20070322, Draft EIS, NPS, AZ, Saguaro National Park General Management Plan, Implementation, Rincon Mountain District and Tucson Mountain District, Pima County, AZ.
Comment Period Ends: September 17, 2007.
Contact: Mary McVeigh, 303–969–2442.

EIS No. 20070323, Draft EIS, FHW/FTA, CO, US–36 Corridor, Multi-Modal Transportation Improvements between I–25 in Adams County and Foothills Parkway/Table Mesa Drive in Boulder, Adams, Denver, Broomfield, Boulder and Jefferson Counties, CO.
Comment Period Ends: September 17, 2007.
Contact: Douglas Bennett, 720–963–3030.
The DOT/FHW and DOT/FTA are Joint Lead Agencies for the above project.

EIS No. 20070324, Final EIS, FAA, 00, New York/New Jersey/Philadelphia Metropolitan Area Airspace Redesign Project, To Increase the Efficiency and Reliability of the Airspace Structure and Air Traffic Control System, NY, NJ and PA.
Wait Period Ends: September 4, 2007.
Contact: Steve Kelly, 718–553–2610.

EIS No. 20070325, Final EIS, NRC, MA, Generic—License Renewal of Nuclear Plants, Supplement 29 to NUREG–1437, Regarding the License Renewal of Pilgrim Nuclear Power Station, Cape Cod Bay, Town of Plymouth, Plymouth County, MA.
Wait Period Ends: September 4, 2007.
Contact: Alicia Washington 301–415–1878.

EIS No. 20070326, Draft EIS, FTA, TX, University Corridor Fixed Guideway Project, To Implement Transit Improvements from Hillcroft Transit Center to the Vicinity of the University of Houston (UH)—Central Campus or the Eastwood Transit Center, City of Houston, Harris County, TX.

Comment Period Ends: September 17, 2007.

Contact: John Sweek, 817–978–0550.

EIS No. 20070327, Draft EIS, FTA, TX, Denton to Carrollton Regional Rail Corridor Project, Transportation Improvements between Downtown Denton and the Dallas Area Rapid (DART) System, Right-of-Way Grant, Denton and Dallas Counties, TX, Comment Period Ends: September 19, 2007.

Contact: Robert C. Patrick, 817–978–0550.

Amended Notices

EIS No. 20070275, Draft EIS, FHW, CA, Eureka-Arcata Route 101 Corridor Improvement Project, Proposed Roadway Improvements on Route 101 between the Eureka Slough Bridge and 11th St. Overcrossing in Arcata, Humbolt County, CA, Comment Period Ends: September 28, 2007.

Contact: Lanh Phan, 916–498–5046.

Revision of FR Notice Published July 6, 2007.

Extending Comment from August 24, 2007 to September 28, 2007.

EIS No. 20070312, Draft EIS, USN, HI, Hawaii Range Complex (HRC) Project, To Support and Maintain Navy Pacific Fleet Training, and Research, Development, Test, and Evaluation (RDT&E) Operations, Kauai, Honolulu, Maui and Hawaii Counties, HI, Comment Period Ends: September 17, 2007.

Contact: Tom Clements, 866–767–3347.

Revision of FR Notice Published July 27, 2007.

Extending Comment Period from September 10, 2007 to September 17, 2007.

Dated: July 31, 2007.

Clifford Rader,

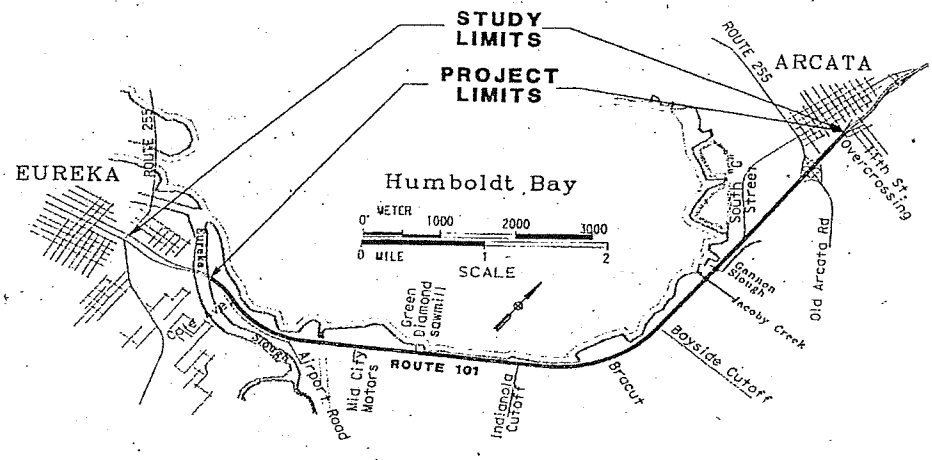
Environmental Protection Specialist, Office of Federal Activities.

[FR Doc. E7–15115 Filed 8–2–07; 8:45 am]

BILLING CODE 6560–50–P

PUBLIC NOTICE

Announcement of Draft Environmental Impact Report/Statement Availability and Public Hearing for the Proposed Route 101 Eureka-Arcata Corridor Improvement Project



WHAT'S BEING PLANNED: The California Department of Transportation (Caltrans), the Humboldt County Association of Governments, and the Federal Highway Administration (FHWA) are proposing a project to enhance the safety, operation, and serviceable life of Route 101 from the north end of Eureka Slough Bridge to the 11th Street Overcrossing in Arcata. Depending on the project Alternative, major project features could include closing Route 101 median crossings; constructing an interchange at Route 101/Indianola Cutoff; realigning and signalizing Airport Road, extending existing acceleration and deceleration lanes; replacing the Jacoby Creek southbound Bridge, and widening the northbound Jacoby Creek and Gannon Slough Bridges. It is anticipated that this project may have substantial impacts. Therefore, Caltrans prepared a Draft Environmental Impact Report/Statement (EIR/S) as the appropriate environmental document in compliance with State and Federal environmental regulations.

WHERE YOU COME IN: The Draft Environmental Impact Report/Statement is available for public review. You can review or purchase the Draft Environmental Impact Report/Statement at the Caltrans District 1 Office 1656 Union Street in Eureka on weekdays from 9 AM to 4 PM. Maps and other information are also available. The document is available to review and download at the Caltrans District 1 website **http://www.dot.ca.gov/dist1/d1projects/envdocs.htm**
There are also copies of the document available for review at the Arcata Branch Library, 500 7th Street, Arcata; and the Main Library – Eureka, 1313 3rd Street, Eureka.

After reviewing the report/statement, if you have questions or comments about the potential project impacts or if you believe information that should be included was omitted, you may submit your written comments **before August 24, 2007**, to Caltrans at the address below. Your comments will be part of the public record.

The public is also invited to attend a public hearing, and review current project alternative displays, visual simulations of the proposed project, traffic modeling results, socioeconomic study results, and other project related information. Staff will be available to answer questions. Comment cards will be available at the meeting, or if you are unable to attend, **written comments may be postmarked no later than August 24, 2007** to Caltrans, Attn: Kim Floyd, Project Manager, P.O. Box 3700, Eureka, CA 95502-3700.

WHEN AND WHERE: The public hearing will be held from 5 to 8 PM on Tuesday, August 7, 2007 at the Adorni Center, 1011 Waterfront Drive, Eureka. There will be no formal presentation; you may attend any time between 5 to 8 PM.

CONTACT: For more information about this project, contact Kim Floyd, the Project Manager at (707) 441-5739, or Mitchell Higa, Environmental Management Branch at (707) 441-5855.

For individuals with sensory disabilities, this notice is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please write to the Caltrans District 1 Environmental Management Branch, P.O. Box 3700, Eureka, CA 95502-3700 or call (707) 441-5855. Individuals who require special accommodation (American Sign Language interpreter, accessible seating, documentation in alternate formats, etc.) are requested to contact the District 1 Public Information Officer at (707) 441-3998 at least 21 days prior to the scheduled hearing date. TDD users may contact the California Relay Service TDD line at 1-800-735-2929 or Voice Line at 1-800-735-2922.

State of California • Department of Transportation

NEWS RELEASE

08-160

Today's Date: Friday, December 12, 2008
District: 1
Contact: Julie East
Phone: (707) 441-3998

FOR IMMEDIATE RELEASE

EUREKA-ARCATA ROUTE 101 CORRIDOR UPDATE

Eureka – Caltrans recently introduced two modified alternatives for the Eureka-Arcata Route 101 Corridor Improvement Project, developed in response to public input. Caltrans is now seeking input on these modified alternatives, which will be considered along with the original alternatives.

Alternative 1A, the first modified alternative, involves closing median crossings, adding turnarounds at three locations, and a signal for southbound left turns only at Airport Road. The turnarounds would eliminate broadside collisions and reduce out-of-direction travel.

Alternative 3A, the second modified alternative, involves closing median crossings, adding a signal for southbound left turns only at Airport Road, and building an interchange at Indianola with steeper side slopes than the original proposed interchange.

Please mail written comments to Kim Floyd, Project Manager, PO Box 3700, Eureka, CA 95502. **Public comments are due by December 20, 2008.**

Please visit the project website, http://www.dot.ca.gov/dist1/d1projects/eureka_arcata/, for more information on the modified alternatives and the original alternatives. You may also contact Kim Floyd, Project Manager, at 707-441-5739 or Kim_Floyd@dot.ca.gov.

###

SLOW FOR THE CONE ZONE
CALTRANS

Times-Standard

Caltrans seeks public input

The Times-Standard

Posted: 12/01/2008 01:15:18 AM PST

Caltrans will hold an informational public meeting on its Eureka-Arcata Route 101 Corridor Improvement Project from 5 to 7 p.m. Wednesday at Eureka's Wharfinger Building, 1 Marina Way.

The purpose of the meeting is to introduce two modified alternatives for the project, which were developed in response to public input.

"Alternative 1A," as it's being dubbed, involves closing the median crossings along the corridor, adding turnarounds at three locations and a signal for southbound left turns at Airport Road only. The turnarounds would eliminate broadside collisions and reduce out-of-direction travel, according to a Caltrans press release.

"Alternative 3A," as it's being dubbed, involves closing median crossings along the corridor, adding a signal for southbound left turns at Airport Road only, and building an interchange at Indianola with steeper side slopes than the originally proposed interchange.

Caltrans is seeking public input on these modified alternatives, which will be considered with the original three options.

Members of the public will also have the opportunity Wednesday to weigh in on Caltrans' proposed removal of eucalyptus trees along the corridor to make way for longer acceleration and deceleration lanes for large trucks entering and leaving the corridor.

For more information, contact Project Manager Kim Floyd at 441-5739 or Kim_Floyd@dot.ca .gov.

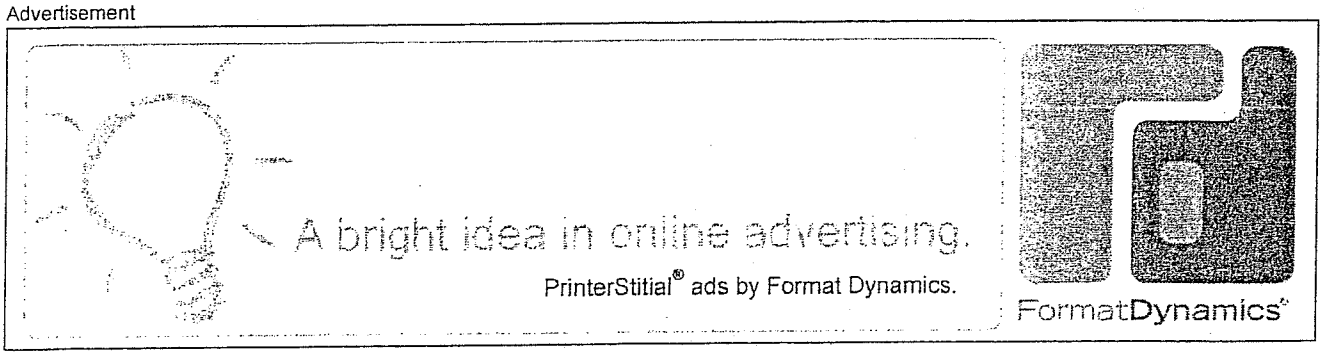
If You Go

What: Caltrans 101 Corridor Project meeting

When: 5 to 7 p.m. Wednesday

Where: Wharfinger Building, 1 Marina Way in Eureka

Advertisement



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Appendix L Coastal Act Federal Consistency Determination

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105- 2219
VOICE (415) 904- 5200
FAX (415) 904- 5400
TDD (415) 597-5885

Th 14a

Filed:	2/8/13
3 Months:	5/8/13
6 Months:	8/8/13
Extended (Stayed) to:	9/20/13
Hearing Date:	9/12/13
Commission Vote:	9-1
Staff:	M. Delaplaine-SF
Staff Report/Findings:	10/29/13
Hearing on Findings:	11/14/13

REVISED FINDINGS ON CONSISTENCY CERTIFICATION

Consistency Certification No.:	**CC-016-13**
Applicant:	**California Department of Transportation (Caltrans)**
Location:	Route 101, between the Eureka Slough Bridge, Eureka, and the 11th St. overcrossing, Arcata, east side of Humboldt Bay, Humboldt Co. (Exhibit 1)
Project Description:	Construction of the Eureka - Arcata Route 101 Corridor Improvement Project (Exhibits 2-3, 5-7, & 10-11)
Commission Action:	Conditional Concurrence
Prevailing Commissioners:	Commissioners Brennan, Duclos, Faustinos, Groom, McClure, Mitchell, Vargas, Zimmer, and Vice-Chair Kinsey

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Note: To accurately reflect the Commission's action, staff's modifications to the August 29, 2013, Staff Recommendation are shown herein as ~~strikethrough~~ and <u>underline</u> text. The recommended modifications are in the following sections:

Summary, pages 2-4.
Table of Contents, page 5.

Section I (Action, Motion, Resolution, and Conditions), pages 6-8.
Section III. B (Background), page 14.
Section III (Responses to Comments), pages 18-21.
Section III. F (Wetlands), pages 25-31 (allowable use), 32, 34, 37-41 (alternatives), and 46-47 (mitigation).
Section III. G (Public Views), page 50.
Section III. H (Public Access & Recreation), page 54-55.
Section III. I (Public Works), pages 57-58.
Section IV (Procedure if CCC Conditionally Concurs), pages 58-59.
Section V (Right of Appeal), page 60.

SUMMARY OF COMMISSION ACTION~~STAFF RECOMMENDATION~~

The California Department of Transportation (Caltrans) proposes to construct the Eureka - Arcata Route 101 Corridor Improvement Project in Humboldt County. The primary purpose of the project is to improve safety by eliminating uncontrolled left turn moves at six intersections. Historically, the majority of collisions resulting in serious injuries or fatalities on Route 101 between Eureka and Arcata have occurred at the at-grade intersections (with collision rates exceeding statewide averages as shown in Exhibit 4). Secondary project purposes are reducing operational conflicts and delay, roadway rehabilitation to meet current design standards, and extending pavement service life. Major project features include closing median crossings (i.e., eliminating uncontrolled turns across oncoming traffic lanes - Exhibit 6), constructing an interchange at Indianola Cutoff (Exhibits 7-8), replacing the southbound Jacoby Creek Bridge (Exhibit 10), and partially signalizing the Route 101/Airport Road intersection (Exhibit 5).

The standard of review for Commission's review of federal consistency certifications is whether the project is consistent with the enforceable policies of the California Coastal Management Program (i.e., with Chapter 3 of the Coastal Act).

The project would result in the permanent fill of 10.3 acres of wetlands. The ~~staff recommends the~~ Commission ~~find~~ agrees with ~~the project inconsistent with the allowable use, alternatives, and mitigation tests of the Coastal Act's wetland fill policy (Section 30233(a)).~~ Caltrans ~~has argued~~ that ~~it~~ the project meets the allowable use test of Section 30233(a) of the Coastal Act because it serves an incidental public service purpose, and because it is ~~. However, the proposed interchange at Indianola Cutoff (a major component of the project) would require some of the wetland fill mentioned above and would increase the highway capacity at that intersection. Based on historic Commission interpretations of the "incidental public service purpose" language, as informed by controlling court cases, road expansions only qualify as incidental public services if they are~~ "necessary to maintain *existing* capacity." ~~and where there is "no other alternative." Thus, the project does not qualify as an incidental public service, and it does not qualify as any of the other allowable uses either.~~

The Commission also agrees with Caltrans that the project is consistent with the alternatives test of Section 30233(a) because it would, if modified as conditioned, represent ~~In addition, even for projects that meet the allowable use test, Section 30233(a) still only allows them to proceed if the Commission finds that there is no feasible less~~the least environmentally damaging feasible alternative. ~~The staff recommends the Commission find that the project does not represent the~~

~~least environmentally damaging feasible alternative. The staff believes a "signalized intersection" at Indianola would be feasible and less environmentally damaging because it would avoid or lessen the effects from the proposed Indianola Interchange, which would include 240,000 cu. yds. of grading, significant natural landform alteration, 25 ft. high fill slopes, adverse effects on scenic public views and the visual character of the area, growth inducement, and potential prejudice to sea level rise planning options.~~ The Commission found that the principal alternative advanced as less environmentally damaging (some form of signalization at the Indianola intersection instead of the construction of the Indianola interchange) would not be feasible due to safety concerns, and no other less environmentally damaging feasible alternatives were identified.

Section 30233(a) also requires that whenever wetland fill is allowed, the project include feasible mitigation measures to minimize adverse environmental effects. The lands on which Caltrans proposes wetland mitigation (in the form of restoration projects) are mostly wetland and in agricultural operation. Separate from the wetland fill provisions, the Coastal Act limits the conversion of agricultural lands. The Commission has historically not allowed lands in agricultural production in the Humboldt Bay area to be converted to wetland for mitigation purposes. However, the Commission has approved the conversion of agricultural lands to wetlands when: (1) proposed as an independent restoration project; (2) the project presents a conflict between Chapter 3 policies and there are no alternatives to avoid the conflict; and (3) the Commission finds that the restoration is, on balance, most protective of significant coastal resources. Thus, if Caltrans can demonstrate that there are no other (non-agricultural) lands available to use for mitigation, the Commission could consider allowing the use of agricultural lands for mitigation purposes under this sort of approach. Because Caltrans has presented evidence of the limited availability of lands susceptible to wetland restoration in the Humboldt Bay area, the ~~staff is recommending that the~~ Commission finds that ~~if the other two wetland tests could be met, that~~ Caltrans could likely meet the mitigation test on the two sites proposed (Demello and Samoa) by agreeing to Condition 3 (Wetland Mitigation) by which it would, ~~if~~ prior to any subsequent Commission review of a coastal development permit for the project~~, Caltrans would~~: (1) expand the Samoa restoration concept to include true tidal restoration; (2) provide a biological analysis showing that adequate acreages and/or habitat mixes would, in fact, fully mitigate the project's impacts; (3) submit and receive Commission approval of coastal development permits for the restoration activities at the two sites; and (4) follow up on Caltrans' commitment to further substantiate the unavailability and infeasibility of non-agricultural sites in the Humboldt Bay area.

The ~~staff recommends the~~ Commission finds that the visual impacts from the proposed Indianola Interchange, with its raised elevation and 240,000 cu. yds. of grading, could be mitigated through the removal of billboards and other overhead infrastructure along the corridor and widening of the view towards the bay through the interchange, and thus that if modified in accordance with Condition 2 (Visual Impact Mitigation), the project would be ~~is in~~ consistent with the scenic view protection policy (Section 30251) of the Coastal Act.~~, because it would not minimize alteration of natural landforms, would degrade scenic public views, and would be not be compatible with the character of the surrounding area.~~ The ~~staff also recommends the~~

Commission finds that the~~is~~ project~~interchange~~ would not be growth-inducing ~~(by removing a constraint to growth) and~~ in a manner that would make it inconsistent with the public works policy (Section 30254) of the Coastal Act.

The ~~staff recommends the~~ Commission finds that the project could be found~~is in~~ consistent with the public access and recreation policies of the Coastal Act (Sections 30210-30214) if it were modified to include a commitment that project construction would not commence until assurances were in place that would provide for the implementation of a ~~because it does not sufficiently further statewide Coastal Trail goals by including a~~ separated bicycle and pedestrian path component along ~~or otherwise provide for~~ a parallel Coastal Trail. Such assurances could be provided through Caltrans' agreement with Condition 1 (Coastal Trail Planning). ~~does allow bicyclists to use this stretch of Route 101; commuters between Eureka and Arcata regularly use it for bicycle transportation. However, by "speeding up" the traffic flow it may become less safe for bicyclists, and closure of medians would make some bicycle trips longer. To address the Coastal Trail needs and public access and recreation policies the staff is recommending that the Commission find that EITHER the project needs to be modified to include at least an interim Coastal Trail in the form of a separated bicycle/pedestrian pathway along the highway shoulder, OR that Caltrans will need to commit, at this time, that it will establish, to the Commission's satisfaction, no later than at the coastal development permit stage of the Commission's review, that an alternative parallel trail nearby (from Arcata to Eureka) will be funded prior to or concurrent with any construction of the 101 Corridor, and that it will have the necessary ownership interests or permissions to be allowed to proceed.~~

~~For the above reasons, the staff is recommending that the Commission **object** to Caltrans' consistency certification. Measures that would allow the project to be found consistent with the Coastal Act are listed on page 54.~~

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APPENDICES

Appendix A – Substantive File Documents

Note: Paper copies of this version of the findings will be printed without exhibits. To view the exhibits, contact the Commission staff, or go to either the electronic copy that will be posted on the Commission's November 14, 2013 agenda (item Th 14a), or the previous September 12, 2013 agenda, which can be found at: http://documents.coastal.ca.gov/reports/2013/9/Th12a-9-2013.pdf

EXHIBITS

Exhibit 1 – Project Location
Exhibit 2 – Project Components/Aerial Photo
Exhibit 3 – Intersection Locations
Exhibit 4 – Caltrans Pre- and post-Safety Corridor Accident Statistics Graph
Exhibit 5 – Airport Rd Half Signal
Exhibit 6 – Closed Medians for Mid-City Motors, Redwood Lumber, Bracut, and Bayside Cutoff
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Exhibit 9 – Signalized treatment for Indianola (NOT proposed by Caltrans)
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Exhibit 13 – Alternatives Comparison Chart
Exhibit 14 – Caltrans Cover Memo June 17, 2013, Response to CCC staff concerns
Exhibit 15 – Caltrans chart -Wetland impacts from a signalized approach
Exhibit 16 – Caltrans July 17, 2012, Memo Traffic Operations Chief
Exhibit 17 – Caltrans June 28, 2012, Issue Paper – Safety Analysis of Signalization at Indianola
Exhibit 18 – Caltrans Analysis of Two Signal Corridor Scenario June 14, 2013

Exhibit 19 – Caltrans Response to Walmart Traffic Study, April 1, 1993
Exhibit 20 – Route Concept Report, Route 101 Corridor, p. 17
Exhibit 21 – Proposed Demello and Somoa Wetland Restoration Sites
Exhibit 22 – Caltrans Response to CCC Staff Comments on Wetland Mitigation/Restoration Plan
Exhibit 23 – Caltrans Indianola Interchange Visual Simulations
Exhibit 24 – County LCP Scenic Area Maps
Exhibit 25 – Caltrans List - Mitigation Options Pursued and Rejected
Exhibit 26 – Caltrans Review of Barrier Separated Trail
Exhibit 27 – Traffic Analysis for Humboldt Baykeeper, Moule and Barber, Aug. 2013
Exhibit 28 – Caltrans August 27, 2013 Response to 6/27/2013 Staff Recommendation
Exhibit 29 – Correspondence

I. COMMISSION ACTION, MOTION, RESOLUTION, AND CONDITIONS

A. CONDITIONAL CONCURRENCE

On September 12, 2013, by a vote of 9 in favor, 1 opposed, the Commission conditionally concurred with the consistency certification submitted by Caltrans on the grounds that if modified as conditioned, the project would be consistent with the policies of Chapter 3 of the Coastal Act.

B. MOTION AND RESOLUTION

Staff recommends that the Commission adopt the following motion in support of its decision:

Motion

> ***I move that the Commission adopt the following findings in support of its conditional concurrence with Caltrans' consistency certification CC-016-13.***

The staff recommends a YES vote on this motion. Pursuant to section 30315.1 of the Coastal Act, adoption of findings requires a majority vote of the members of the prevailing side present at the September 12, 2013, hearing, with at least three of the prevailing members voting. Only those Commissioners on the prevailing side of the Commission's action are eligible to vote. A yes vote by the majority of the prevailing Commissioners listed on page 1 of this report will result in adoption of these findings.

Resolution to Adopt Revised Findings

The Commission hereby adopts the findings set forth below in support of its September 12, 2013 conditional concurrence with consistency certification CC-016-13, submitted by Caltrans for the proposed project, on the grounds that the findings support and accurately reflect the reasons for the Commission's September 12, 2013 conditional concurrence and determination that if modified as conditioned, the project would be consistent with the CCMP.

~~**Motion:**~~

~~*I move that the Commission **concur** with Caltrans' consistency certification CC-016-13 that the project described therein is consistent with the enforceable policies of the California Coastal Management Program (CCMP).*~~

~~The staff recommends a **NO** vote on the motion. Failure of this motion to pass will result in an objection to the certification and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.~~

~~**Resolution:**~~

~~*The Commission hereby **objects** to the consistency certification by Caltrans, on the grounds that the project described therein is inconsistent with the enforceable policies of the CCMP.*~~

C. CONDITIONS

1. **Coastal Trail Planning**. Construction of the Route 101 Corridor Improvements will not commence until adequate commitments are in place to assure that a separate Class 1 bike and pedestrian trail, parallel to Route 101 from Arcata to the northern end of downtown Eureka, will be constructed and operational by the time the major project components are completed. Such commitments will include, but may not be limited to, assurances that adequate funding for construction of the trail exists, as well as a demonstration that the necessary assurances are in place to secure ownership interests or permissions to enable the trail construction to proceed in a timely manner, prior to or concurrent with construction of the corridor improvements.

2. **Visual Impact Mitigation**. Prior to or concurrent with its submittal to the Commission of a coastal development permit application for the project at issue, Caltrans will develop and submit a plan to the satisfaction of the Executive Director to provide mitigation for the visual impacts of the project by removing, to the maximum extent feasible, all billboards along the corridor, as well as other overhead infrastructure (such as power poles and power lines), and by steepening the inside slopes proposed for the Indianola interchange to maximize the view towards the bay from Indianola Cutoff. Caltrans will implement the approved plan.

3. **Wetland Mitigation.** Prior to or concurrent with its submittal to the Commission of a coastal development permit application for the project at issue, Caltrans will: (1) expand the Samoa restoration concept to include true tidal restoration; (2) provide a biological analysis showing that the acreages are adequate and/or habitat mixes would, in fact, fully mitigate the project's impacts; (3) submit and receive Commission approval of coastal development permits for the restoration activities at the two sites; and (4) follow up on Caltrans' commitment to further substantiate the unavailability and infeasibility of non-agricultural sites in the Humboldt Bay area.

4. **Sea Level Rise Planning.** Prior to or concurrent with its submittal to the Commission of a coastal development permit application for the project Caltrans will complete its "Climate

Change Adaptation Pilot Strategy for Critically Vulnerable Assets in Northwest California," and the project described in the permit application to be submitted to the Commission will reflect the findings and implications contained in that study, including any necessary redesign to incorporate appropriate sea level rise-related adaptation strategies.

II. APPLICANT'S CONSISTENCY CERTIFICATION

Caltrans has certified that the proposed activity complies with California's approved coastal management program (CCMP) and will be conducted in a manner consistent with such program.

III. FINDINGS AND DECLARATIONS

A. PROJECT DESCRIPTION

Caltrans proposes the construction of the Eureka - Arcata Route 101 Corridor Improvement Project along the east side of Humboldt Bay in Humboldt County, from the Eureka Slough Bridge in Eureka to the 11th St. overcrossing in Arcata (Postmile (PM) 79.9 to 86.3) (Exhibits 1-3, 5-7, & 10-11). Caltrans characterizes Route 101 in the project reach to be "approximately 5 miles of expressway and 1 mile of freeway." The expressway typically carries high volumes of traffic, and combined with the six at-grade intersections, leads to hazardous uncontrolled crossings at the intersections, which is the primary source of safety concerns in the corridor. Two of the six crossings, Mid-City Motor World and Indianola Cutoff, have collision rates higher than the state average for similar facilities (Exhibit 4). The project's primary purpose is to improve safety by eliminating uncontrolled left turn moves at the unsignalized intersections. Caltrans therefore proposes to control or close all six of the crossings on this stretch of Route 101. Caltrans states secondary project purposes include reduction of operational conflicts and delay, and roadway rehabilitation.

Major project features include closing roadway median crossings, constructing an interchange at Indianola Cutoff, replacing the southbound Jacoby Creek Bridge, upgrading the bridge rail on northbound Gannon Slough and Jacoby Creek Bridges, partially signalizing the Route 101/Airport Road intersection, and constructing various roadway improvements such as widening, paving, and restriping (Exhibits 2-3, 5-7, &10). More specifically, the project would include:

Bridge Construction Work at Jacoby Creek and Gannon Slough. At both Jacoby Creek and Gannon Slough, existing pairs of bridges carry Route 101 traffic in both directions. Construction work at northbound Jacoby Creek and Gannon Slough Bridges consists of replacing the bridge rail. Concerning the bridge rail designs, which has been an issue of particular focus by the Commission in recent years, Caltrans has committed that the bridge railings on the bridges will be similar to designs previously approved by the Commission on north coast bridges.

Replacement of the Southbound Jacoby Creek Bridge. The new southbound Route 101 Jacoby Creek Bridge would be approximately 74-feet long and 53.5-feet wide (14.5 feet wider than the current bridge) (Exhibit 10). The additional width would provide improved pedestrian and bicycle passage across this bridge. The new bridge would have about 1,073 sq. ft. of increased surface area compared to the existing bridge. The new bridge would be single span with no piers in the channel (the current bridge is a three-span structure with pier supports within the creek channel).

The new bridge would be erected to the east of the current alignment and serve as a temporary detour bridge. Approximately fourteen 3-ft. diameter cast in place steel shell piles would be oscillated (i.e., no impact pile driving is proposed) into place: seven piles on each side of the bank and three per side of bank for the temporary bridge and four per side of bank for the permanent bridge. The piles would be about 15 feet from the creek - bay mean higher water elevation.

Tide Gate Replacement. Existing tide gates on culverts that extend under the Route 101 roadway minimize inundation of surrounding pasturelands from tidal waters while allowing freshwater to drain. All of the existing tide gates within the project limits (i.e., six locations and a total of nine tide gates) will be replaced (Exhibit 11). The existing tide gates are the standard top hinged flap gate design, either round or rectangular. At the locations where fish may be present, in consultation with the California Department of Fish and Wildlife, National Marine Fisheries Service, and the U.S Fish and Wildlife Service, Caltrans proposes that “fish-friendly” tide gates with an auxiliary door will be installed. To enhance fish habitat, a rock weir will be placed downstream of the tide gates at Gannon Slough. The 101 Slough, Brainard Slough, Old Jacoby Creek, and Gannon Slough are locations where both tidewater gobies and salmonids (special status fish) may be present. The gates with auxiliary doors are similar to the existing gates, with the added feature of a small manually adjustable auxiliary door that can remain open at all times. The small auxiliary door allows muted tidal flow in both directions. The ditch that enters Eureka Slough south of Jacobs Avenue and the California Redwood Sawmill ditch have no special status fish present, so these replacement gates will not use the auxiliary door design.

Extension of Existing Acceleration and Deceleration Lanes. Acceleration lanes and deceleration lanes would be extended at Mid-City Motor World, California Redwood (formerly Simpson) Sawmill, Bracut (east side of highway), and Bayside Cutoff. At Cole Avenue, the existing acceleration onto Route 101 would be closed and the existing deceleration lane would be extended. The acceleration/deceleration lanes typically would include 4-ft. wide right side shoulders, except at the Indianola Cutoff, where 8-ft. wide right side shoulders would be provided.

To extend the existing acceleration/deceleration lanes on southbound 101 at the California Redwood Sawmill, roadway widening would require realigning the two southbound Route 101 lanes 8 feet towards the median. The realignment would avoid removing any eucalyptus trees to extend the acceleration and deceleration lanes.

The acceleration and deceleration improvements would require placement of up to 40,000 cubic yards of fill. Construction activities would not occur within Humboldt Bay, the 101 slough on the east side of Route 101, and the ditch between the railroad bed and Route 101 roadway.

Close Median Crossings. All remaining Route 101 median crossings would be closed at the following intersecting roads/driveways: Mid-City Motor World, California Redwood sawmill, Bracut, and Bayside Cutoff (Exhibit 6). Median closures would consist of the removal of asphalt-concrete paving and possibly some excavation and seeding bare slopes with native or cultivated grasses. The closed areas are proposed for wetland creation/mitigation.

Interchange at Indianola Cutoff. At this intersection Caltrans proposes to separate the crossing movements vertically, which would eliminate the primary conflicting paths of vehicles turning left and crossing Route 101. Originally designed with typical 2:1 engineered slopes, to reduce wetland impacts, overall footprint, fill quantities, and cost, Caltrans modified the interchange to be a "compact diamond interchange" (Exhibits 7 & 8) "Compact" refers to the fill slopes being steeper than typical standard slopes, with a maximum slope of 1½:1 (horizontal:vertical), and the median reduced to an all paved 22-feet width within the interchange area. Caltrans also notes that "The revised interchange design does not readily accommodate the addition of lanes in the distant future." The compact design would nevertheless involve placement of 240,000 cubic yards of fill for the interchange. Construction activities would not occur within Humboldt Bay, the 101 slough on the east side of Route 101 and the ditch between the railroad bed and Route 101 roadway. Landscaping is included in the project to visually enhance the interchange.

Half Signal and Intersection work at Route 101 and Jacobs Avenue, Airport Road, and Route 101. A "half signal" would be constructed at the Airport Road Intersection with Route 101. The half signal would operate such that northbound traffic would have signal control to allow for southbound left turns east to Airport Road/Jacobs Avenue, and westbound left turns from Airport Road/Jacobs Avenue to a southbound acceleration lane, while southbound 101 through traffic would not be stopped (Exhibit 5). The Airport Road/Jacobs Avenue intersection would include a slight realignment of Jacobs Avenue to the east (within City of Eureka and County of Humboldt Right of Way), to accommodate a second northbound lane to allow immediate access for northbound traffic to enter Route 101 northbound. Stopping northbound Route 101 traffic with a signal also requires adding a third northbound lane to minimize queue lengths, for shorter signal cycle times, and less potential for diversion to other routes. The third northbound lane would be added toward the median, and would extend from 400 feet south of the Airport Road Intersection to Mid-City Motor World for a total 3-lane segment length of 3,000-feet. This three lane section is required to ensure vehicles have adequate merging distance between the Airport Road and Mid-City Motor World intersections.

The half signal would be configured to minimize delay to Route 101 traffic (in both directions). To maintain a Level of Service (LOS) C for Route 101, greater delays would be added to the left turning movements to and from Airport Road to southbound Route 101. Based on anticipated increases in traffic volumes, the analysis of the half signal indicated that the delay for the turning movements will become excessive. As the signalized intersection exceeds its

capacity based on predicted growth rates, traffic flow would be maintained by using right turns to and from Airport Road and disabling the signal controlling the westbound move from Airport Road to southbound 101; if this occurred, westbound traffic from Airport Road needing to access southbound Route 101 would first need to turn right and proceed northbound on Route 101 and turn around at the proposed grade separation at Route 101 and Indianola Cutoff.

The right turn move from northbound Route 101 to Airport Road and onto Jacobs Avenue is presently not adequate for truck turning without using both lanes of Jacobs Avenue. Jacobs Avenue needs to be widened to the east to prevent interference from these vehicles with queued vehicles on Jacobs Avenue waiting to turn left onto southbound Route 101. To avoid encroaching into the adjacent private property due to elevation differences, a retaining wall up to 4-feet high, 150-feet long, would be constructed along the edge of Jacobs Avenue. An existing 150-feet long by 4-feet wide roadside drainage would be realigned to modify the current drainage through a culvert (approximately 50 feet long) under Jacobs Avenue. The remaining 100 feet of the drainage is an open ditch along the Airport Road shoulder, which would be eliminated and realigned into a 130-feet long, 24-inch diameter culvert.[1]

Clear Recovery Zone. Twenty to forty mature Monterey cypress (*Cupressus macrocarpa*) and Monterey pine (*Pinus radiata*) trees would be removed that are currently too close to the edge of the Route 101 traveled way. Large trees can pose potential hazards for errant vehicles or vehicles making emergency maneuvers. Removing or shielding fixed objects that are within 30 feet from the edge of the traveled way, known as the clear recovery zone, would enhance safety.

Traffic Management During Construction. How traffic flow will be maintained during bridge relocation and other construction will be addressed through preparation of a comprehensive transportation management plan (TMP) to maintain flows during the three-year construction period in a manner minimizing disruption to travelers, business owners, customers and residents. The TMP would include limiting long-term lane closures; minimizing peak travel period disruption, keeping open local streets and private driveways, use of changeable message signs and media notifications, prohibiting any road work on holidays (such as the 4th of July or Labor Day weekend) or when special events are scheduled, maintenance of bicycles access through the work zone (including maintenance of a clean shoulder that is safely passable by bicyclists), and maintaining the existing speed limit on Route 101 to avoid diverting traffic to State Route 255 or Old Arcata Road.

Construction is expected to occur over an approximately three year period, beginning in 2015. Caltrans estimates the project cost to be approximately $46 million.

B. BACKGROUND

Historically, the currently uncontrolled intersections have led to safety problems. In May 2002, due to the increasing frequency of injury and fatal collisions, Caltrans formally established the Eureka – Arcata "Safety Corridor," which it considered to be an interim solution/safety

[1] Note: the two paragraphs preceding this footnote represent a clarification to the project description in the consistency certification made by Caltrans in an April 18, 2012, email from Mitch Higa (Caltrans) to Mark Delaplaine (CCC).

enhancement to reduce the hazards. This Safety Corridor included a doubled fine for speeding violations, reducing speed limits (from 60-mph to 50-mph), warning signs, actual speed traveled signs, headlights-on requirements, and flashing light warnings at intersections.

While lowering the speed limit for the three year period the Safety Corridor was in place did not eliminate the potential for severe collisions at the at-grade crossings, the Safety Corridor successfully improved driver behavior and awareness. During its first year, the Safety Corridor resulted in 45% fewer collisions, including 80% fewer collisions at intersections. The legislation authorizing the double fine zone expired after several years (on January 1, 2006), and Caltrans maintains that safety corridors are generally considered ineffective as permanent solutions, because driver reversion to former behavior and future growth lead to reduced effectiveness over time. The DEIR/S (p. 15) notes about safety corridors in general:

> *Moreover, a review of safety corridors on other highways within the State has shown that their effectiveness is short lived. Among the explanations for this loss of effectiveness given by traffic safety engineers is the phenomenon of habituation. It explains why warning signs, which rely upon driver alertness and attentiveness, are not long-term meaningful substitutes for permanent roadway geometric (configuration of roadway elements) improvements engineered using the latest design standards. After an initial enhanced enforcement period (ranging one to three years), the collision rates in these 29 safety corridors approached the pre-safety corridor implementation collision rates. Despite the Safety Corridor, traffic volumes are predicted to increase over time resulting in an increase in traffic collisions even if the reduced speed limit remains in effect.*

Specifically for this Corridor, Caltrans states:

> *Prior to the Safety Corridor, the collision rate five-year averages were higher than the statewide average (for similar highway intersections) at four of the six intersections. After implementation of the Safety Corridor, collision rate five-year averages at Mid-City Motor World and Indianola Cutoff remain above statewide averages; in fact, the collision frequency at Mid-City Motor World and Indianola Cutoff are actually higher than prior to the Safety Corridor.*

Exhibit 4 shows pre- and post-Safety Corridor accident statistics, both for accidents in general and severe accidents/fatalities, and compares them to statewide averages. It should be noted that although the total *number* of collisions was greater at two of the six intersections after the Safety Corridor was in place (Exhibit 4, Figure 2-2), the *severe* collision rates (Exhibit 4, Figure 2-3), show that while the severe collision rates are still well above the state average for two of the intersections (Mid-City Motor and Indianola), at all the intersections the rates declined compared to the pre-Safety Corridor rates (and for 4 of the 6 intersections the declines were significant).

In June 2007 Caltrans circulated a Draft Environmental Impact Statement/Environmental Impact Report (DEIR/S) for the project. The 2007 DEIR/S focused on four alternatives: three Build alternatives (numbered Alternatives 1, 2 & 3), and a No-Build Alternative. These are described more fully below.

Working with a number of local, state, and federal agencies and local interest groups, Caltrans refined its alternatives analysis, and after receiving public comments on the Draft EIR/S, Caltrans modified two of the build alternatives to address concerns from local governments, public agencies, and individuals (Alternative 1A and 3A, the second of which would include a modified interchange at Indianola Cutoff and a half signal at Airport Road). After a public meeting in 2008, Caltrans summarized the public's response as follows:

> *About 75% of the written comments received after the meeting did not mention Alternatives 1A or Alternative 3A. Alternative 3A was favored about two-to-one over Alternative 1A; however, many more comments favored the No-Build Alternative or an alternative that would include a bicycle path. Although Alternative 1A would meet the project need and purpose, two common objections to this alternative were the safety concern anticipated by bicyclists using the turnarounds* [i.e., allowing U-turns] *and the turnarounds potentially creating driver confusion. Some commentators objected to the interchange feature of Alternative 3A* [i.e., the fill slopes and vertical separation of lanes].

In June 2009, Caltrans selected Alternative 3A as its preferred alternative (and under U.S. Clean Water Act 404(b)(1) Guidelines, the "preliminary Least Environmentally Damaging Practicable Alternative (LEDPA). In June 2010, and at the request of the Humboldt County Association of Governments (HCAOG) and Jacobs Avenue residents and businesses, Caltrans considered additional modifications to Alternative 3A, resulting in the currently proposed project referred to as "Modified Alternative 3A." The additional modifications were to the turn moves allowed at the Airport Road signal (referred to in this document as a "half signal"), to allow southbound turn moves from Airport Road. While Caltrans has not finalized the EIR/S (and will not until after Commission action on this consistency certification), it nevertheless states:

> *Modified Alternative 3A is currently the proposed LEDPA and Preferred Alternative that meets the project need and purpose of safety improvement (and other long-term highway improvements) that would benefit all travel modes, while minimizing traffic access, visual, and wetland impacts.*

On November 30, 2011, Caltrans submitted a consistency certification to the Commission for the proposed project (CC-054-11). That consistency certification included Caltrans' responses to public comments on the DEIR/S. While the matter was originally scheduled for Commission action at the May 2012 Commission meeting, the Commission staff had communicated a number of Coastal Act concerns raised by the project, and on April 24, 2012, Caltrans withdrew the certification in order to respond more fully to these concerns. On February 8, 2013, Caltrans submitted the subject consistency certification for the project (CC-016-13), which included an addendum responding to Commission staff concerns, which included:

1. Whether the project was necessary to maintain existing traffic capacity, and thus whether it could be considered an allowable use under Section 30233(a) for wetland fill as an incidental public service facility;

2. Whether a "signalized boulevard alternative" would be an environmentally less damaging feasible alternative, in particular to the proposed Indianola Interchange;

3. Whether the project would be growth inducing in a manner inconsistent with the Coastal Act;

4. Whether a feasible visually less damaging, and less landform-altering, alternative to the Indianola Interchange was available (e.g., a signalized intersection);

5. Whether the project could include a guard-rail separated bicycle/pedestrian path along Route 101; and

6. Whether wetland mitigation sites that did not involve conversion of agricultural land to wetland habitat were feasible or available, and even if not, whether adequate wetland mitigation was included in the project.

Caltrans' responses, which will be discussed in more detail in the following sections of this report, include the above-mentioned addendum, as well as a revised wetland restoration concept plan. In these submittals, Caltrans maintained that its proposal would not increase capacity, induce growth, would be less environmentally damaging, and would minimize fuel consumption and greenhouse gas emissions. Caltrans maintained that a signalized boulevard would be less safe and effective, would not result in improved traffic flow, would involve more wetland fill, would be growth inducing, would not minimize fuel consumption and greenhouse gas emissions, would have more adverse visual effects, and would be more problematic for bicyclists and pedestrians. Caltrans also rejected the Commission staff suggestions for a guard-rail separated bicycle/pedestrian path on 101 because it would involve an additional 7.4 acres of wetland fill and would cost $12.3 million, and notes that a Coastal Trail is under consideration on the parallel rail corridor just west of 101.

On June 27, 2013, the Commission staff published its previous recommendation on Caltrans' current consistency certification, previously scheduled for Commission action at the July 2013 Commission meeting. In that report the Commission staff recommended objection and continued to raise concerns over: (1) whether the Indianola Interchange was consistent with the allowable use and alternatives test of Section 30233(a) of the Coastal Act; (2) whether at least an interim bicycle/pedestrian trail needed to be provided along the 101 corridor itself; and (3) whether the wetland mitigation was adequate (and was an appropriate use for former agricultural lands). From ~~Since~~ that time upon until the Commission action on September 12, the Commission staff ~~has~~ continued to discuss and refine the issues with Caltrans staff, and on August 27, 2013, Caltrans provided written responses to the Commission staff's previous recommendation (Exhibit 28). The next section of this report: (1) summarizes other public comments received; (2) summarizes Caltrans' responses to the previous recommendation; and (3) provides Commission responses to the comments.

PUBLIC COMMENTS RECEIVED

The Commission staff has received a large number of letters and email communications providing public comments on the proposed project (Exhibit 29).

The Environmental Protection Information Center (letter, Aug. 14, 2013) states that the project should be more comprehensively integrated into community regional transportation and environmental needs, including consideration of sea level rise, and needs to include a safe coastal trail component (the latter comment being one that is reflected in practically all the communications received [and thus will not be repeated below]), and that less damaging alternatives should be considered (as well as a greater degree of community involvement in the planning).

Ralph Faust (letter, Aug. 16, 2013) urges greater consideration of sea level rise and the need to consider how the Corridor will be protected over time in the face of sea level rise, notes the hurdles facing development of the railroad embankment for use as a coastal trail (which include potential inconsistencies with the wetlands and shoreline structures policies of the Coastal Act's (i.e., Sections 30233(a) and 30253(2)), and indicates the Commission's action should await completion of Caltrans' sea level rise study (discussed in Condition 4 on page 7-8~~6~~ above ~~below~~).

The Humboldt Baykeeper's Aug. 16, 2013 letter states that additional alternatives need to be considered, based on the analysis provided in its traffic consultant's traffic report "Eureka-Arcata Route 101 Corridor Improvement Project Review," Michael Moule, PE, TE and Magnus Barber, Nelson\Nygaard Consulting Associates, August 6, 2013 (Exhibit 27), including continuous Green T intersections (i.e., intersections similar to the "half signal" proposed at Airport Rd.), roundabouts, Michigan lefts, signalization of 2-3 intersections, reducing the number of turning lanes at signalized intersections, maintaining a 50 mph speed limit, and renewing the Safety Corridor legislation enabling doubled traffic fines. Baykeeper also urges more sea level rise planning before committing extensive funds to infrastructure improvements. Baykeeper's Aug. 14, 2013 letter summarizes its traffic consultant's recommendations, stating that the Indianola Interchange would increase highway capacity and traffic speeds, and noting that wetland impacts could be reduced with reduced turning lanes at signalized intersections. Baykeeper's Aug. 11, 2013 letter questions "deferred" mitigation for wetland impacts, raises water quality, night lighting, bicycle safety and other recreational concerns, as well as sea level rise concerns, and states the Indianola Interchange would be growth-inducing and speed up traffic.

Approximately 85 additional commenters raised one or more of the above concerns. Several commenters questioned the safety of the staff's previous recommendation for a guard-rail separated bicycle/pedestrian lane on the highway, and as noted above, most commenters urged completion of planning for a safe permanent coastal pedestrian/bicycle trail.

CALTRANS COMMENTS RECEIVED

On August 27, 2013, Caltrans provided written responses to the Commission staff's previous recommendation, as articulated in its June 27, 2013 staff report (Exhibit 28). In that submittal, Caltrans maintains:

1) The project purpose is to reconfigure and upgrade the current facility to reduce the high fatal and injury accident rates that have plagued the Corridor since Caltrans began studying the issue in 2001, and the project would not have the effect of increasing traffic capacity.
2) The project minimizes wetland fill.
3) The project would maintain as low a visual profile as possible so as to minimally impact coastal views from throughout the Humboldt Bay region.
4) The project would supply new and enhanced opportunities for connecting the public with low-cost recreation resources within the coastal area.
5) The project would not remove any barriers to growth within the coastal area.
6) The project is an allowable use for wetland fill as an incidental public service.
7) The Commission has recently approved similar Caltrans projects involving wetland fill: the Alton Interchange in Humboldt County and the I-5/Genessee Overcrossing in San Diego (CDPs 1-07-038 and 6-11-093, respectively).
8) The staff-recommended signalized intersection at Indianola would "be infeasible," "would fail spectacularly," and "would actually exacerbate the problems that currently exist in the corridor, rendering it *less* safe." [Emphasis in original]
9) The submitted traffic analysis submitted by the Humboldt Baykeeper is "quite rudimentary and deeply flawed," and "Caltrans could not responsibly disregard its own studies in place of the unsubstantiated claims of the Nelson-Nygaard Report, although that is precisely what Commission Staff has done. That report, containing little more than untested conjecture, is not a sound basis for rejecting thirteen years of project development and design."
10) Caltrans is continuing to work cooperatively with the Commission staff concerning wetland mitigation options.
11) The Commission staff misapplied the County's LCP concerning the analysis of views and the scenic character of the area.
12) The project site is not a natural landform; rather it is artificial bay fill.
13) "There are public viewing areas elsewhere around the Bay, and from those positions, the interchange is not particularly visible due to its low profile and the presence of significantly taller trees nearby."
14) The project site "is one of the semi-urban sections [which the Commission staff acknowledges elsewhere in the recommendation], which is not to say that it lacks visual value, but rather that it is a reasonable location for a landscaped interchange."

15) "The parties have recently agreed to mitigate for the [visual impacts of the] interchange further by working with the owner [of the outdoor advertising display west of Indianola and 101], advertiser, and relevant Caltrans organizations to fund the removal of the . . . display [that is] currently blighting this area of the corridor.

16) Caltrans is not legally obligated under the Coastal Act to fund or build a Coastal Trail. Caltrans is nevertheless "committed to preserving and enhancing coastal access and recreational activities where feasible and within the project scope."

17) The project would improve bicycle safety through a number of the features being added, including the Indianola Interchange.

18) "Caltrans is committed to keeping the speed limit at 50 mph within the corridor, insofar as the vehicle code allows."

19) An interim Coastal Trail on 101 itself would undermine efforts to secure the Bay Trail's future.

20) Recent developments disavow the Commission staff assertion that the success of the Bay Trail is speculative. "A recent North Coast Railroad Authority (NCRA) resolution would allow the trail to proceed in the rail right of way under certain conditions, and funding sources are beginning to fall into place."

21) Caltrans will "continue to coordinate and consult with Commission Staff and other interested agencies concerning issues relating to the Coastal Trail in satisfaction of their statutory obligations, but can only expend such efforts in support of the Bay Trail — the more feasible of the options available."

22) The interchange would not be growth-inducing. Overall system capacity would not be expanded, and agricultural lands near the interchange zoned for agriculture lack sewer service, making "development impracticable and the high water table makes it likely to stay that way."

23) If the interchange would be growth inducing, then a signalized intersection would also be growth inducing.

24) Caltrans is "is prepared to explore mechanisms to minimize potential growth pressures or zoning changes as necessary … [such as through] working with the Commission, the County, and the City of Eureka to develop additional and effective mitigation measures through the coastal land use permitting process to assure that development pressures, if realized, do not induce growth around the Indianola interchange. Currently, ideas include creation of easements or imposition of use restrictions to meet these purposes."

25) The Indianola improvements will not lead to growth, but they may provide a lifeline to existing businesses in the area."

26) "Project proponents have worked in good faith with Commission Staff to address their concerns with the Preferred Alternative. The Project proponents accordingly request that the Commission affirms the consistency determination completed by FHWA, allowing the Project to move forward."

COMMISSION ~~STAFF~~ RESPONSES

In response to the public comments above, the Commission agrees with the many commenters who asserted that a trail component needs to be part of or coincide with the Corridor improvements; this recommendation ~~can be found on pages 51 and 54~~ has been incorporated into Condition 1 and the findings in Section III.H below.

The Commission agrees with the comments emphasizing the importance of studying sea level rise in this area, but it does not agree that critical safety improvements to the low lying infrastructure need to await further sea level rise planning. In addition, some aspects of the proposal already take sea level rise (SLR) into account to the extent possible in light of the need for relatively quick action. For example, Caltrans has designed the Jacoby Creek Bridge replacement assuming that the bridge will have a 75 year structural life, and the proposed bridge is designed to accommodate (or to be fairly easily adapted if sea level rise exceeds predictions) a 51 inch sea level rise (SLR) (i.e., within a range of 40 to 55 inches of SLR by the year 2100 (Consistency Certification Appendix D – Greenhouse Gas Analysis and Sea Level Rise Adaptation Discussion). That document concludes (page 13):

> *SLR adaptation measures for Route 101 and/or the railroad bed have not been fully studied. Delaying the project to assess, plan and incorporate SLR considerations for the proposed project would substantially delay a project under environmental review since 2001 and needed to enhance safety for the existing Route 101 corridor between Eureka and Arcata. The proposed project includes improvements within the existing roadway that generally would not complicate nor foreclose opportunities for future SLR adaptation improvements. As previously mentioned, the proposed bridge replacement and grade separation structure will be constructed to withstand medium projected SLR for the next 75 years.*

That document also states that the proposed Indianola Interchange would be elevated above SLR projections, stating (page 12):

> *Route 101 at the proposed grade separation at Indianola Cutoff would be elevated to an approximate elevation of 34 feet, which is over 20 feet above the estimated SLR. The local road connection, Indianola Cutoff would be below the highest anticipated tides based on the potential sea-level rise.*

The Commission appreciates that Caltrans is designing the longer term components to accommodate ~~'s~~ SLR, and undertaking a ~~concern is that it may be premature to authorize the interchange (assuming it were otherwise consistent with the Coastal Act policies) prior to completion of Caltrans' upcoming~~ more focused SLR study for the Corridor area. However, without assurances the two undertakings will continue to be adequate coordinated, the focused

study might become irrelevant. The Commission is therefore adopting Condition 4 to assure that the two efforts will continue to be closely coordinated.~~, because it is not clear whether the base of the interchange will need to be raised (thus reducing vehicle clearance space) to accommodate SLR, and because a new interchange would likely require additional modifications to the roadway, drainage structures, and other ancillary roadway elements. In addition, and other options are available to address the safety concerns at this location on either a permanent or an interim basis. The Commission does not agree that the other project components need to await completion of the more focused study being performed.~~

The Commission understands ~~agrees with~~ the comment that a rail trail would indeed raise issues with respect to the wetland and shoreline structure policies, but notes that, given the Coastal Act's mandate for increased access, these issues may be able to be considered and ultimately likely resolved through the conflict resolution policy of the Coastal Act (Section 30007.5). ~~The analysis below supports the comments that additional alternatives need to be considered. The staff did not intend to imply, and the findings adopted by the Commission should not be construed to mean, that a signal light at Indianola would be the *only* alternative that could be authorized under the Coastal Act.~~

Finally, with respect to many commenters' expression of the need for and superiority of an off-highway coastal trail, the ~~staff~~ Commission agrees~~d~~ and has determined that the project needs to accompanied by the~~modified the recommendation to~~ provision~~de~~ of ~~for~~ such a separate ~~trail if it can be implemented. As such, the Commission's findings herein provide for that alternative possibility. The~~trail. The remainder of the public comments, as well as Caltrans' comments, are addressed in the ~~recommendation~~ findings below.

Concerning the points raised by Caltrans, the Commission agrees with points 1-7, based in part on the inclusion of Caltrans' commitments concerning the Coastal Trail, visual improvements, and exploration of further growth-minimization measures.~~6 do not raise any new issues, beyond what was covered by the staff recommendation issued for the Commission's July, 2013 meeting. Points 1-6 are addressed by the findings below. The prior matters raised in point 7, the Caltrans Alton Interchange south of Fortuna and I-5/Genessee Overcrossing in San Diego, were not similar projects in one critical respect – although both involved wetland fill, the Commission found that they did not increase capacity. The I-5/Genessee project was simply adding lanes to the overcrossing to bring the width up to the number of lanes on the roads leading up to the crossing. An additional difference with the Alton project was that it was located at the intersection of two state highways, which differs significantly from the "boulevard" nature of the 101 Corridor at and near Indianola, which raises different safety implications. In both cases the Commission found the project would not increase capacity, qualified as an incidental public service, and was the least environmentally damaging feasible alternative.~~

On point 8, the Commission ~~dis~~agrees ~~with~~ that Caltrans has provided sufficient information that ~~that~~ a signal light at Indianola would be infeasible and~~or~~ less safe than the proposed interchange at that intersection~~status quo~~, for the reasons discussed in the findings below. On point 9, the staff did not rely on the independent study for its previous recommendation, as it had not yet been prepared, and the Commission notes that Caltrans has pointed out that its own

studies were more comprehensive than the independent study.~~; however, now that it has been prepared and presented, the Commission believes it provides an additional, substantive, evidentiary basis to support the staff's recommendations and concerns.~~ On point 10, the staff agreed and modified the recommendation accordingly concerning wetland mitigation, and the Commission's findings therefore reflect that.

On point 11, the staff previously acknowledged that the LCP was not the standard of review and did, as Caltrans notes, focus on view from (rather than across) 101. The LCP language was simply raised because the staff believed it provided additional support for the scenic values of the area. The findings now adopted by the Commission, below, reflect those understandings. On point 12, the Commission disagrees that the historical fill that contributed to the nature of the current landform renders the entire setting ineligible for the protection afforded by Section 30251; the expansive nature of the setting remains, as does its waterfront location, and the landform's visual appearance as a scenic and natural waterfront plateau is precisely the sort of landform that Section 30251 is designed to protect. On points 13 and 14, the Commission disagrees that the low profile of the interchange would not have high visibility, given the topography of the area, or that the profile it would have would be an insignificant impact on the character of the area, notwithstanding its semi-urban character, but nevertheless finds that the visual impact can be adequately mitigated through agreement to implement the measures discussed in Condition 2. On point 15, the Commission urges Caltrans to continue to work with landowners and other entities to improve the quality of the area.~~, regardless of which alternative is ultimately authorized.~~

On point 16, ~~for the reasons discussed in this report, the Commission believes the Coastal Act does in fact obligate~~ Caltrans has now agreed to significantly assist furtherance of the Coastal Trail, in a manner which allows the Commission to find the project consistent with ~~based on~~ Coastal Act requirements to maximize public access, to protect, encourage, and provide, where feasible, lower cost visitor and recreational facilities, and to mitigate adverse effects. ~~Also to that point, as well as~~On points 17 and 18, the Commission agrees with Caltrans that the interchange design would minimize motor-vehicle/bicycle conflicts at the Indianola Interchange and would offer the safest feasible connection for bicyclists to access a Coastal Trail west of the Corridor. ~~remains concerned over the effects of the increased speed of highway users on bicycle safety, as well as the difficulty, without significantly increased enforcement measures, in controlling vehicular speed limits on the Corridor.~~ On points 19-21, the Commission agrees with Caltrans, and Caltrans' agreement with Condition 1 ~~since the report issued for the July meeting, the staff has expanded the options to acknowledge the preference for an off-highway Rail Trail. These findings therefore now acknowledge that preference and reflect the Commission's position that if it could be secured in a timely manner prior to or concurrent with the Corridor improvements, it w~~could, if the necessary assurances are forthcoming, result in a more effective planning and funding effort and obviate the need for Caltrans to provide a trail on the 101 highway shoulder.

On points 22 -25, the Commission ~~dis~~agrees with Caltrans that given the limited number of lanes being provided, combined with several other factors (the low economic growth in the area, existence of zoning controls, infrastructure constraints, a high water table, and Caltrans' commitment to further explore additional institutional mechanisms to minimize growth potential), the project would not be growth inducing in a manner inconsistent with the Coastal

Act. ~~the first two points and the last point, for the reasons discussed in the recommendation, rendering the third point irrelevant. Even if a signalized intersection were growth-inducing (which the Commission contests), it would be less so than the proposed interchange. And even if growth were limited by limitations in other infrastructure, such as sewer service, Section 30254 still limits expansion of the roads beyond what is necessary to accommodate the needs of existing permitted development.~~

On point 26, the staff confirms that Caltrans has worked diligently and in good faith with the staff on the issues raised by the project.

D. PHASED REVIEW

As has historically occurred for Commission review of Caltrans projects that also require an EIR/EIS, and where federal funding is involved, prior to Federal Highway Administration (FHWA) certification of the Final EIS and signing of the Record of Decision (ROD) for the project, FHWA policy guidance is that Caltrans obtain a Commission consistency concurrence before FHWA will sign the ROD and release federal funding for the project. These reviews do not supplant the need for subsequent coastal development permits (CDPs) by the appropriate jurisdictions. When the Commission conducts these types of "pre-coastal development permit" phase federal consistency reviews, the Commission is reviewing the concept, goals and objectives of the proposed project. At this stage in the review process, the information submitted may not include final project plans or final mitigation and monitoring plans. The Commission needs to determine whether it has sufficient information to find that the project, to the extent the project elements and mitigation measures *have* been described, are generally consistent with the applicable Coastal Act policies, and where details may not have been finalized, to identify the mechanism the Commission will rely on to assure that the final details will be consistent with the Coastal Act. The Commission also generally uses this procedure to indicate to Caltrans what modifications and/or assurances, if any, are needed to enable the project to be found consistent with the Coastal Act.

If (and after) the ROD is signed, Caltrans will complete its design and planning process and apply for any necessary CDPs. In addition, any changes to the project design or mitigation commitments raising Coastal Act policy concerns not previously identified could independently trigger additional federal consistency review under the "reopener" provisions of Section 930.66(b) and/or Section 930.100(b) of the federal consistency regulations (15 CFR Part 930), which provide for re-review, based on "changed circumstances," of federally permitted and federally funded activities in which the Commission has previously concurred (i.e., based on a determination that the project is having coastal zone effects that are substantially different than originally proposed and, as a result, the project is no longer consistent with the applicable coastal management program policies).

For this project, which spans four CDP jurisdictions, CDPs will be needed from the Commission, Humboldt County, and the Cities of Eureka and Arcata. However, Caltrans has indicated that it intends to request consolidating the permit jurisdictions and apply for one coastal development permit from the Commission (based on the provisions of Section 30601.3 of the Coastal Act). If the CDPs are not consolidated in this matter, any local government-issued CDP for components of this project would be appealable to the Commission.

E. OTHER AGENCY APPROVALS
Other Regulatory approval/permits needed include:

U.S. Army Corps of Engineers Section 404 Permit for filling of wetlands/Waters of the U. S., and possibly a Section 10 permit for the construction of any structure in or over any navigable water of the U.S.

U.S. Coast Guard Approval of Bridges under the General Bridge Act of 1946 (33 U.S.C. 525).

Regional Water Quality Control Board "Section 401 Water Quality Certification" and possibly approval of any waste discharge into waters of the state, under the Porter-Cologne Act (Water Code Section 13260).

U.S. Fish and Wildlife Service/National Marine Fisheries Service Section 7 Consultation for incidental take of any federally listed species under the Endangered Species Act. (The Fish and Wildlife Service has issued a "No Jeopardy" opinion, dated November 22, 2010, and the National Marine Fisheries Service, has issued a "May affect, but is not likely to affect" letter, dated January 20, 2010. Both these documents contain additional mitigation to protect "listed species" and "Essential Fish Habitat".)

National Marine Fisheries Service Essential Fish Habitat Consultation under the Magnuson-Stevens Act.

Section 106 Compliance Coordination with the State Historic Preservation Officer (SHPO) under the National Historic Preservation Act for protection of significant archaeological and historical resources. Procedures for dealing with previously unsuspected cultural resources discovered during construction.

California Department of Fish and Wildlife 1602 Streambed Alteration Agreement for activities that would affect a stream, and possibly a California Endangered Species Act (CESA) consistency determination may also be required for effects on Coho salmon.

Humboldt Bay Harbor Recreation and Conservation District permit for bridge construction work at Jacoby Creek and Gannon Slough.

F. WETLANDS
Section 30233(a) of the Coastal Act states, in part:

> *The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(4) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(6) Restoration purposes.

(7) Nature study, aquaculture, or similar resource-dependent activities.

Humboldt Bay is one of California's most important wetland complexes and is the largest bay between Coos Bay, Oregon and the San Francisco Bay. The Bay and its surrounding wetland complexes provide habitat for 316 species of birds, 40 species of mammals, and over 100 species of fish and marine invertebrates, many of which contribute to sport and commercial fisheries, including steelhead, coho and chinook salmon, and Dungeness crab. Despite its current high habitat value, over the past 120 years more than 90% of its wetlands have been diked and filled for agricultural, transportation, and urban uses, and only about 850 acres of salt marsh (out of a historic approximately 9,000 acres) remain.

The Coastal Act recognizes the importance and scarcity of wetlands primarily in Section 30233, which allows only limited types of uses in wetlands and imposes strict alternatives and mitigation tests. According to Caltrans' consistency certification, using the Coastal Act wetlands definition the proposed project would result in 10.3 acres of permanent wetland fill, which it indicates results from: replacement of the southbound Jacoby Creek Bridge; construction of the Indianola interchange; extension of acceleration and deceleration lanes; and construction of a (half) signalized intersection at Airport Road. This fill triggers the 3-part test under Section 30233(a) for projects involving wetland fill: (a) the allowable use test; (b) the alternatives test; and (c) the mitigation test. A project must pass all three tests to be authorized pursuant to Section 30233(a).

Allowable Use

Under the first of these tests, a project must qualify as one of the seven stated uses allowed under Section 30233(a). Caltrans maintains that the project is an allowable use under Section 30233(a)(4), which authorizes wetland fill for "*Incidental public service purposes, including but*

not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines." Caltrans maintains that the project qualifies for this allowable use for the follow reasons:

> *The project is needed for public safety improvement and other roadway improvements that would benefit all travel modes. Expansion of an existing road or bridge is an "incidental public service purpose" allowed under Section 30233(a)(4) when no other alternative exists and the roadway expansion is limited and necessary to maintain existing traffic capacity. Since coastal wetlands occur within the existing Route 101 roadway fill prisms and the median, roadway improvements beyond the existing pavement often result in wetland impacts. Although constructing Modified Alternative 3A* [i.e., the proposed alternative] *would result in wetland impacts, any wetland impacts would be fully compensated off-site. The project would improve coastal access and improve safety for both motorized and non-motorized transit by eliminating uncontrolled left turn moves and constructing an interchange.*
>
> *Even though the project includes extending acceleration and deceleration lanes, as well as a new interchange, these improvements are for safety purposes and would not increase the capacity of the roadway; the overall number of through lanes would remain the same after project construction. No new travel lanes will be added to the Route 101 corridor's length in either the northbound or the southbound directions. The proposed interchange at Indianola Cutoff would create a roadway grade separation between the lower ranked left turn movements to and from Route 101 and mainline Route 101 through traffic at Indianola Cutoff would not add additional lane capacity to the overall Route 101 corridor. While interchanges have a greater intersection capacity than intersections with at-grade minor street stop control, interchanges alone do not increase the through capacity of freeway-expressway segments. The existing two-lane highway capacity on Indianola Cutoff also will not increase with the construction of an interchange.*

In support of these assertions, Caltrans cites several previous Commission approvals of other Caltrans-proposed projects where it believes the Commission relied on a similar analysis in its approval findings. Several of the cases cited by Caltrans as analogous are as follows:

1. CDP 1-07-013, Mad River Bridge Replacement, Route 101 between Arcata and McKinleyville, involving 2 acres of wetland fill, with the relevant Commission finding being:

> *The Commission has in the past determined that the fill for certain highway safety improvement projects that did not increase vehicular capacity was considered to be for an "incidental public service" pursuant to the requirements of Coastal Act Section 30233(a)(4). In reaching such conclusion, the Commission has typically determined that a bridge replacement is a public safety project – and thus is undertaken for a public purpose -- and further, that the project is incidental to "something else as primary." That is, the project is a public safety project incidental to the primary transportation service provided overall by the existing highway. This finding is supported in part on the basis that the subject bridge project is not part of new route or highway expansion.*

2. CDP 1-90-295, Highway 1 widening, realignment and left turn lanes 2 mi. north of Fort Bragg, Mendocino Co., involving 1 acre of wetland fill, with the relevant Commission finding being:

> *In this case, the fill is proposed in conjunction with a project designed to improve a dangerous access to beaches and parks. The highway rebuilding project is a public service. Therefore, the Commission finds that the purpose of the fill is consistent with subsection (5) of Section 30233.* [Note: subsection 30233(a)(5) from 1990 is the same as subsection (a)(4) today]

3. CC-007-95 Route 150 realignment and replacement of two bridges over Rincon Creek, at the Ventura/Santa Barbara Co. line, involving 0.02 acres of wetland fill for slope protection for the bridges, with the relevant Commission finding being:

> *The project is consistent with Coastal Act wetland policies (Section 30233) because it: is an allowable use as an incidental public service, because it is consistent with the Commission's wetland guidelines allowing fill for highways where no capacity increases are proposed, where it is the least environmentally damaging feasible alternative, and where adequate mitigation is provided.*

4. CC-074-05 Highway 1 Ten Mile River Bridge replacement, north of Fort Bragg, Mendocino Co., involving primarily temporary wetland effects but also 113. sq. ft. of permanent wetland fill, with the relevant Commission finding being:

> *Construction and demolition activities for the project will occur in the river and within and adjacent to freshwater and brackish water wetlands found along the south bank of the river. The project includes new fill of coastal waters and is an allowable use under the "incidental public service" provision of Section 30233(a)(5)* [now (4)] *as the project is a limited expansion of an existing transportation facility necessary to maintain existing capacity.*

~~The Commission believes that these cases cited by Caltrans are not comparable in that they involved the minimum amount of fill necessary to improve safety without increasing capacity.~~ The above~~se~~ cases all involved assessments of whether the proposed projects were for incidental public service purposes pursuant to section 30233(a)(4) and the Commission's 1981 statewide interpretive guidelines ("Statewide Interpretive Guidelines for Wetlands and Other Wet Environmentally Sensitive Habitat Areas" (hereinafter, the "Guidelines")). The Guidelines analyze the allowable uses in wetlands under Section 30233 including the provision regarding "incidental public service purposes." The Guidelines state that fill is allowed for:

> *Incidental public service purposes which temporarily impact the resources of the area, which include, but are not limited to, burying cables and pipes, inspection of piers, and maintenance of existing intake and outfall lines (roads do not qualify).*

A footnote (no. 3) to the above-quoted passage further states:

> *When no other alternative exists, and when consistent with the other provision of this section, limited expansion of roadbeds and bridges necessary to maintain existing traffic capacity may be permitted.*

The Court of Appeal concurred with the Commission's interpretation in the Guidelines of the term "incidental public service purposes" as a permissible one. *Bolsa Chica Land Trust et al. v. Superior Court* ("*Bolsa Chica*") (1999) 71 Cal.App.4th 493, 516 ("We agree with these aspects of Commission's guidelines"). In Bolsa Chica, the court held that:

> *… we accept Commission's interpretation of sections 30233 and 30240… In particular we note that under Commission's interpretation, incidental public services are limited to temporary disruptions and do not usually include permanent roadway expansions.*
>
> *Roadway expansions are permitted only when no other alternative exists and the expansion is necessary to maintain existing traffic capacity.*

The key tests to determine whether the proposed Eureka-Arcata 101 Corridor project qualifies as an incidental public service under these historic interpretations, and thus with the above cited cases and applicable findings, are the questions of whether the proposed improvements are "necessary to maintain existing traffic capacity" and whether there is "no other alternative" available that would avoid or reduce wetland impacts. The Commission believes both ~~neither~~ of these tests are ~~is~~ met in this situation.

The Commission agrees with Caltrans that the "operational conflicts" posed by the uncontrolled crossings at the intersections on Route 101 between Eureka and Arcata are indeed safety problems that warrant resolution, that the project would not increase the number of through lanes or the overall capacity on Route 101, and that no reasonable or feasible alternatives are available to resolving the safety conflicts that would avoid wetland fill. ~~although it should be pointed out, as noted on pp. 10-11, that that since the Safety Corridor was installed, the data (Exhibit 4) show declines in *severe* collision rates compared to the pre-Safety Corridor rates, and no fatalities have occurred to date since the Safety Corridor began. In any event, the Commission does not agree with Caltrans that resolving these operational conflicts needs to occur in a manner that maximizes traffic flow, as the interchange proposed at Indianola would do. Because the project involves wetland fill, the resolution must be one that does not increase capacity, and it must represent the minimum amount of fill necessary to maintain *existing* traffic capacity.~~

Caltrans states for safety reasons, it needs to plan and design highways to accommodate an increasingly aging population, and that to accommodate higher future traffic volumes (Caltrans estimates a 30% increase in traffic volumes over the next 20 years), ~~that that~~ intersection Levels of Service (LOS) need to be improved, stating:

> *There is no substantial delay or capacity problem along the mainline (Route 101 through lanes) in the Eureka - Arcata corridor, however, substantial delays associated*

> *with left turn traffic crossing Route 101 currently exist and are expected to deteriorate further if no change is made.*

Caltrans' consistency certification confirms that one of the project purposes is:

> ***Reduce delay at intersections.*** *Reducing traffic delays at intersections along the Route 101 corridor to provide a LOS D or better along the Route 101 mainline and LOS C at Route 101 for signalized intersection moves through the year 2031 is another project purpose.*

~~Through this assumption (i.e., the need to accommodate future traffic increases – a 30% increase over 20 years), Caltrans is defining the concept of maintaining existing traffic capacity to include maintaining a particular level of service, which is a broader interpretation than what the Commission has historically relied on when it has determined whether a project is necessary to maintain *existing* capacity.~~

~~Caltrans characterizes the project as a means of maintaining existing traffic capacity, but its attempt to define the concept of maintaining existing traffic capacity to include maintaining a particular level of service violates both historic practice and, more importantly, a fundamental principle established by the case law. Not only is Caltrans framing a broader interpretation than what the Commission has historically relied on when it has determined whether a project is necessary to maintain *existing* capacity, but the courts have rejected the notion that Section 30233(a) could be interpreted to apply to maintaining Levels of Service. For example of the appellate court decision in the above-cited Bolsa Chica case states (at 71 Cal.App.4th at 517):~~

> ~~*Although we accept Commission's interpretation of sections 30233 and 30240, we do not accept Commission's application of that interpretation to Warner Avenue Pond. In particular we note that under Commission's interpretation, incidental public services are limited to temporary disruptions and do not usually include permanent roadway expansions. Roadway expansions are permitted only when no other alternative exists and the expansion is necessary to maintain existing traffic capacity. As the trust points out, Commission found that the widening of Warner Avenue was needed to accommodate future traffic created by local and regional development in the area. Contrary to Koll's argument, this limited exception cannot be extended by finding that a roadway expansion is permissible when, although it increases the vehicle capacity of a roadway, it is designed to maintain an existing level of traffic service. Such an interpretation of the exception would entirely consume the limitation Commission has put on the incidental public services otherwise permitted by section 30233, subdivision (a)(2) [sic].* [Emphasis added]~~

~~The Commission also notes that Caltrans' growth assumptions have also been questioned by the above-cited traffic consultant study (Moule and Barber) (Exhibit 27), which states (p. 7):~~

> ~~*Since the 1950s until 2004, VMT increased at roughly the same rate(the figure shows this trend from 1987 until 2004). Since 2004, VMT has either grown more slowly or*~~

~~*even dropped from year to year. The changes in growth in VMT call into question any predictions on the future growth in traffic on any corridor, including Route 101.*~~

~~The Commission finds that Caltrans' proposed solution, most particularly at Indianola, is one which has the effect of increasing, rather than maintaining, highway capacity. As noted in the following (Alternatives) discussion below, Caltrans' Route Concept Report adopted in 2002 lists (on page 17) the Corridor Project as amongst a number of "capacity increasing" projects (i.e., project list entitled "2000 STIP Programmed Capacity Increasing Improvements") (Exhibit 20). Also as noted in the discussion below, anecdotal information exists to support a conclusion that the interchange would be growth-inducing (and thus capacity-increasing) in the context of an early 1990s proposal by Walmart Stores Inc. (Walmart), later abandoned, to develop a store near the Indianola Cutoff. Caltrans' response to a traffic study conducted for the proposal stated that "…the Walmart project [which the memo indicates would need at least a signal in the short term and probably an interchange in the long term] could be growth-inducing." (Caltrans Response to TJKM Traffic Study" Re: Walmart at Indianola Road, 1-Hum-101-82.67, April 1, 1993) (Exhibit 19).~~

~~At this time, Caltrans maintains that highway capacity is determined by the number of through lanes, that capacity is not affected by intersection bottlenecks, that the non-signalized intersections are not major impediments to traffic flow, that extending acceleration and deceleration lanes serve only to facilitate merging and diverging traffic (i.e., maintaining existing highway capacity by improving level of service), and that the proposal can be considered limited to safety and operational improvements to existing intersections and rehabilitation improvements which are allowable under the incidental use policy.~~

Caltrans ~~also~~ cites ~~a~~ two relevant Commission decisions, one in southern Humboldt County and the other in San Diego, as supporting its assertion that intersection improvements intended by Caltrans primarily for safety reasons do not necessarily increase capacity. In the first of these, the Alton Interchange (Highway 101/Route 36, south of Fortuna - CDP 1-07-038), the Commission determined an intersection overpass would not increase capacity. In the second of these, ~~(~~although it should be noted that the case cited was not one that involved wetland fill and thus did not turn on the question of whether it was an allowable use under Section 30233(a),~~)~~. ~~The case cited is~~ a ~~2012~~ San Diego ~~Caltrans~~ case involving the addition of an auxiliary lane to the I-5/I-8 and I-5/Sea World Drive intersections, near Sea World, ~~and where~~ the Commission's findings included the following statements (CDP 6-12-060):

(1) The … project would not result in an increase of capacity to the general travel lanes of the freeway.

(2) This auxiliary lane project is proposed to alleviate increased congestion on northbound I-5 due to increased traffic volume within the project limits. This increased traffic demand has resulted in a significant backup along I-5 that often extends onto the I-8 connector ramp and further east along I-8.

(3) The proposed project would not increase the capacity of the freeway segment, but would function to improve safety and reduce congestion within the subject area, and all work will occur within the Caltrans right-of-way.

The Commission further accepts Caltrans' assertion that the~~its~~ proposed improvements, including the ~~improvements would not increase capacity may be a reasonable way to interpret the Corridor intersections *other* than the one at~~ Indianola interchange, would not increase capacity or increase the number of through lanes on both Route 101 and Indianola, and that, in terms of the allowable use question, the project could be considered comparable to the Alton and I-5/I-8//Sea World Dr. intersection improvements cited by Caltrans.~~, and the Commission agrees that the four cases cited above (pp. 22-23) would therefore be comparable to Caltrans' proposed solutions for the other five intersections. However, the solution Caltrans proposes at Indianola goes further than the minimum amount necessary to improve safety and maintain existing capacity at this intersection. The Commission believes that the design for this intersection appears to be based as much on maximizing and improving traffic flow and maintaining Level of Service C (based on present and future projected growth rates), and thus increasing current capacity, as it is to improve safety, unlike the cases Caltrans cited above. The Commission further notes that this design differs significantly from the designs Caltrans proposes for the other Corridor intersections.~~

Evidence in the record includes ~~Support for this position can be found in~~ the above-cited traffic consultant study (Moule and Barber) (Exhibit 27), which states:

> *As noted above, an interchange absolutely increases the capacity for the minor streets. Today, due to high volumes on Highway 101, the capacity for left turns from the minor streets is quickly approaching zero, so it is not surprising that the Caltrans studies reported Level of Service (LOS) F for westbound and eastbound left turns from the side streets and driveways, even those with low volumes of left turning vehicles.* (p. 5): [Underlining to be deleted] ~~[Emphasis added]~~
>
> …
>
> *This letter* [i.e. Caltrans letter to CCC staff, July 25, 2012] *includes the following quote: "The construction of an interchange does not increase the capacity of a highway segment." This is not entirely true. It could arguably be true for through movements, but absolutely not for turning movements. The capacity of the proposed interchange is undoubtedly higher than the capacity of the existing stop-controlled intersection. This is evidenced by the LOS F ratings shown for left turning movements in the traffic studies for the project. The reason that these left turn movements show LOS F isn't necessarily because there are a lot of vehicles turning left, but rather because there are so many vehicles on Highway 101, that there are few gaps for left turning traffic to turn across the traffic stream. Consider that if in theory the volume on 101 increased to a point where there are no gaps in the traffic stream, then the left turn capacity would be zero. With an interchange the left turn capacity isn't affected by the through volume on 101 in the same manner. It is MUCH higher.* (p. 6) [Underlining to be deleted]~~[Underlined emphasis added]~~

However the Commission agrees with Caltrans that, in this situation, it would not be possible in this location to implement needed safety improvements in a manner that would have no effects on turning movements. Given that the design of the intersection is driven primarily by safety needs, combined with the fact that the overall number of lanes is not being increased on Route 101 ~~Based on the above information~~, the Commission concludes ~~finds~~ that the proposed project would not increase ~~the~~ overall highway capacity, ~~at the Indianola Cutoff intersection. In addition, as will be discussed in the following section, the Commission will further find that the project is not the least environmentally damaging feasible alternative, and thus the Commission is unable to find that "no other alternative" (that would not result in increased capacity) is available. The Commission therefore concludes that the project does not~~ qualifies~~y~~ as an incidental public service, and is therefore ~~in~~consistent with the first test of Section 30233(a) as ~~,~~ ~~because it is not limited to improvements~~ *necessary to maintain existing capacity*. ~~and because it is not the only (or least damaging, as discussed in the following section) alternative available to improve the safety problem at this intersection.~~

Alternatives

The currently proposed project is called "Modified Alternative 3A" in the consistency certification and other environmental documents analyzing the project. In its Draft EIR/S, Caltrans focused on four alternatives consisting of:

Alternative 1 - Resurface, restore, and rehabilitate (RRR) with median closures.

Alternative 2 - RRR Project with median closures and interchange at Indianola Cutoff

Alternative 3 - RRR Project With Median Closures and Interchange at Indianola Cutoff and Signalized Intersection at Airport Road

Alternative 7 – No-Build[2]

Alternative 1 would consist of 14 components, with Alternatives 2 and 3 each adding one more major component to these. **Alternative 1** would be to close Route 101 median crossing and construct the following roadway improvements: (1) improve acceleration lanes and deceleration lanes at intersections; (2) close median crossings; (3) install and reset safety and weed barriers; (4) make Route 101/255 improvements; (5) make pavement and striping improvements; (6) replace the southbound Jacoby Creek Bridge; (7) upgrade bridge rail on northbound Jacoby Creek and Gannon Slough Bridges; (8) replace nine existing tide gates; (9) add or replace roadway lighting; (10) protect safety by installing guardrail adjacent to two to three billboards south of Bracut; (11) remove specified large trees within the 30-feet clear recovery zone; and (12) remove Safety Corridor sign from the Eureka Slough Bridge to Gannon Slough.

Alternative 2 would be the same as Alternative 1, with one addition: the construction of an interchange at Route 101 and Indianola Cutoff (i.e., the "Indianola Interchange"). Features of the interchange would include 2,600 ft. long off-ramps, 2,000 ft. long on ramps, elevating Route

[2] The fourth alternative is numbered non-consecutively (as No. 7) in the NEPA document.

101 by 25 ft., constructing separated north and southbound bridges, a 50 ft. median width and a median barrier.

Alternative 3 would be the same as Alternative 2, with one more addition: full signalization of the Route 101/Airport Road intersection, including a southbound left turn pocket (and allowing truck U-turns). Southbound traffic speeds would be reduced for vehicles approaching the intersection. The Airport Rd./Route 101 intersection would be relocated to the north to improve operational efficiency. A lane would be added from the Cole Avenue acceleration lane to the deceleration lane at Mid-City Motor World to maintain traffic flow. To minimize wetland/drainage impacts, a retaining wall would be required for a portion of the lane between Jacobs Avenue and Airport Road.

As noted above, after receiving public comments on the Draft EIR/S, Caltrans considered two additional alternatives involving modifications to the Alternatives 1 and 3, as follows:

Alternative 1A would involve closing the medians with turnarounds at three locations in the corridor and partial signalization (a ”half signal”) at Airport Road. No interchange would be involved.

Alternative 3A would involve reducing the footprint, amount of grading, and extent of wetland fill at the Indianola Interchange, by steepening the engineered slopes (from 2:1 to 1.5:1) and reducing the median width (to 22 ft. wide) at the interchange. This alternative would also include the half signal at Airport Road described in the previous paragraph.

As noted in the Background section of this report, after selecting Alternative 3A as its previously preferred alternative, and with additional public agency and other community input, Caltrans identified **Modified Alternative 3A** as the preferred alternative, which further modified the turn moves allowed at the Airport Road signal.

Schematic diagrams of Alternatives 1, 2, 3, 1A, and Modified 3A are shown in Exhibit 12. The chart in Exhibit 13 compares these, as well as the no build alternative. In its consistency certification, Caltrans rejects the no build alternative, which would essentially mean keeping the non-expired elements of the Safety Corridor (e.g., continuation of a posted 50 mph speed limit and daylight use of headlights, but continued discontinuation of a double fine zone for speeding, enhanced public education, and increased traffic enforcement). Caltrans states this would not adequately address safety needs, in part because two of the intersections are already at double the statewide accident average. Caltrans maintains further that the effectiveness of the safety corridor measures will erode over time, especially as future traffic levels increase.

Caltrans states the other build alternatives it examined (Alternatives 1, 1A, 2, 3, and 3A) would all meet the project’s need and purposes, and that Modified Alternative 3A is the least environmentally damaging feasible alternative.

Concerning Alternative 1, Caltrans acknowledges it would involve less permanent wetland fill than the proposed alternative (7.2 acres for Alternative 1A, versus 10.3 acres for the proposed alternative). However Caltrans maintains that the more extensive wetland fill from the proposed alternative is outweighed by other factors. Caltrans concludes:

Modified Alternative 3A meets the LEDPA criteria because it balances overall benefits with environmental impacts. While Alternatives 1 and 1A have less direct impacts to wetlands, they would have the most potential out-of-direction travel impacts to businesses, bicyclists, and Environmental Justice communities. The benefits and advantages of Modified Alternative 3A include:

- *Would avoid or minimize impacts to Environmental Justice communities compared to Alternatives 1, 1A, and 2;*

- *Would reduce out-of-direction travel, which in turn would reduce air quality impacts, fuel consumption, travel delay and costs, and greenhouse gas production, and costs to businesses;*

- *Would substantially improve the safety of public coastal access by eliminating uncontrolled left turn moves while reducing out-of-direction travel with an interchange and a half signal;*

- *Unlike Alternative 1, Modified Alternative 3A would not increase traffic on Old Arcata Road;*

- *Unlike Alternatives 1, 1A, and 2, Modified Alternative would improve the safety of bicyclists crossing Route 101 at two locations;*

- *Modified Alternative 3A would have less wetland impact than Alternatives 2 and 3 while providing nearly the same access benefits as Alternative 3;*

- *Minimal energy and air impacts from out-of-direction travel compared to Alternatives 1, 1A, and 2.*

Caltrans also states that while the Indianola Interchange would result in adverse visual effects ("a moderately high reduction in visual quality for west bound travelers on Indianola Cutoff"), this effect would be offset because "travelers on Route 101 would have better views of the bay as they travel over Indianola Cutoff."

Concerning the alternative that the Commission staff had previously urged Caltrans to consider on multiple occasions (including in the Commission staff's 2007 DEIR/S comment letter), Caltrans continues to maintain that a "Signalized Boulevard" alternative would not be environmentally less damaging (including because it would involve 50% greater wetland fill acreage) and did not sufficiently meet the project purpose for inclusion in the EIR/S as among the alternatives analyzed in detail. The consistency certification states:

Other Alternatives and Design Options Considered but Dropped From Consideration

> ***Signalize multiple intersections.*** *Caltrans staff performed a brief operational analysis of a "boulevard" facility in the corridor by signalizing all six intersections and extending southbound Route 101 left turn lanes (no additional through lanes). Assuming a year 2011 opening day, this option would result in poor Level of Service (LOS D or below) for all left turn moves and LOS D for northbound through traffic at Indianola Cutoff and Bracut. When modeling for year 2031 volumes the LOS conditions are further degraded for left turn movements and Route 101 through traffic. Because of the resulting degraded LOS, some traffic would likely divert to Old Arcata Road and State Route 255 and thus increase traffic through residential areas. In addition, it is unlikely that Caltrans would receive funding approval from the California Transportation Commission for a project that does not follow the approved Route Concept and would in fact lower the performance of the facility. For more information, see Appendix C for a discussion of the "Boulevard" Concept.*

The consistency certification also included several additional documents to support its conclusions, including:

(1) Appendix C, entitled Signalized "Boulevard" Analysis;

(2) schematics and plans for what such a signalized boulevard might look like;

(3) a Traffic Operational Response to the Commission staff's previous suggestions and recommendations (July 17, 2012, memo from District 1 Traffic Operations Chief Troy Arseneau) (Exhibit 16);

(4) a safety analysis (June 28, 2012, Issue Paper – Safety Analysis of Signalization at Indianola Cutoff/Route 101); and

(5) a chart detailing wetland impacts from a signalized approach (Exhibit 15).

In its consistency certification Caltrans points out that many factors need to be examined before decisions can be made to signalize an intersection, including traffic warrants, engineering and safety analyses, which would need to establish that installing a traffic control signal would improve the overall safety and/or operation of an intersection. Caltrans states:

> *Surrounding land use, traffic volumes, pedestrian volumes, and the number of correctable collisions occurring at the intersection are some of the factors looked at in the warrant analysis process in addition to looking to see if intermittent non-signal improvements have been previously applied prior to considering signalization. Other considerations such as the Route 101 Concept (discussed in Chapter 1), the characteristics of the highway, and the potential impact of signalization to adjacent segments of highway need to be considered before a decision is made to signalize an intersection.*

Caltrans distinguishes Airport Rd., where it is proposing a (half) signal, from Indianola Cutoff, stating that a number of overriding considerations justify placing a signal at Airport Road only, including:

(1) the existence at Airport Rd. of residents and numerous businesses with no secondary access;

(2) its proximity to urbanized Eureka, compared to the remaining intersections;

(3) safety considerations, including the greater ability to warn motorists if only a single signal is installed (Caltrans states: "With numerous signals within this segment of Route 101, there is an expectation that the phenomenon of habituation will leave motorists less aware of a single and specific potential conflict, and reduce the effectiveness of warning systems, and increase the potential for collisions"); and

(4) "Signalizing Route 101 at Airport would not likely remove a constraint to growth at this location compared to signalizing Route 101 at Indianola Cutoff or Bracut: the Airport Road and Jacobs Avenue have less areas of developable potential" (here, and as discussed below, Caltrans maintains that signals at other intersections would be growth inducing).

In consistency certification Appendix C (Signalized "Boulevard" Concept Analysis), Caltrans examined (based on a "brief operational analysis") a "boulevard" facility, which would consist of signalizing all six intersections and extending southbound Route 101 left turn lanes. To paraphrase this analysis, Caltrans maintains that such alternative would not be feasible and would be more environmentally damaging because:

1. Further analysis of site conditions, consistency with the "approved Route Concept," and traffic levels that would be transferred to other roads (Old Arcata Rd., Rte. 255) would be needed before a decision could be made to install a signal.

2. It would provide poor levels of service and would divert traffic to Old Arcata Rd. and State Route 255 as a year-2031-expected 30% traffic increase occurs. Upon immediate implementation traffic would be at LOS D at peak periods, and worsen over time if expected traffic increases occur.

3. It may not be eligible for funding approval from the California Transportation Commission if it would not improve the performance of the facility and does not follow the "approved Route Concept."

4. The Airport Rd. intersection, which is proposed for a half signal, can be treated differently than the more northern intersections because: (a) it is close to the City of Eureka where vehicles will be less likely to be moving at highway speeds, and driver expectations are therefore different; and (b) it would be easier to maintain a less-than-statewide-average rate of collisions if only one intersection is signalized.

5. Drivers are more able to observe warnings at a single intersection than at multiple signalized intersections, as they will habituate to them and warnings will be less effective, leading to more collisions.

6. Signalized intersections will need additional acceleration and deceleration lanes.

7. Installing signals at intersections other than Airport Rd. would be growth inducing "because existing commercial development could be more easily intensified from the opportunity provided by signalized traffic controls."

8. Signalized intersections, with their inherent stop and go traffic, would increase greenhouse gas emissions, air quality impacts, and not be energy-conserving.

9. Signalized intersections would change the semi-rural character to a more urbanized character.

10. It would be difficult to accommodate pedestrians with signalized intersections.

It should be noted at this point that the above comments do not compare (nor did the Commission staff at that time request Caltrans to compare) the proposed project against a single additional signalized intersection at Indianola. The staff sought this latter comparison after receiving Caltrans' calculations that a multiple-signalized alternative would involve 50% more wetland impacts.~~Nor do they either conclusively establish the infeasibility of more than the one proposed signal, or adequately explain why a signal at Indianola would significantly differ from one Airport Rd., given that the distance between the last light in downtown Eureka and the proposed half signal at Airport Rd. (approx. 1.4 mi.) is not significantly shorter than the distance from Airport Rd. to Indianola (approx. 1.9 mi.), in terms of effects on traffic speeds. Also, as discussed below, 1.4 miles itself is sufficient distance for travelers to accelerate to highway speeds.~~ However during the hearing the California Highway Patrol submitted testimony that it has been involved in the corridor design since the initial establishment of the Safety Corridor, and that a signal at Indianola could not provide adequate safety (as could a signal at Airport Rd.). Moreover, Caltrans further testified at the hearing that it had discussed this matter with the CHP and that the two intersections were significantly different due to lower traffic volumes at Airport Rd., the smaller distance between downtown Eureka and Airport Rd., and more constrained highway geometry and less visibility when approaching Airport Rd. from the south, all of which factors justify the differing treatments for the two intersections.

Caltrans also included in its consistency certification an estimate of wetland fill associated with such alternative (Exhibit 15 - chart showing wetland impacts from a signalized approach). In its February 2013 consistency certification addendum, Caltrans estimates that "a signalized alternative would require the filling of approximately 15 acres of wetlands as opposed to the approximate 10.3 acres of wetlands that the Preferred Alternative would remove. This is an impact ratio of about 3 to 2." Caltrans states:

> *A signalized boulevard alternative would require more highway widening due to the need for additional through and turning/acceleration/deceleration lanes to maintain*

> *LOS C performance at the signalized intersections. A signalized boulevard alternative would require four northbound through travel lanes and three southbound through travel lanes. Single left turn lanes would be required at all intersections with dual left turn lanes being required for southbound Route 101 left turning traffic at the Indianola Cutoff intersection.*

Because the Commission staff also requested analysis of an "opening day" signalized alternative (i.e., one not taking into account a need to accommodate projected future traffic growth), Caltrans stated the amount of permanent wetland fill associated with a six-signal signalized alternative would be much closer to the proposed alternative (11 acres for an "opening day" scenario as compared to 10.3 acres for the proposed project), stating:

> *For the signalized boulevard scenario in 2018, three through lanes in both the northbound and southbound directions would be required on Route 101 for LOS C. Based upon this lane requirement, the estimated wetlands impact for the opening day scenario would be 11 acres; however, the wetland impacts for the other alternatives are compared using 20-year design requirements. The wetlands impact for the signalized boulevard scenario is 15 acres for the 20-year design period, due to a fourth through lane being required in the northbound direction.*

The Commission staff responded to this information (letter to Caltrans dated June 4, 2013) by requesting that Caltrans compare the proposed alternative with what the Commission staff would call a "Modified Signalized Alternative," consisting of only providing signals at one intersection (Indianola Cutoff) (aside from the already proposed half signal at Airport Rd.)), elimination of the 4th northbound lane that Caltrans had characterized as would be needed for 20 year projected traffic, and elimination of several turning lanes at Indianola. Caltrans' response (letter dated June 17, 2013) (Exhibit 17) was that such an alternative would entail 7.91 acres of permanent wetland fill, which would be less than the proposed project. However Caltrans also included as an attachment a June 14, 2013, Traffic Operations Memo ("Traffic Analysis of Two Signal Corridor Scenario") (Exhibit 18), which states that:

(1) "signalization [at Indianola] is no longer a practical intersection treatment due to the heavy through and left turn volumes … during peak periods;"

(2) "such an installation would change the nature of the traffic flow through the corridor transforming it from a rural uninterrupted traffic flow environment to an urbanlike interrupted traffic flow environment;"

(3) eliminating the lanes that Commission staff requested analysis of would result in "… traffic flow in all directions … experienc[ing] added and undesirable congestion as the traffic signal timing could not be fully optimized to serve the most traffic per cycle length."

The memo concludes:

> *… signalizing Indianola Cutoff is not a viable option for the Eureka-Arcata Corridor. Due to the high level of traffic volumes present in the corridor, a more advanced*

> *intersection treatment is required to adequately facilitate traffic through the corridor. For this very reason, a signalized alternative at Indianola Cutoff was eliminated from consideration years ago in the project development process.*
>
> *A traffic signal at Indianola Cutoff would immediately introduce added congestion to the U.S. 101 corridor between Eureka and Arcata on opening day even if additional lanes were provided to optimize the intersection's signal performance.*

The memo also notes that:

> *Interchanges do* <u>*not*</u> *require traffic to stop and wait for the next available green time as is the case with signalized intersections. For this reason, additional lanes are usually not needed on four lane (two lanes in each direction) divided highway/expressway/ freeway segments when interchanges are added, unless traffic volume and weaving movement levels on the mainline require it to alleviate congestion.* [Emphasis in original]

~~The Commission questions a number of Caltrans' underlying assumptions and believes Caltrans has artificially constrained the number of alternatives it considers feasible and available to those that would maximize smooth traffic flow, at the expense of coastal resource protection needs and Coastal Act legal requirements.~~

~~The Commission disagrees with Caltrans statements that signals would be growth inducing, whereas the proposed intersections would not. Caltrans appears to base this assertion on a purported effect that drivers stopped at lights would be more aware of, and could more easily make turn movements to access, adjacent businesses. If these factors lead to growth inducement, then such an argument would have to be extended to the proposed Indianola Interchange, where Caltrans is proposing to facilitate turn movements and increase visibility to drivers of any surrounding development.~~

~~As discussed in the previous ("Allowable Use") discussion, at least anecdotal evidence exists to support a contention that an interchange would be growth-inducing (Caltrans Response to TJKM Traffic Study" Re: Walmart at Indianola Road, April 1, 1993 (Exhibit 19)). That memo also appears to pose (at that time) that a signal could be a reasonable short- to mid-term alternative (for up to 8 to 9 years, which the Commission would argue further supports its feasibility, as well as it continued consideration). At the same time it should be acknowledged that the memo also expresses Caltrans' fairly strong institutional resistance to signals as inconsistent with its route concept and possibly unpopular locally.~~

~~The Commission questions Caltrans' statement that installing signals *other* than at Airport Rd. would conflict with a "rural uninterrupted traffic flow environment." The Commission believes this ignores the reality that the 101 corridor between the two cities is both semi-urban and semi-rural environment. The Corridor is a relatively short stretch of highway between two cities, is physically within the City limits of the City of Eureka, and businesses do and will continue to exist adjacent to the Corridor. Due to its proximity to Eureka, any time delays during commute~~

~~periods that additional signals would pose would be minimal compared to the delays encountered once commuters reach the downtown area, with its numerous signalized intersections on Route 101.~~

~~The Commission also questions Caltrans' statement that Airport Rd.'s proximity to Eureka means vehicles would be less likely to be travelling at highway speeds. Airport Rd. is over a mile (approximately 1.4 mi.) from the last in a series of traffic lights in Eureka, and after the existing last light drivers are likely to reach highway speeds quickly when existing the City to the north. In any event, the Commission has not been provided evidence to support Caltrans' assertion that vehicles would not already be up to highway speeds within this distance.~~

~~Further support for the Commission's alternatives analysis can be found in the previously-cited Moule and Barber traffic study (Exhibit 27), which states that: (1) the proposed interchange would be growth-inducing (as discussed above); (2) Caltrans may be exaggerating future growth projections; (3) one or more additional signalized intersections (at Indianola, and possibly at Bayside Cutoff) would be feasible and could be designed to reduce wetland impacts; and (4) additional alternative intersection designs at Indianola may be feasible (such as a continuous Green T intersection (which is another term for what Caltrans has been calling the "half signal" proposed at Airport Rd.), a roundabout, and several other configurations. This study also points out the currently low use of the intersection by pedestrians such that this factor is likely not a significant determinant in alternatives selection (although it notes that any alternative could be refined to improve the safety of pedestrian and bicycle crossings).~~

The Commission agrees with ~~acknowledges~~ Caltrans ~~' argument~~ that a signal would increase fuel consumption and greenhouse gas emissions, as well as electricity use for signals, compared to the proposed interchange. ~~However the Commission finds these effects to be relatively minor and outweighed by the proposed interchange's other adverse effects described in this section.~~

The Commission also ~~questions~~ agrees with Caltrans~~'~~ assertion, which is backed by collision data (Exhibit 17, p. 3), that the proposed interchange would be significantly safer than either the no project alternative or a signalized intersection at Indianola.~~s within the corridor would be inherently unsafe. The Commission believes that a safety conflict at an unsignalized intersection could only be *improved* by the installation of a signal, and if only one more signal (at Indianola) is added (to the proposed half signal at Airport Rd.), sufficient warning signs and other devices could be provided to alert drivers to any hazard, and thus avoid the habituation/inattentiveness to and ignoring of warnings/signals Caltrans maintains would occur if all the intersections were signalized. The previously-cited Moule and Barber study points out (p. 9) that:~~

> ~~*The northernmost signal and possibly other signals would potentially experience higher than normal red light running incidents. This can be mitigated somewhat by installing warning signs with flashing beacons or changeable message signs, both treatments previously used by Caltrans in similar situations.*~~

~~The predominant safety problem for the corridor is driver uncertainty as to when to make a safe turn at unsignalized intersections. Both median closing and installing signals would significantly reduce such driver uncertainty. In addition, providing for slower rather than faster traffic, if that is indeed the consequence of signal installation approach, may actually improve bicycle safety and the compatibility of the Corridor for bicycle use.~~

~~Moreover, the effect of constructing the proposed raised fill slopes at Indianola would be far more irrevocable, would involve significant alteration of natural landforms, would involve more significant adverse visual effects in a scenic area, and may be premature, in that it may prejudice future planning options being considered in Caltrans "Climate Change Adaptation Pilot Strategy for Critically Vulnerable Assets in Northwest California." This pilot study being undertaken by Caltrans is intended to focus on the vulnerability of four areas of particular concern, one of which is the project area between Eureka and Arcata. Caltrans indicates (June 17, 2013 letter to CCC staff) the study will not be complete until December 2014, and states:~~

> ~~*While [Caltrans] staff cannot predict what the study's short or long-term recommended actions will be, it may be possible that short term recommendations could be incorporated into the project. It is unlikely that the long-term recommendations would be incorporated into the project.*~~

~~Despite the uncertainties as to the likely study results and ramifications, the Commission notes that installing a signal at Indianola would be less likely to conflict with (and easier to modify to harmonize with) any study outcomes for addressing sea level rise. With a raised interchange the roadway below the overpasses would be fixed at a low level relative to sea level, and it would bemuch more difficult to raise the roadway elevation and maintain sufficient clearances given the presence of the overpass above. Sea level rise implications may necessitate additional modifications to the roadway, drainage structures, and other ancillary roadway elements. While Caltrans has designed the proposed bridge replacement in the Corridor to accommodate sea level rise to the year 2100, because the remainder of the roadbed is maintained on a far more frequent basis (several years, versus a structural life for bridges of 75 years), Caltrans has not proposed, and the Commission staff has not requested, that the remainder of the existing roadbed be designed to withstand future sea level rise. However as mentioned previously (pp. 16-17 above), it is not clear whether the interchange has been designed to withstand future sea level rise.~~

~~The Commission also notes that Caltrans has not provided evidence to support its statement that the California Transportation Commission might not be willing to fund a signalized intersection approach.~~

In comparing the *extent* of permanent wetland fill alone from the various alternatives, the proposed project would involve 10.3 acres of permanent wetland fill. Caltrans' Table S-1 in its consistency certification (Exhibit 13) compares the alternatives as follows:

Alternative 1	3.7 acres
Alternative 1A	7.2 acres
Alternative 2	12.5 acres

Alternative 3	15.1 acres
Modified Alternative 3A	10.3 acres (the proposed alternative)
No-Build Alternative	0 acres

As noted earlier, in response to the Commission staff's request to consider signalized alternatives, Caltrans subsequently estimated: (1) a "full-buildout" signalized alternative (signals at each intersection, and extra through and turning lanes) to entail **15 acres** of permanent wetland fill; (2) an "opening day" signalized alternative (signals at each intersection, and the minimum number of through and turning lanes) to entail **11 acres** of permanent wetland fill; and (3) a "modified signalized" alternative (additional signal only at Indianola, with fewer turning lanes at Indianola than shown in the "full-buildout" plan for that intersection) to entail **7.91 acres** of permanent wetland fill. Caltrans has made a compelling case that the second and third of these alternatives (i.e., the numbered items in the previous sentence) would result in unacceptable traffic congestion and safety conditions, and in any event both the first and second of these alternatives would not reduce wetland fill acreage compared to the proposed project.

The previously-cited Moule and Barber study (Exhibit 27, p. 10-11) examined various combinations of turning lanes at Indianola and indicates that the smaller rather than the larger numbers of turning lanes should adequate for operational efficiency at current traffic levels, and that:

> ***Wetland Encroachment***
>
> *The discussion of travel lanes above addresses minimizing the highway's footprint in this area. Based on our analysis, the existing traffic can be handled with two through lanes northbound, two through lanes southbound, one southbound left turn lane, one northbound right turn lane, two westbound approach lanes (one for right turns and one for left turns, and one eastbound departure lane. This is a total of 13 approach and departure lanes at the intersection, compared to the total of 23 approach and departure lanes shown in the drawing from Caltrans. This is a significant reduction in the highway's footprint.*
>
> *If three through lanes for northbound and southbound traffic are used in an effort to maintain the existing through capacity, then the total number of lanes would be 17 lanes.*

~~Having found in the previous section of this report that a signal at Indianola would not increase capacity (a necessary determinant to finding consistency with the incidental public service test of Section 30233(a)), and if~~ The Commission agrees with Caltrans that closing the median at Indianola is not a feasible alternative, as it would not fulfill the basic project purpose to improve ~~reasonable option, the~~safety. The question for the Commission from a wetland acreage impact perspective then becomes: What improved intersection design would minimize wetland fill acreage while still providing for adequate public safety? Of the three signalized alternatives the Commission staff requested Caltrans to look at (listed on the first full paragraph on this page), the only one with reduced wetland fill acreage would be the "opening day" scenario with a minimum number of turning lanes. Caltrans has provided expert testimony that such an alternative would lead to unacceptable traffic backups, with an average of up to one half mile backup during peak PM conditions (northbound), and with a maximum travel backup of up to

120 vehicles (or 3,000 feet). Caltrans has also provided its Safety Officer estimates that the interchange would reduce collisions by 45% compared to a signal at Indianola, and stated that a signal would fail to adequately protect bicyclists and pedestrians. In addition, the CHP has also testified that a signalized alternative would be inherently unsafe. ~~at least two would entail less than or roughly equal wetland acreage to the proposed interchange. Either of these could be considered less environmentally damaging feasible alternatives to the proposed project, and design refinements may be possible to further reduce wetland effects (such as using some of the lower quality median wetlands rather than the surrounding wetlands just east and west of 101 for turning lanes).~~

Finally, in looking at alternatives, the Commission needs to determine whether additional modifications could further reduce the project's impacts. In order to find the project consistent with the Coastal Act's wetland mitigation, public access and recreation, and view protection policies, as discussed in the remaining sections of this report below, the Commission is conditioning its concurrence on the Caltrans' agreement to further reduce wetland, access, and visual impacts, as well as to incorporate sea level rise planning into continued project planning. ~~In conclusion,~~ The Commission finds that if the project is modified in accordance with the Commission's conditions, the Commission can agree with Caltrans and find~~s~~ that ~~-~~the project would represent ~~Caltrans has not proposed~~ the least environmentally damaging feasible alternative for the Indianola intersection, along with the remaining intersections and other project components proposed. ~~The 240,000 cu. yds. of grading and 25 ft. height of the proposed interchange fill slopes would significantly alter natural landforms, degrade scenic public views and alter the scenic character of the area, and possibly prejudice sea level rise planning options. The Indianola interchange would also most likely be growth inducing, and regardless, as noted in the previous section of this report, it would increase capacity and not be able to be found consistent with the allowable use test of Section 30233(a). As discussed above, a signalized intersection would avoid or reduce many of these impacts; it would involve fewer or comparable wetland impacts, fewer visual impacts, would be more compatible with the character of the area than the proposed project, would raise fewer growth-related concerns, and could be found consistent with the incidental public service test of Section 30233(a).~~ The Commission therefore concludes that, as conditioned, the proposed project ~~is~~ would be~~not~~ the least environmentally damaging feasible alternative and would be~~is therefore in~~ consistent with the alternatives test of Section 30233(a) of the Coastal Act.

Mitigation

Temporary wetland impacts (approximately 4.5 acres for the proposed project) would be restored on site. To mitigate the project's permanent wetland impacts, Caltrans' consistency certification states that only limited areas on-site (i.e., within the right-of-way) are available for mitigation, and that for both quantity and quality reasons Caltrans needs to provide offsite mitigation. Caltrans states the off-site wetland mitigation proposal would consist of restoring, enhancing, and preserving tidal wetland "with high value and function to compensate for impacts to wetlands with relatively low value and function within the roadway setting." Caltrans coordinated with a number of public resource agencies, land trusts, restoration professionals, and private landowners in developing its mitigation plan and in its attempts to identify appropriate sites within the Humboldt Bay watershed and the coastal zone.

Caltrans has submitted two Conceptual Mitigation/Restoration Plans (a Conceptual Wetland Mitigation Plans dated April 2011, and a Draft Restoration Plan dated January 2013). The plans provide for wetland enhancement and/or restoration at the following two sites (shown on Exhibit 21).

The **Demello South** site is a 78 acre parcel west of Arcata and adjacent to the Mad River Slough and the U.S. Fish and Wildlife Service (USFWS) Humboldt Bay National Wildlife Refuge's Lanphere and Ma-le'l Dunes Units. The parcel is zoned Agricultural Exclusive within a combining zone for archeological resource area, beach and dune, flood hazard and transitional agricultural lands.

The **Old Samoa Parcel** site is a 38.3 acre parcel south of Arcata and adjacent to the Dept. of Fish and Game (CDFG) Mad River Slough Wildlife Area, as well as the City of Arcata's Marsh and Wildlife Sanctuary. The parcel is zoned Agricultural Exclusive within a combining zone for flood hazard and transitional agricultural lands.

Caltrans owns both sites, which are adjacent to wildlife reserves near Arcata, and are predominantly diked and drained former tidelands, and include wetlands and non-prime agricultural soils. The Concept Plans indicate that 84 acres of wetland restoration could occur on the two sites, with an additional 4 acres of upland buffer. The Plans are conceptual at this point, and propose a range of possible mitigation strategies at these two sites, including: (1) freshwater wetland expansion; (2) muted tidal restoration of salt marsh habitat; or (3) full-tidal salt marsh restoration.

Historically, in reviewing Caltrans mitigation plans at the consistency review stage, as is the case here, when subsequent coastal development permitting (or where applicable, further federal consistency review) can refine and further develop mitigation proposals, the Commission attempts to ascertain whether (and/or the degree to which) concept or draft plans are likely to be implemented in a manner consistent with past Commission actions and fundamental Coastal Act policy goals, and whether they provide sufficient specificity at this stage of the review process and are likely to be able to provide sufficient acreage and appropriate habitat types to mitigate a project's impacts. (In other words, the Commission's review, like the plans, are conceptual at this stage.)

In numerous discussions and meetings with Caltrans, the Commission staff raised several fundamental concerns over the proposed mitigation proposals, primarily: (1) the conversion of agricultural land; (2) whether the restoration included adequate wetland "creation" or "substantial restoration," as opposed to merely "enhancement;" (3) the adequacy of the mitigation ratio; and (4) the types of habitat being created or enhanced. The most recent written iterations of the Commission staff/Caltrans communications can be found in Caltrans' memo entitled "Response to CC-016-13, Staff Report Comments on Draft Wetland Mitigation/Restoration Plan," which summarizes the Commission staff's concerns and responds point by point (Exhibit 22). However it should also be noted that continuing dialogues have been ongoing, as will be reflected at the end of this section.

The **first** of the Commission staff's concerns was that the mitigation plans would convert agricultural lands to wetlands, which the Commission had not previously authorized in the Humboldt Bay area unless the conversion was a pure restoration proposal, rather than mitigation for a project's wetland fill impacts. The former can be accomplished using the conflict resolution policy of the Coastal Act, whereas it is much more difficult to accomplish when the restoration is intended as mitigation, in part because, among other things, it would be necessary to establish that no non-agricultural lands are feasible or available for mitigation (i.e., whether the effect on agriculture can be avoided and thus not raise a conflict at all between Coastal Act policies).

Caltrans has responded to this historic policy concern partially by designing a restoration project as a "stand-alone" project, which may apply to one or more additional projects, and which would be the subject of a separate coastal development permit before the Commission. Caltrans also maintains that it has been unable to find suitable and available non-agricultural sites, has provided a list of sites it has considered (Exhibit 25), and concludes that "Within the Humboldt Bay area, no feasible non-agricultural lands are available for the development of mitigation (restoration) to compensate for impacts to wetland habitat" (Exhibit 22).

Concerning past Commission actions, the Commission staff indicated to Caltrans that the Commission has not, to date, allowed conversion of agricultural lands to be used for wetland mitigation in the Humboldt Bay area. Relevant past Commission actions include the Commission's review of Caltrans' Mad River Bridges coastal development permit (1-07-013), where Caltrans also proposed wetland mitigation at the same "Old Samoa" site being proposed here. In reviewing that permit the Commission found:

> *Caltrans now proposes, in light of the revised delineation, to undertake riparian wetland mitigation on two acres of the Old Samoa parcel as previously proposed <u>and</u> to undertake an additional 3.4 acres of wetland mitigation at Old Samoa for a total of about 5.4 acres of wetland mitigation at that site. This would raise the total acreage of existing grazed wetland pasturelands at Old Samoa that would be converted to willow and willow-associate species plantings impermissibly <u>and cause a conversion of agricultural lands that would be inconsistent with Coastal Act Section 30242</u>, as discussed below. Although the Old Samoa parcel is not prime agricultural land, this amount of conversion would be significant, and is avoidable. Caltrans could perform the necessary additional riparian wetland mitigation that will be required elsewhere.*
>
> *Coastal Act Section 30242 protects lands suitable for agricultural use that are not prime agricultural lands or agricultural lands on the periphery of urban areas from conversion to non-agricultural use unless continued agricultural use is not feasible, or such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. In the case of the Old Samoa parcel, cattle grazing (though limited by seasonal inundation and general pasture quality) has been the primary use of the subject site for decades, and would likely continue. Bottomland pastures are considered relatively nutritious compared to upland pastures. <u>Caltrans delineated the parcel as nearly 100% wetlands and alternative development options</u>*

> *appear to be severely constrained. Thus, continued agricultural use appears to be feasible, and conversion of the land to non-agricultural use under Caltrans' proposal for riparian mitigation would not preserve prime agricultural land or concentrate development, which the Coastal Act prescribes as the basis for allowing conversion. For these reasons, the proposed conversion of agricultural lands at the Old Samoa parcel would not be consistent with the requirements of Coastal Act Section 30242.* [Emphasis added]

The Commission acknowledges that it *has* historically authorized conversion of agricultural land in the Humboldt Bay area for restoration activities alone, under the conflict resolution policy (Section 30007.5 of the Coastal Act) (e.g., in Consistency Determination CD-007-88, U.S. Fish and Wildlife Service, McBride Ranch Acquisition, and CDP 1-06-036 and 1-06-036-A1, City of Arcata Department of Environmental Services – McDaniel Slough Wetland Enhancement Project).

Responding to historic Commission policy concerns (Exhibit 22), Caltrans:

(1) points out the underlying policy goals in the Coastal Act afforded to wetlands and environmentally sensitive habitat (ESHA);

(2) states that the Coastal Act:

> *… provides no legislative authority to regulate agricultural use as a priority over habitat protection and restoration, clearly, preservation of agriculture is not intended to take precedence over the protection and restoration of wetlands and ESHA;*

(3) cites a recent former chief legal counsel letter to the Commission (dated May 2, 2013), including a statement that it would be:

> *… a reasonable assumption under the language of the Coastal Act, and prior CCC interpretation, is that ESHA preservation has higher priority than agriculture. Mr. Faust concludes that it is fair to assume that the ultimate goal of the Coastal Act is the preservation of habitat and all else is subordinate, as consistent with Section 30240 of the Act and years of CCC practice.*

(4) asserts that the Commission staff has given inconsistent direction to applicants on the subject of the conversion of agricultural land to wetland for mitigation purposes;

(5) cites as support for its position the Commission's approval of the McDaniel's Slough Wetland Enhancement Project, which authorized conversion of 90 acres of grazing lands to wetlands adjacent to the Samoa parcel.

The Commission is not disputing the emphasis in the Coastal Act on wetland and sensitive habitat protection, creation, and enhancement. The Commission disagrees with the statement that infers the Coastal Act lacks legislative authority over weighing agricultural and habitat

protection. The legislature has provided for such weighing, as proscribed in the conflict resolution policies (Sections 30007.5 and 30200(b)) of the Coastal Act. One of the principal tenets of the conflict resolution approach is that it can only be invoked if a project creates a true conflict in that there are no feasible alternatives that would achieve the objectives of the project without violating any Chapter 3 policies. Historically, the Commission has approved the conversion of agricultural lands to wetlands only when: (1) proposed as an independent restoration project; (2) the project presents a conflict between Chapter 3 policies and there are no alternatives to avoid the conflict; and (3) the Commission finds that the restoration is, on balance, most protective of significant coastal resources. Thus, if Caltrans can demonstrate that there are no other (non-agricultural) lands available to use for mitigation, the Commission could consider allowing the use of agricultural lands for mitigation purposes under this sort of approach.

On the Commission staff's **second** concern (creation or substantial restoration, versus enhancement), Caltrans quotes several state and national wetland guidance documents (including the Commission's "Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone") and states that wetland creation is "wrought with uncertainty" and that enhancement of degraded habitat and restoration are generally treated as acceptable forms of mitigation. Caltrans concludes:

> *The Caltrans mitigation proposal meets the criterion for an acquisition with a restoration component. Additionally, as conceptually proposed, we hope to open up a more-than-equivalent acreage to tidal action. The proposed mitigation proposal more than fully compensates for projected project related impacts to highly degraded jurisdictional wetland, and in fact may over-compensate*[3]. [footnote, and emphasis in footnote, in original]

On the Commission staff's **third and fourth** concerns, which are whether restored habitat types and acreages are adequate, including a Commission staff-expressed preference for use of the Demello site (as opposed to Samoa) and to tidal restoration (as opposed to muted tidal or freshwater habitat restoration), Caltrans states:

> *In consultation with CCC staff since 2007, Caltrans has proposed to preferentially perform tidal restoration at the site. Any "acknowledgement" of a "likelihood" to instead perform a freshwater restoration, and/or that likely "site-constraints" exist (within the plan dated January 2013) is a mis-wording on Caltrans' part likely resulting from a third repackaging of our mitigation proposal. Our intent is to whole-heartedly pursue tidal restoration at the site. If this does prove to be infeasible, then a muted tidal*

[3] Proposed mitigation likely over-compensates for projected impacts (fill) to approximately ten acres of highly degraded seasonal wetlands within a narrow strip over a distance of many miles. To-be-filled wetlands have been previously affected by multiple factors including: the previous historic conversion from their natural state as a tidally influenced wetland to a freshwater system; their location beside, and between, a four-lane divided roadway; and, their routine mowing for roadway maintenance reasons. These wetlands exhibit extremely low functionality related to the following function/value criteria: production export, wildlife diversity/abundance, aquatic diversity/abundance, uniqueness or heritage value, recreation value, or storm water treatment. In contrast, proposed mitigation will provide for coastal wetlands with extremely high functionality with regard to the same criteria.

> *approach would be pursued; only as a last resort would a freshwater approach be utilized. With regard to feasibility studies, Caltrans has been and continues to seek CCC support for our restoration proposal prior to expending limited funding on hydraulic design studies.* [Emphasis in original]

Concerning Caltrans' points (4) and (5) above, the Commission staff disagrees that it has given inconsistent direction to applicants (the staff would need further evidence to more fully rebut this point). Concerning the McDaniel's Slough project, the Commission points out that the McDaniel Slough project predominantly restored the diked seasonal grazed wetlands to salt marsh, the original condition of the site before dikes were installed in the late 1800s, whereas Caltrans' proposal at Samoa would simply convert diked grazed seasonal wetlands to diked riparian wetlands and would not result in the true restoration of the Samoa site to the tidal marsh that originally existed at the site.

Since the publication of the Commission staff's previous recommendation for this project, Caltrans has continued to refine the mitigation/restoration program to explore historical data on the habitat types historically present in the area, and to explain its rationale for including a mix (or gradient) of habitat types. Caltrans has also provided supplemental information concerning potential alternative sites that would not involve use (or conversion) of agricultural lands for wetland mitigation. In its most recent letter to the Commission staff (dated August 27, 2013) Caltrans notes: (1) that the Commission staff has remained open to the concept that restoration proposals that are truly restoration to historic or near historic conditions could qualify for mitigation of the project's impacts, despite their occurrence on historic agricultural lands; and (2) that an adjacent site to the Samoa parcel may provide the ability to expand the restoration to enable s significant degree of tidal restoration at that site. This letter also notes that the Commission staff requested additional elaboration of its statements concerning the infeasibility or unavailability of non-agricultural sites in the Humboldt Bay area. At the conclusion of the most recent discussions, while the Commission's staff ecologist (Dr. John Dixon) had questioned whether Caltrans' previous proposal for the Samoa Parcel qualified as "restoration," he now states that with the additional potential for significant tidal flow restoration that could be delivered through the adjacent parcel, it could be considered restoration. Dr. Dixon states:

> *Caltrans has proposed that the creation of riparian habitat would be appropriate mitigation for wetland impacts associated with work on Highway 101. Caltrans has presented convincing evidence that riparian habitat was historically present in many areas surrounding Humboldt bay, once occurring between the tidal wetlands and the forested hillsides. The Commission staff agrees conceptually that a mix of significant tidal wetlands with associated riparian habitat farther inland could provide valuable ecosystem services that would appropriately mitigate for highway-related wetland impacts. Existing development limits the location of such a system such that riparian restoration would now have to occur within the historical range of tidal wetlands rather than at higher elevations. The Commission staff believes that this limitation is acceptable, so long as the riparian restoration is integrated with a significant tidal component.*

To conclude, the Commission finds that ~~if the project were able to be brought into consistency (as discussed in the previous sections of this report) with the first two tests of Section 30233(a), in looking at the mitigation issues alone (and it should be noted that any alternative meeting the project purpose will entail some degree of wetland fill),~~ Caltrans is exploring restoration concepts that, given the conceptual nature of this review, enable the Commission at this time to find that they have the potential to meet the wetland mitigation test of Section 30233(a). To fully meet this test, prior to any subsequent Commission review of a coastal development permit for the project, Caltrans would need to: (1) expand the Samoa restoration concept to include true tidal restoration; (2) provide a biological analysis showing that adequate acreages and/or habitat mixes would, in fact fully mitigation the project's impacts; (3) submit and receive Commission approval of coastal development permits for the restoration activities at the two sites; and (4) follow up on Caltrans' commitment to further substantiate its assertions concerning the unavailability and infeasibility of non-agricultural sites in the Humboldt Bay area. The Commission therefore concludes that, if modified in a manner consistent with Condition 3 (Wetland Mitigation), which reflects these measures, ~~With these measures and future Commission reviews, the Commission could find~~ the project could be found consistent with the third test of Section 30233(a).

In conclusion, for the reasons discussed above, the Commission finds that the project will be ~~in~~consistent with the allowable use, ~~and~~ alternatives, and mitigation tests of Section 30233(a) of the Coastal Act, ~~but that~~ if the project ~~were~~ ~~able to be~~ is modified in accordance with Conditions 1-4 (and with future Commission review of the details of these conditions at the coastal development permit stage).~~to be able to meet these first two tests, and with the additional measures discussed in the previous paragraph, it could be found consistent with the mitigation test of Section 30233(a).~~

G. PUBLIC VIEWS

Section 30251 of the Coastal Act states:

> *The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.*

The primary public view protection issue raised by the proposed project is the 25 ft. high, raised highway interchange proposed at Indianola Rd., which would alter the level topography along the bay, thus altering natural landforms (240,000 cu. yds. of grading) and modifying the character of this scenic area. While at this stage of the Commission's review (as a federal consistency matter), Local Coastal Programs (LCPs) are not the legal standard of review, the Commission nevertheless looks to the relevant LCPs for guidance in conducting federal consistency reviews, especially where a local government has adopted scenic designations.

Such designations are particularly relevant when coastal development permits will need to be obtained later (as is the case here - see p. 19).

Humboldt County does not use the term "highly scenic" in its LCP policies; nevertheless it does designate the area a "scenic coastal area" and contains similar standards to those found in Section 30251 of the Coastal Act for coastal development permit reviews, requiring development in this scenic area to be "subordinate to the character of its setting." The County's Land Use Plan (Humboldt Bay Area Plan, Section 3.40-B), provides:

> *3. Coastal Scenic Area*
>
> *In the Coastal Scenic Area designated in the Area Plan Map (Indianola area), it is the intent of these regulations that all developments visible from Highway 101 be subordinate to the character of the designated area, …*
>
> *4. Coastal View Areas*
>
> *In Coastal View Areas as designated in the Area Plan, it is the intent of these regulations that no development shall block coastal views to the detriment of the public; …*
>
> *5. Highway 101 Corridor*
>
> *The Humboldt County Board of Supervisors shall initiate the preparation of a Scenic Route Study pursuant to the adopted Scenic Highways Element of the Humboldt County General Plan for the portion of Highway 101 between Eureka and Arcata and that portion south of Fields Landing, inclusively.*
>
> *The Scenic Route Study shall be prepared by the County Planning Department in cooperation with the California Department of Transportation. The content of the Study is outlined in Appendix E. A special emphasis of the study shall include opportunities for Cal-Trans, the County, and the Humboldt Bay Harbor and Conservation District to eliminate billboarding between Eureka and Arcata, through acquisition and other means, and to identify suitable areas for clustered signing.*
>
> *New off-site signs may be permitted in suitable areas identified in a County and State Coastal Commission approved Scenic Route Study.*

(Unfortunately, while the Land Use Plan (Appendix G) went on to list Caltrans and County responsibilities to be carried forth in the development of the Scenic Route Study described in 3.40-B(5) above, based on recent Commission staff discussions with the County, this study was never carried out.)

The County's LUP maps identify visually significant areas of the County through designations as "coastal scenic areas" and/or "coastal view areas." Route 101 in the Indianola area is designated a coastal view area (CVA) (Exhibit 24,p. 1). Much of the area on both sides of

Indianola Cutoff, between Route 101 and Myrtle Ave./Old Arcata Road is designated a coastal scenic area (CSA) (Exhibit 24, p. 2). (Page 3 of the Exhibit shows both the CVA and CSA.)

The County's LCP Zoning Code requires that coastal development permits in the area not be approved unless the County can make the following findings:

> *312-17.3 SUPPLEMENTAL FINDINGS*
>
> *In addition to the required findings for all permits and variances, the Hearing Officer may approve or conditionally approve an application for a Special Permit, use Permit, Coastal Development Permit, or Planned Unit Development Permit only if the supplemental findings, as applicable, are made. (See Sections 312-18 through 312-49)*
>
> …
>
> *312-39 SUPPLEMENTAL COASTAL RESOURCE PROTECTION IMPACT FINDINGS*
>
> …
>
> *39.3 COASTAL SCENIC AREAS*
>
> *39.3.1 The project is sited and designed to be subordinate to the character of the setting. …*
>
> …
>
> *39.5 COASTAL VIEW AREAS*
>
> *39.5.1 To the maximum extent feasible, the project is sited so as not to interfere with public views to and along the ocean from public roads and recreation areas. …*

In looking at the map designations, while the County LCP policies appear to be focusing more on the views from Highway 101, rather than across Highway 101, this may be because it did not anticipate the raising of portions of Highway 101. The policies are nevertheless indicative of the scenic resources and importance of public views in the area.

While Caltrans' originally proposed interchange described in the DEIR/S involved more grading and landform alteration (Original Alternative 3), for several reasons discussed in the Alternatives section above Caltrans steepened the slopes and reduced the amount of fill. Nevertheless the interchange would still involve placement of 240,000 cu. yds. of fill, and would raise the highway elevation for a distance of up to approximately one half mile by up to 25. ft. Public views to and across the Bay from Indianola Cutoff would be altered and existing large trees would be removed, which would alter scenic views inland from Route 101. Caltrans states in its consistency certification (p. 75) that the proposed project:

> *… consists of various roadway improvements that would not substantially alter the existing roadway; however, there are project elements that could change the existing visual setting:*
>
> > *1. A compact diamond interchange would be constructed at Route 101 and Indianola Cutoff. The interchange was designed with steepened fill slopes to*

> *reduce the overall footprint of the interchange. See Appendix J* [Exhibit 23] *for photograph simulations of the interchange. Landscaping is included in the project to visually enhance the interchange.*
>
> *2. The new southbound Route 101 Jacoby Creek Bridge would be approximately 74-feet long and 53.5-feet wide (about 14.5 feet wider than the current bridge).*
>
> *3. Modified Alternative 3A would require removing up to 54 mature trees within the roadway median and east side of Route 101 during construction. The project includes landscaping of areas disturbed by construction activities with native plants.*

> *Overall, the proposed project would be designed and constructed to be visually compatible with the character of the surrounding area, which consists of a mix of commercial, industrial, and open space lands.*

On page 50 of the same document Caltrans states:

> *The proposed interchange would result in a moderately high reduction in visual quality for west bound travelers on Indianola Cutoff; however, travelers on Route 101 would have better views of the bay as they travel over Indianola Cutoff.*

Caltrans also notes that the replacement trees would be a mixture of Bishop Pines, alders and cypress trees, with a height at maturity of 40-50 ft., that it will make every attempt to avoid tree removal along the entire Route, if such retention can be accomplished in a manner maintaining safe traffic conditions, and finally, that bridge railings designs will be similar to those preferred by the Commission in past Caltrans bridge review projects.

~~The Commission disagrees with Caltrans that the above minimization and mitigation measures bring the project into conformance with Section 30251, or that view blockage would be offset by improved views for interchange travelers. Under Section 30251~~ As originally proposed the Commission ~~needs~~ was not~~to be~~ able to find that the project ~~would not block public views,~~ would minimize alteration of natural landforms and~~, would minimize~~ public view impacts.~~, and be compatible, if not subordinate to, the character of the area.~~ However, at the hearing, Caltrans indicated a willingness to modify the slopes underneath the overpass to increase the width of the view through the interchange, and seriously explore removing one or more billboards along the Corridor, which would serve to offset visual impacts. The Commission finds that if the project is modified in accordance with Condition 2 to significantly expand these efforts, in particular more extensive billboard (and overhead infrastructure) removal, the project could be found ~~is unable to make any of these affirmative findings. Placement of 240,000 cu. yds. in a level area that is barely above sea level, and creation of an approximately half mile long (north to south), up to 25 ft. high, interchange, would block public views to and across the Bay from Indianola Cutoff, and would represent a significant visual intrusion into a scenic area. The Commission further finds that because minimizing visual impacts inherently involves looking at alternatives, based on the discussion in the Alternatives section of this report, alternatives are available that would avoid the need to modify the landforms and topography and the substantial grading~~

~~associated with a raised interchange. For these reasons the Commission finds the proposed Indianola Interchange would not minimize alteration of natural landforms or public view impacts, would not be compatible with the character of the area, and would be in~~consistent with the requirements of Section 30251 of the Coastal Act.

H. PUBLIC ACCESS AND RECREATION

Section 30210 of the Coastal Act provides:

> *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

Section 30213 provides:

> *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred.*

Section 30214 of the Coastal Act provides:

> *(a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following:*
>
> > *(1) Topographic and geologic site characteristics.*
> >
> > *(2) The capacity of the site to sustain use and at what level of intensity.*
> >
> > *(3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses.*
> >
> > *(4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter.*
>
> …
>
> *(c) In carrying out the public access policies of this article, the commission and any other responsible public agency shall consider and encourage the utilization of innovative access management techniques, including, but not limited to, agreements with private organizations which would minimize management costs and encourage the use of volunteer programs.*

The primary Coastal Act policy considerations raised by the proposed project involving public access and recreation opportunities are the effects of the project on, and opportunities available to maximize, public access and recreation along the Route 101 Corridor, in particular non-motorized bicycle and pedestrian opportunities. Bicyclists currently are allowed to, and do, traverse the corridor; however the predominant bicycle use is by commuters.

In recent years the Commission has urged implementation of Coastal Trail segments when opportunities have arisen in its permit, federal consistency, and Local Coastal Program reviews. Providing for the Coastal Trail would contribute to the Commission's ability to find that a project has maximized public access and recreation in a manner required under Section 30210 of the Coastal Act. The Coastal Trail is a vision for all Californians and future generations worldwide that has been endorsed by the legislature and the governor, who have directed state transportation and other agencies to coordinate development of the Coastal Trail, including, where applicable, making lands available for completion of the trail (PRC Section 31408(b), as amended by AB 1396 (2007)).

There appears to be a general consensus that two coastal trails should occur between Arcata and Eureka, one on each side of the Bay, which would converge in downtown Eureka before travelling further south. For the trail along the east side of the bay, the City of Arcata has recently issued planning documents for the Coastal Trail through the City and as far south as Bracut (Arcata Rail with Trail Connectivity). For the Route 101 Corridor itself, much of the discussions of the ideal trail location have involved attempts to determine whether a trail fully separated from the highway, and along the North Coast Rail Authority (NCRA) trackbed paralleling the Route 101 Corridor, could be achieved. Serious questions remain concerning whether such a trail alignment could actually be realized, and the Commission has urged Caltrans to consider implementing at least an interim trail as part of the Route 101 Corridor.

In analyzing the project's impacts, Caltrans contends that the proposed project would not adversely affect public access and recreation and would make the Corridor safer for bicyclists, due to the median closures and other roadway improvements, including restriping to assure consistent 10-foot wide outside shoulders throughout the project. Caltrans also contends that the proposed interchange would provide a much safer crossing of Route 101 compared to the existing uncontrolled at-grade intersection; consistency certification (p. 58) states:

> *The grade separation at Indianola Cutoff is approximately midway between Eureka and Arcata and would provide a convenient means for bicyclists to cross or turn around on Route 101. In addition, the grade separation would provide a much safer crossing of Route 101 compared to the existing uncontrolled at-grade intersection. Finally, the grade separation would provide a safer connection to any potential future bicycle trail on the west side of Route 101 for bicyclists traveling to and from the east side of Route 101 between Eureka and Arcata.*
>
> *… [T]he Preferred Alternative would maintain the existing accessibility for pedestrians, while adding an ability for pedestrians to use the overcrossing at the Indianola Cutoff interchange to cross Route 101 while being "grade-separated" from mainline traffic, a feature that does not currently exist. Thus, the advantage of the grade separation that is*

> *included in Modified Alternative 3A over both the existing*[4] *Route 101 condition and the signalization of all intersections is that both pedestrians and bicyclists could safely cross Route 101 at Indianola Cutoff. Although the construction of Modified Alternative 3A would involve out-of-direction travel for bicyclists needing to turn left or cross Route 101 at locations other than Indianola Cutoff, the enhanced safety of a grade separation at Indianola Cutoff, the approximate midpoint between Eureka and Arcata, would outweigh the out-of-direction travel inconvenience.* [footnote in original]

In its response to Commission staff recommendations that it consider a physically separated bicycle path along Route 101, Caltrans included plans for and a brief analysis of a separated bike trail along 101 (Caltrans Memo, July 24, 2012: Review of Barrier Separated Trail) (Exhibit 26). That memo:

(1) identifies a configuration for an 8 ft. wide bike trail with 2 ft. shoulders and a 2 ft. wide by 3 ft. high concrete separation barrier;

(2) estimates approximately 7.6 acres of permanent wetland fill would be needed for such a trail; and

(3) estimates construction costs of approximately $10.8 million (with unknown costs for any wetland mitigation requirements).

Caltrans' consistency certification February 2013 Addendum refigures the construction cost to be $12.3 million. This addendum also states:

> *The high magnitude of construction cost, permanent wetland impacts, and wetland mitigation would not be feasible for an "interim" coastal trail. However, Caltrans recognizes the importance of completion of the Coastal trail to the Commission, as well as to the public, evidenced by the comments received on the desire for a separate bike and pedestrian path. In addition, at the December 2012 NCRA meeting, the NCRA board took action to approve resolution No. 2012-13 made by the NCRA Humboldt Bay Rail Corridor Committee which included the following:*
>
> - *NCRA will authorize clearly defined and strictly limited exceptions to its current trail policy to enable development of a trail in the Humboldt Bay corridor without compromising the prospects of rail service restoration;*
> - *NCRA will prioritize rail infrastructure restoration and trail development in the Eureka to Arcata corridor to more clearly align its timing and objectives with those of the joint Humboldt County Association of Governments and Caltrans Route 101 Corridor Improvement Project.*

[4] *The Humboldt Bay Area Bike Map*, second edition, 2012, prepared by the Redwood Community Action Agency, lists Indianola Cutoff, Bracut, and Bayside as "difficult" intersections for bicyclists. An explanation of "difficult intersections" is not given, but bicyclists must negotiate four lanes of Route 101 traffic to cross or turn left at these non-signalized intersections.

> *The preferred alternative will make safety and operational improvements at the existing intersections. This includes eliminating potential conflicts for not only motor vehicles but for bicyclists as well.*

The California Coastal Conservancy has published Coastal Trail siting and design standards,[5] which include:

> *1. … Shoreline trail segments that may not be passable at all times should be augmented by inland alternative routes. Special attention should be given to identifying any segments that may need to be incorporated into water-crossing structures and that necessarily must be placed within Caltrans right-of way.*
>
> *2. Where gaps are identified, interim segments should be employed to ensure continuity of the coastal trail. Interim segments should be noted as such, with provisions that as opportunities arise, the trail shall be realigned as close as possible to its optimum location. Interim trail segments should meet as many of the CCT objectives and standards as possible.*
>
> *3. The CCT should be designed and located to minimize impacts to environmentally sensitive habitat areas and prime agriculture lands to the maximum extent feasible. … For situations where impact avoidance is not feasible, appropriate mitigation measures should be identified, including but not limited to use of boardwalks, reducing width of trails, protective fencing and drainage measures along edges of agricultural land, etc.*
>
> ….
>
> *5. The CCT should be designed to avoid being located on roads with motorized vehicle traffic where feasible. In locations where it is not possible to avoid siting the trail along a roadway, the trail should be located off of the pavement and within the public right-of-way, and separated from traffic by a safe distance or by physical barriers that do not obstruct, or detract from, the scenic views and visual character of their surroundings.* [Emphasis added]

The Commission believes these design standards speak directly to the requirements of Section 30214 of the Coastal Act by specifying the manner and balancing considerations that need to be applied in implementing in any Coastal Trail for the area. The Commission disagrees with Caltrans that proposed project itself would not adversely affect access and recreation. The Commission believes the project would adversely affect bicycle use, by cutting off intersections from bicycle access, and requiring out-of-direction bicycle travel for some users of the Route no longer able to turn at medians proposed for closure, and by increasing vehicular traffic speeds along 101, which would increase the potential severity of any collisions with bicyclists.

[5] http://scc.ca.gov/webmaster/pdfs/CCT_Siting_Design.pdf

The Commission believes a Coastal Trail within the 101 Corridor is feasible, but also agrees with Caltrans (as well as many other public commenters) that a rail trail would be a preferable trail, because it could provide much greater safety for pedestrians and bicyclists. The Commission also agrees that construction of both and interim and permanent trails at different times would be inefficient (in terms of expenditure of public funds) and environmentally disruptive (in terms of entailing greater amounts of wetland fill). ~~While the Commission staff has previously raised concerns over the uncertainties of implementing such a rail trail at this time, the Commission also notes that Caltrans has provided recent information (Exhibit 28, Caltrans August 27, 2013 letter) showing greater momentum for such an alternative Coastal Trail.~~ Given the conceptual nature of this review, and ongoing planning being conducted concerning a separate trail, combined with the fact that the Commission has future coastal development permit authority over the project, the Commission concludes at this time ~~that several options exist to mitigate the project's impacts on non-motorized public access, and to enable the Commission to find~~ that the project could be found to ~~will~~ maximize public access, and ~~will~~ to protect, encourage, and provide, where feasible, lower cost visitor and recreational facilities, in a manner consistent with the goals and policies articulated in Sections 30210-30214 of the Coastal Act (as well as other state mandates), if it were modified in accordance with Condition 1, through which ~~. To comply with these policies, the Commission therefore finds that, EITHER the project needs to be modified to include at least an interim Coastal Trail in the form of a separated bicycle/pedestrian pathway along the highway shoulder, OR~~ Caltrans would ~~ill need to~~ commit~~, at this time,~~ that it will establish, to the Commission's satisfaction, no later than at the coastal development permit stage of the Commission's review, that an alternative parallel Class 1 bicycle and separated pedestrian trail nearby (from Arcata to Eureka) will be funded prior to or concurrent with any construction of the 101 Corridor, and that such trail~~it~~ will have the necessary ownership interests or permissions to be allowed to proceed.

I. PUBLIC WORKS

Section 30254 of the Coastal Act states:

> *New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division; provided, however, that it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road. Special districts shall not be formed or expanded except where assessment for, and provision of, the service would not induce new development inconsistent with this division. Where existing or planned public works facilities can accommodate only a limited amount of new development, services to coastal dependent land use, essential public services and basic industries vital to the economic health of the region, state, or nation, public recreation, commercial recreation, and visitor-serving land uses shall not be precluded by other development.*

Section 30250 states, in part:

> *(a) New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have*

> *significant adverse effects, either individually or cumulatively, on coastal resources. In addition, land divisions, other than leases for agricultural uses, outside existing developed areas shall be permitted only where 50 percent of the usable parcels in the area have been developed and the created parcels would be no smaller than the average size of surrounding parcels.*

One of the underlying premises of the Coastal Act policies is the expression of the need to size infrastructure (generally roads, water, and sewer public works facilities) in a manner that does not lead to pressure to convert habitat, agricultural lands, or threaten coastal resources in other ways. Concerns have been raised that the proposed Indianola Interchange c~~w~~ould increase traffic capacity in the rural area of the coastal zone that surrounds it. This area contains important wetland and agricultural uses and lacks sewer and road capacity for more intensive urban (and non-Coastal Act priority) uses.

Caltrans' DEIR/S "Growth" analysis indicates:

> *Lands in the vicinity of the Indianola Cutoff are within the jurisdiction of the City of Eureka on the south side and Humboldt County on the north side, with the exception of a relatively small flag lot, which is within Eureka's City limits. The land within the County is designated and zoned for Agricultural use in an approximately 366- meter (1,200-foot) wide band along Route 101 and Rural Residential use to the east of the agricultural band.*

The DEIR acknowledged urban development potential in the area, stating:

> *Because the Eureka-Arcata Route 101 Corridor has high visibility and is the most heavily traveled corridor in the region between the larger population areas, large-scale retailers have been interested in building within the corridor. In addition, the City of Eureka has limited area zoned for commercial development. In 1993, a Sam's Club was proposed in the vicinity of Route 101 and Indianola Cutoff. The project was abandoned because of the infrastructure constraints, permit obstacles (since the area lies within the Coastal Zone and would require a Coastal Development Permit, as well as city permits and a Caltrans permit to enter) and the potential traffic impact mitigation costs. Both Costco and Wal-Mart subsequently looked at locating in the same area and decided against it for similar reasons. The Wal-Mart proposal encountered staunch local opposition from residents and businesses. In addition, the existing area zoned commercial may be insufficient for off-street parking requirements as well as a large-scale retail building with required street set-backs and landscaping. A recent proposal to expand facilities at Bracut Industrial Park was also abandoned, because of the costs of completing the environmental analysis for the project and potential mitigation costs.*

Caltrans further states:

> *Mitigation for improving growth related effects was not included as part of this project because the Route 101/Indianola Cutoff is already developed and the proposed project*

would not remove the only major obstacle to growth: growth is possible, but not likely as a result of project construction.

Construction of any large scale retail business, such as Walmart, would be considered intensification in a location that is currently zoned for commercial use. Caltrans has stated that intensification of the existing land use is possible with or without the construction of a grade separation. However, a transportation improvement alone would [not] remove the only major constraint to development intensification: in addition to transportation improvements, intensive commercial development in this area would require improved water service, sewer expansion, and coastal permits.

Caltrans maintains that other existing growth constraints in the area will be adequate to protect coastal resources and limit growth, based on the following factors:

- *Lands in the vicinity of the Indianola Cutoff are within the jurisdiction of the City of Eureka on the south side and Humboldt County on the north side, with the exception of a relatively small (approximately 4 acre) lot, which is within Eureka's City limits. The land within the County is designated and zoned for Agricultural use in an approximately 1,200-foot wide band along the Route 101 roadway and Rural Residential use to the east of the agricultural band.*

- *Land in the vicinity of the Route 101/Indianola Cutoff intersection within the city limits is zoned for commercial use in the area east of Route 101 and south of Indianola Cutoff, with a small area designated for Estate Residential use; further south and east to Walker Point Road is an area of limited commercial and residential use, isolated at the north end of the city limits, and is separated from the rest of Eureka's urban area by over a mile of sensitive wetland habitat and preserved open space. This sensitive area is well protected by adopted local plans, policies, and zoning.*

- *There is no sewer service to the area, and because of the shallow groundwater depth, the land is not suitable for most conventional septic systems. The City of Eureka is unlikely to extend sewer service to the area, due to the environmental impacts and costs associated with constructing a new pipeline across protected wetlands.*

Finally, Caltrans points out in Exhibit 28 (pp. 13-14):

The Indianola Interchange is not projected to induce growth in a manner inconsistent with the legal standard set forth on Section 30254 of the Coastal Act. Several distinct factors are operating to limit growth and development around the Indianola intersection. The Preferred Alternative's proposal for improving the level of service at that intersection, while not increasing its capacity, will not remove those barriers to growth. …

Commission Staff indicated concerns that the proposed Indianola grade separation component of the Project would pose cumulative impact and growth pressures in a

manner inconsistent with the requirements of sections 30254 and 30250 of the Act. Commission Staff was also concerned that the Indianola interchange would increase traffic capacity in the rural area of the coastal zone surrounding the intersection.

Caltrans maintains that there are mitigating factors that should address the Commission Staff's concerns: principally, there are other constraints limiting growth at Indianola. For instance, the absence of additional lanes in the Project's design means that the overall system capacity is not expanded. In addition, the land near the proposed Indianola interchange is in Humboldt County's jurisdiction and is zoned for agricultural use. South of the interchange, the land is within the City of Eureka's jurisdiction. Further, the absence of a sewage system makes development impracticable and the high water table makes it likely to stay that way.

Indeed, Wal-Mart, Sam's Club, and Costco have all expressed interest in developing near the Indianola cutoff intersection over past years, but none has done so due to the barrier imposed by coastal development permits in addition to those factors noted above. Such developments, if they did somehow occur, would be consistent with the Act due to the mandate of Section 30001.5, which requires the protection and promotion of a broad array of land uses.

Commission Staff has suggested that improved traffic flow resulting from the interchange would spur modification of zoning restrictions and encourage the installation of a sewer, but to the extent this is true, which is by no means certain, it would be equally true of the Signalized Alternative the Commission Staff has recommended.

Consistent with Section 30254, the proposed Indianola grade separation would not adversely affect businesses vital to the local economy located near the Indianola intersection. In 2010, there was a 0.7 % decline in total wage and salary employment, non-farm employment was down to -.3 % and manufacturing had steadily declined for a decade. In addition, the county has the 18th highest unemployment rate in the state. For the agricultural-zoned properties around the northeast side of Indianola Road, the Project proponent is prepared to explore mechanisms to minimize potential growth pressures or zoning changes as necessary. The Indianola improvements will not lead to growth, but they may provide a lifeline to existing businesses in the area.[6]

In addition, the Applicants are committed to working with the Commission, the County, and the City of Eureka to develop additional and effective mitigation measures through the coastal land use permitting process to assure that development pressures, if realized, do not induce growth around the Indianola interchange. Currently, ideas include creation of easements or imposition of use restrictions to meet these purposes.

[6] Caltrans Economic Analysis Branch. *2011 Humboldt County Economic Forecast*, Sacramento, available at http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2011/Humboldt.pdf

With one exception, the Commission agrees with these assertions. The Commission does not believe the legislative direction contained in Section 30001.5 of the Coastal Act (and which is not among the CCMP's *enforceable policies*, and, moreover, is too broad to be of use in interpreting consistency with the enforceable policies) is relevant to the Commission's findings with respect to Sections 30250 and 30254. However, aside from this point the Commission agrees and finds that the project, including the interchange, would avoid posing ~~Historically, the Commission has rejected the notion that potential growth-related pressures resulting from one type of infrastructure (in this case, highway capacity) can be ignored based on either reliance on existing zoning, its ability to review future zoning changes, or the presence of other infrastructure constraints. The Coastal Act requires, and the Commission has repeatedly found, that any increases in infrastructure capacity be sized and tailored to accommodate only development levels and patterns that will remain consistent with Chapter 3 policies. The Commission remains concerned over the potential for increased development pressure that may be intensified by the proposed interchange. When such pressures intensify, land use plans and zoning restrictions, as well as infrastructure, can be modified to accommodate additional development. The evidence discussed above and in the previous sections of this report make a compelling case that business decisions to locate and expand non-Coastal Act priority uses in this area would be more likely to occur if traffic ingress and egress is improved by the proposed interchange. By facilitating such development the interchange would increase pressure to modify other infrastructure constraints and potentially convert high priority uses under the Coastal Act (such as agriculture and sensitive habitat areas) to lower priority uses. The Commission therefore concludes that the proposed Indianola Interchange component of the project would pose~~ cumulative impact concerns and growth pressures that would render it~~in a manner~~ inconsistent with the requirements of Sections 30254 and 30250 of the Coastal Act.

IV. PROCEDURE IF COMMISSION CONDITIONALLY CONCURS~~OBJECTS~~

Section 930.4~~63(b)~~ of the federal consistency regulations (15 CFR Section 930.4~~63(b)) states that, if the Commission's objection is based on a finding that the proposed activity is inconsistent with the CCMP, it may identify measures, if they exist, that would bring the project into conformance with the CCMP. Section 930.63~~ provides:

> *(a) If … a State agency issues a conditional concurrence:*
>
> *(1) The State agency shall include in its concurrence letter the conditions which must be satisfied, an explanation of why the conditions are necessary to ensure consistency with specific enforceable policies of the management program, and an identification of the specific enforceable policies. The State agency's concurrence letter shall also inform the parties that if the requirements of paragraphs (a)(1) through (3) of the section are not met, then all parties shall treat the State agency's conditional concurrence letter as an objection pursuant to the applicable subpart and notify, pursuant to § 930.63(e), applicants, persons and applicant agencies of the opportunity to appeal the State agency's objection to the Secretary of Commerce within 30 days after receipt of the State agency's conditional concurrence/objection or 30 days after receiving notice from the Federal agency that the application will not be approved as amended by the State agency's conditions; …*

(b) If the requirements of paragraphs (a)(1) through (3) of this section are not met, then all parties shall treat the State agency's conditional concurrence as an objection pursuant to the applicable subpart.

§930.63 State agency objection to a consistency certification.

(b) State agency objections that are based on sufficient information to evaluate the applicant's consistency certification shall describe how the proposed activity is inconsistent with specific enforceable policies of the management program. The objection may describe alternative measures (if they exist) which, if adopted by the applicant, may permit the proposed activity to be conducted in a manner consistent with the enforceable policies of the management program.

As described in Sections III A-I above, the proposed project is inconsistent with the CCMP. In order to bring the activity into conformance with the CCMP, Caltrans needs to modify the activity to include the following provisions:

1. Revise the project to eliminate the raised fill slopes and other elements of the Indianola Interchange, and replace it with an at-grade solution such as a traffic light signal design, in a manner minimizing wetland impacts to the degree possible.

2. Provide for a separated bicycle/pedestrian corridor on one or both sides of the highway along the entire Corridor, unless Caltrans commits, at this time, that it will establish to the Commission's satisfaction that an alternative parallel trail nearby (from Arcata to Eureka) will be funded prior to or concurrent with construction of the 101 Corridor and that it will have the necessary ownership interests or permissions to be allowed to proceed.

3. If other issues can be resolved, and prior to any Commission review of a coastal development permit for the project: (1) expand the Samoa restoration concept to include true tidal restoration; (2) provide a biological analysis showing that adequate acreages and/or habitat mixes would, in fact, fully mitigate the project's impacts; (3) submit and receive Commission approval of coastal development permits for the restoration activities at the two sites; and (4) follow up on Caltrans' commitment to further substantiate the unavailability and infeasibility of non-agricultural sites in the Humboldt Bay area.

V. RIGHT OF APPEAL

If Caltrans does not agree to the conditions, and as discussed in the previous paragraph, the Commission's conditional concurrence is treated as an objection, then pPursuant to 15 CFR Part 930, Subpart H, and within 30 days from receipt of the Commission's letter notifying Caltrans of the Commission's action, Caltrans may request that the Secretary of Commerce override the Commission's "objection" to consistency certification CC-016-13. In order to grant an override request, the Secretary must find that the activity is consistent with the objectives or purposes of the Coastal Zone Management Act, or is necessary in the interest of national security. A copy of the request and supporting information must be sent to the California Coastal Commission, the

U.S. Army Corps of Engineers, and the Federal Highway Administration. The Secretary may collect fees from Caltrans for administering and processing its request.

APPENDIX A

SUBSTANTIVE FILE DOCUMENTS:

1. Consistency Certification No. CC-016-13, Caltrans, Resubmitted Consistency Certification, Eureka-Arcata 101 Corridor, with attachments, February 2013).

2. Consistency Certification No. CC-054-11 (Caltrans, Eureka-Arcata 101 Corridor).

3. Route 101 Eureka-Arcata Corridor Improvement Project Federal Coastal Consistency ADDENDUM, February 2013.

4. Draft Environmental Impact Statement/Environmental Impact Report, Eureka – Arcata Route 101 Corridor Improvement Project, U.S. Department of Transportation, Federal Highway Administration (FHWA) and the State of California Department of Transportation (Caltrans), For the Humboldt County Association of Governments (HCAOG), June 2007.

5. APPLICATION: 1-07-013 Caltrans, Highway 101, Mad River Bridges, Between Arcata and McKinleyville, unincorporated area of Humboldt County.

6. CDP 1-11-048 California Department of Fish and Wildlife After-the-fact authorization for the restoration of 16 acres of seasonal freshwater marsh (diked former tidelands) to restored tidal marsh, CDFW Fay Slough Wildlife Area east of Highway 101 and Humboldt Bay, south of Walker Point Road, Humboldt Co.

7. CDP 1-07-038, Caltrans, Highway 101/Route 36 Alton Interchange, south of Fortuna, Humboldt Co.

8. CDP 6-11-093 Caltrans, Replacement/Construction of I-5/Genessee Ave, San Diego.

9. CDP 1-05-014, RDHC, Vance Dairy wetland pond excavation, near Hookton Rd. and Hwy 101, south Humboldt Bay.

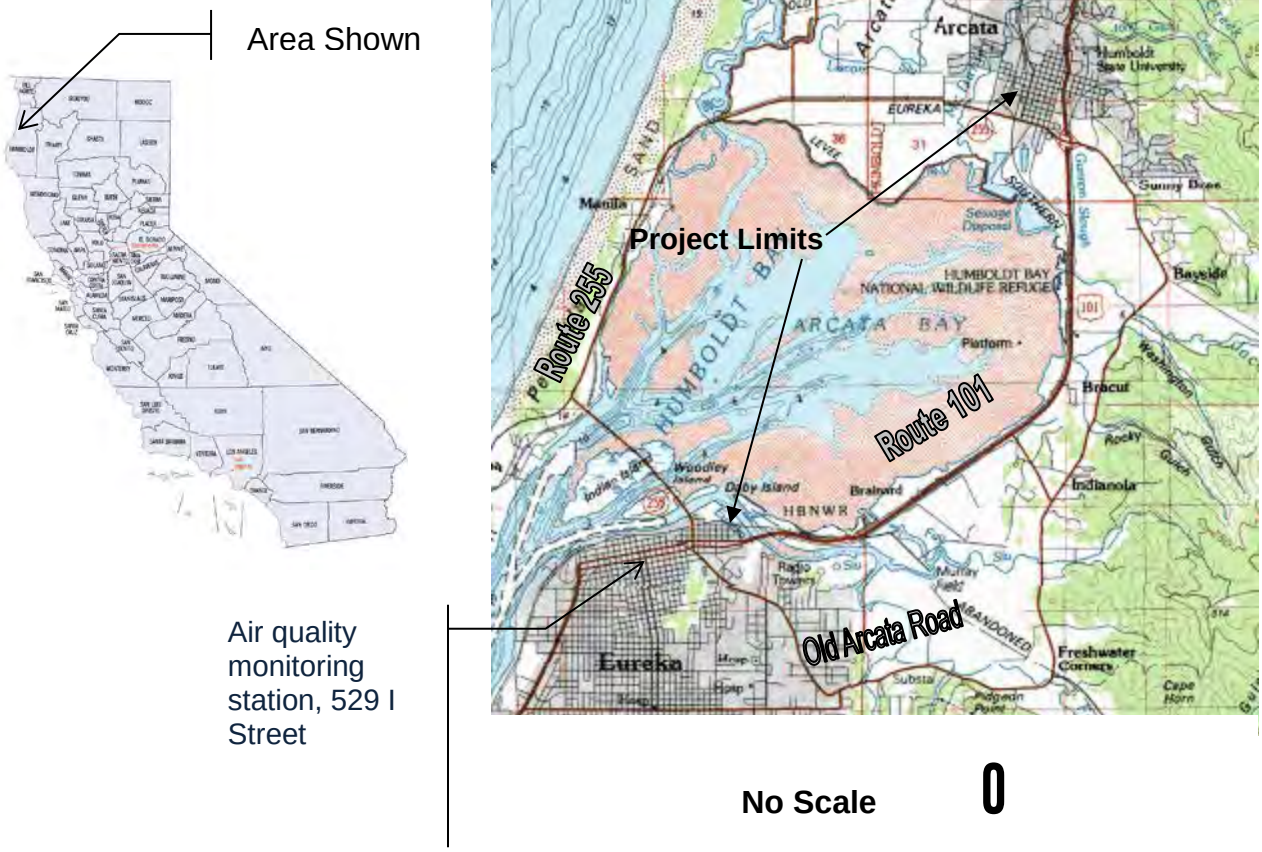
10. CDP 1-06-036 and 1-06-036-A1 (City of Arcata Department of Environmental Services – McDaniel Slough Wetland Enhancement Project).

11. CDP 6-12-060, Caltrans, addition of auxiliary lane to I-5/I-8 intersection, near Sea World, San Diego.

12. Route 101 Concept Report, Caltrans, October 2002.

13. California Coastal Trail (CCT) Definition & Siting and Design Standards, Coastal Conservancy.

14. Climate Change Adaptation Pilot Strategy for Critically Vulnerable Assets in Northwest California.



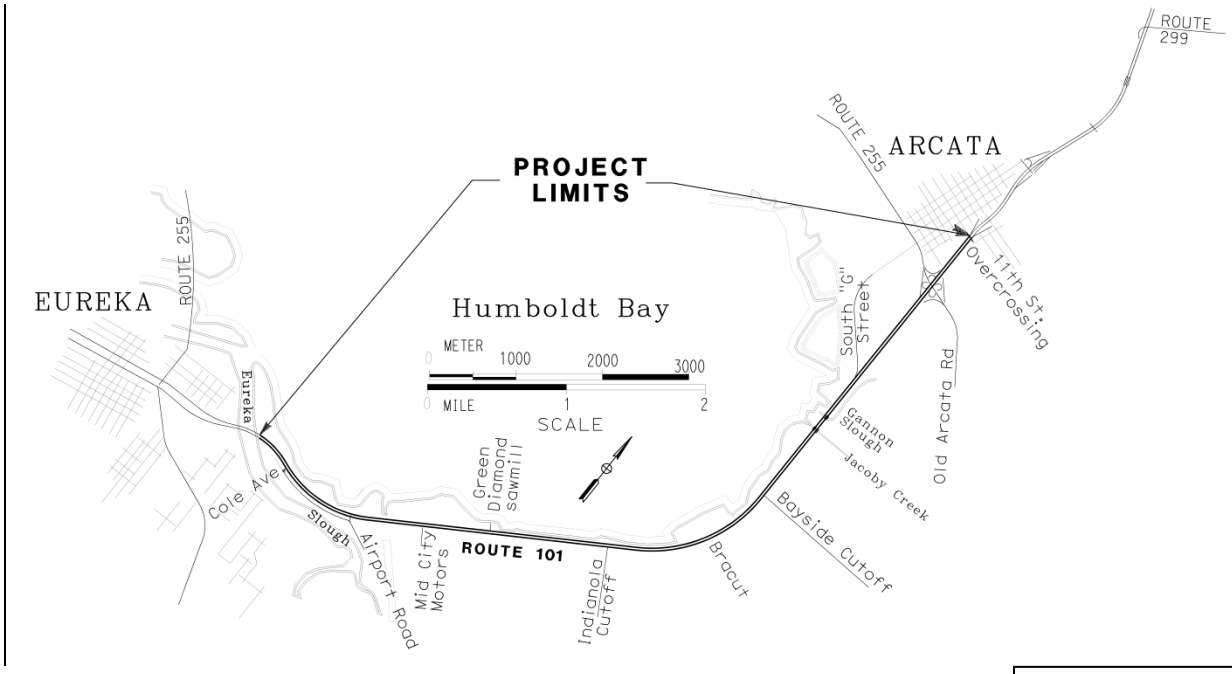


EXHIBIT 1
CC-016-13
CALTRANS

Figure S-1
Project Location Maps

Figure S-2

Aerial Photograph of North Humboldt Bay

FIGURE S-2
AERIAL PHOTOGRAPH OF
NORTH HUMBOLDT BAY

EXHIBIT 2
CC-016-13
Aerial Photo

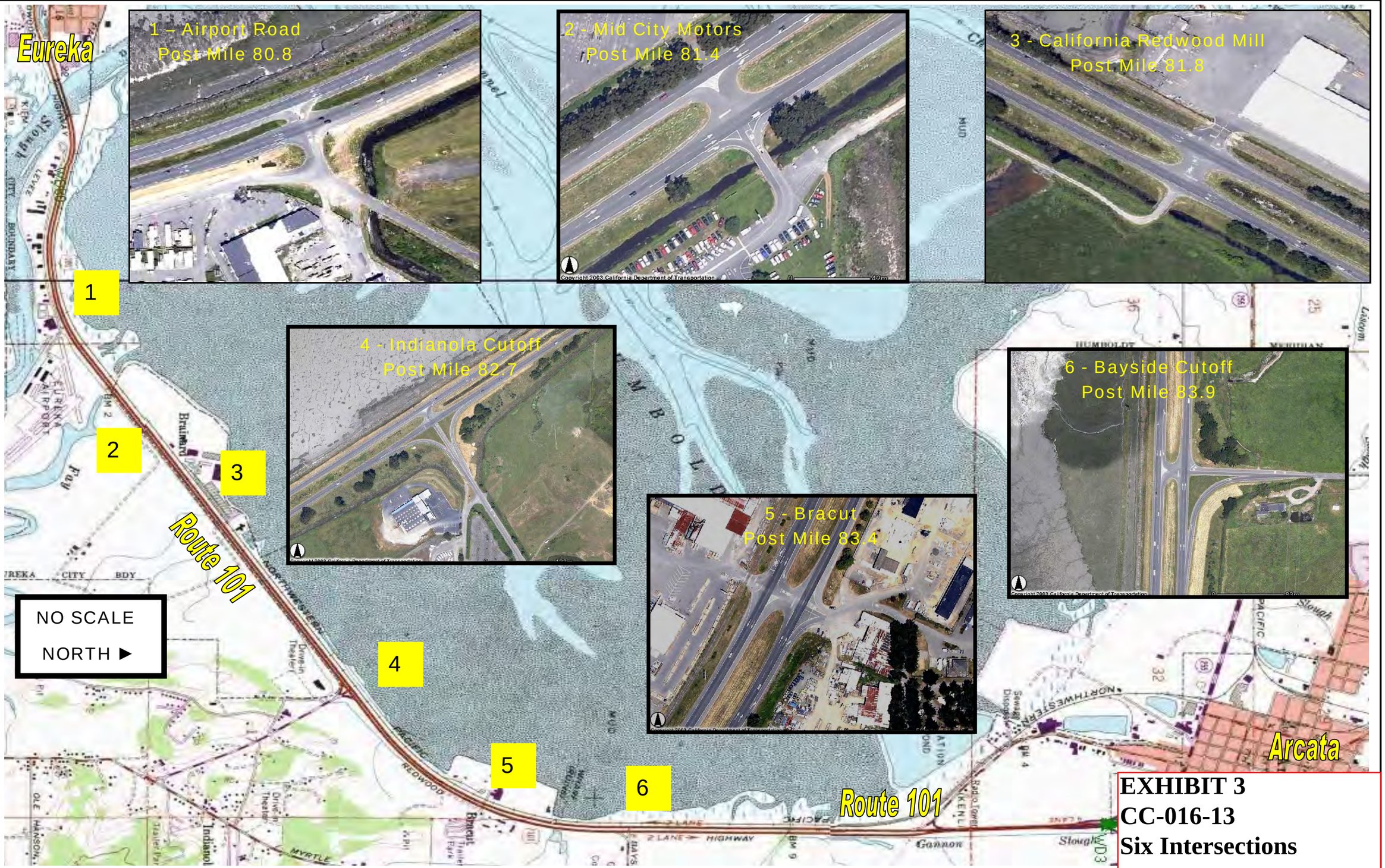
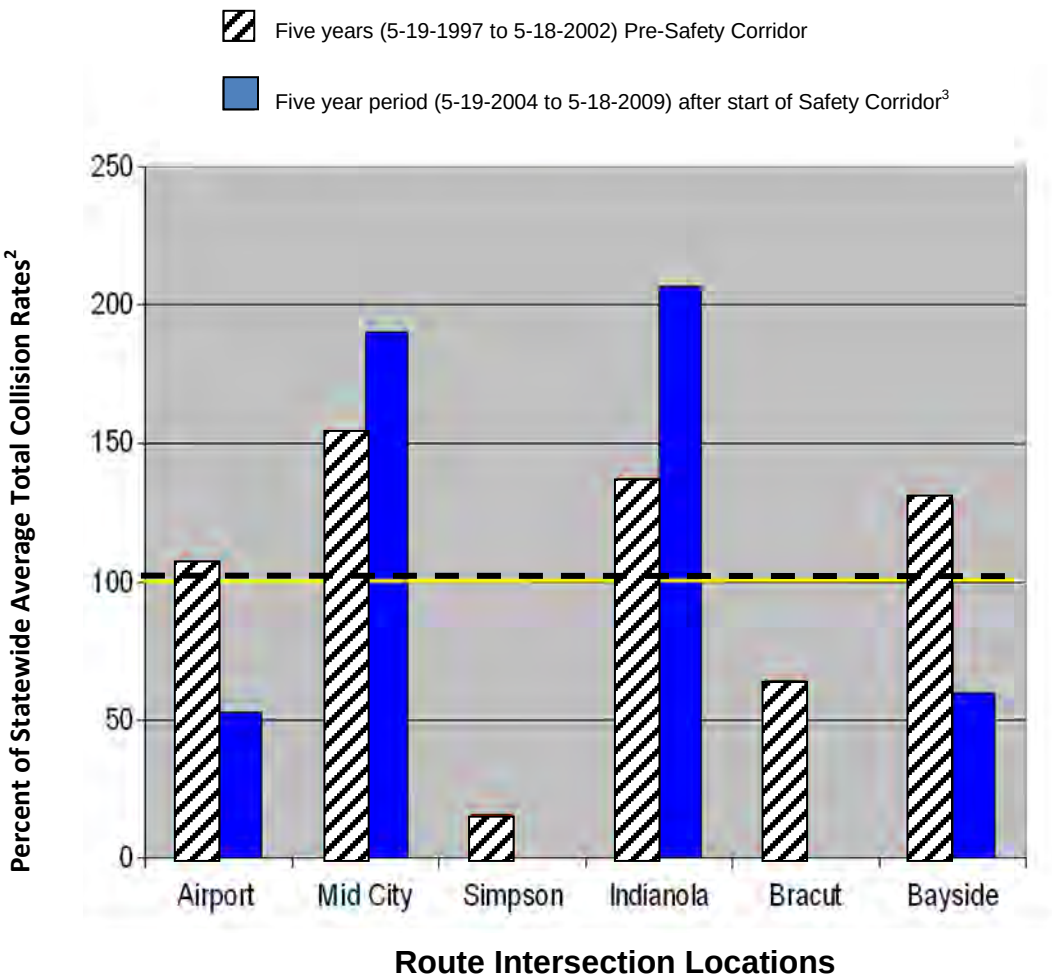


EXHIBIT 3
CC-016-13
Six Intersections

Figure S-3
Route 101 Existing Open Median Locations

Figure 2-2 – Average Total Collision Rates at Route 101 Intersections as a Percentage of Statewide Average Rates[1]



Note 1: Total collisions consist of all types of collisions: fatal, injury, and property damage.

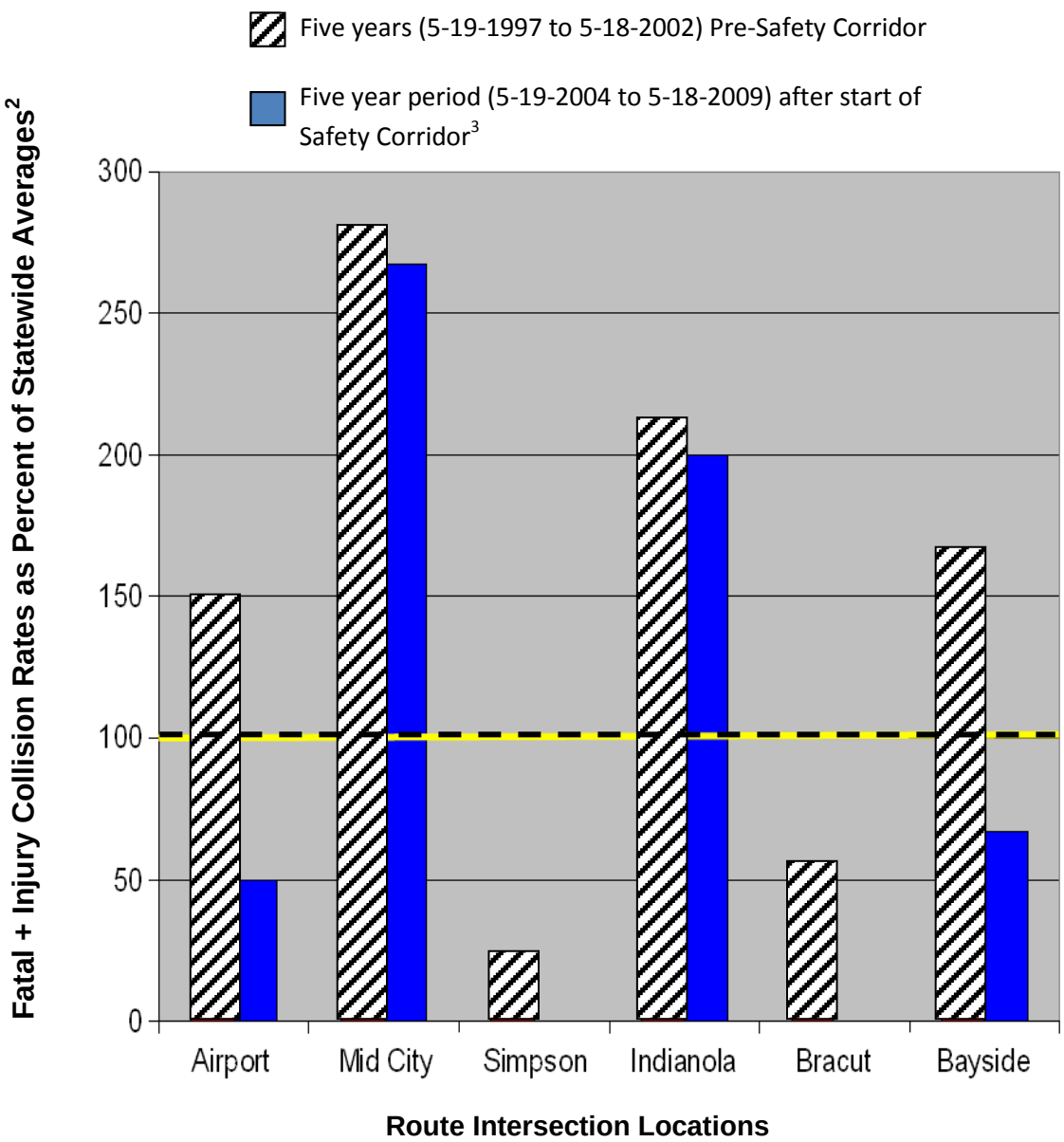
Note 2: For intersections, collision rates are a measure of the number of collisions per million vehicles. One hundred represents the percentage of the statewide average collision rate for similar highway intersections and is designated by the dashed horizontal line in the graph.

Note 3: The Safety Corridor was started on May 19, 2002.

Source: Collision data obtained from Caltrans Transportation System Network (TSN). District 1 Traffic Safety.

EXHIBIT 4
CC-016-13
Collision Rates

Figure 2-3 – Average Severe Collision Rates at Route 101 Intersections as a Percentage of Statewide Average Rates[1]



Note 1: Severe collisions consist of fatal and injury collisions.

Note 2: For intersections, collision rates are a measure of the number of collisions per million vehicles. One hundred represents the percentage of the statewide average collision rate for similar highway intersections and is designated by the dashed horizontal line in the graph.

Note 3: The Safety Corridor was started on May 19, 2002.

Source: Collision data obtained from Caltrans Transportation System Network (TSN). District 1 Traffic Safety.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

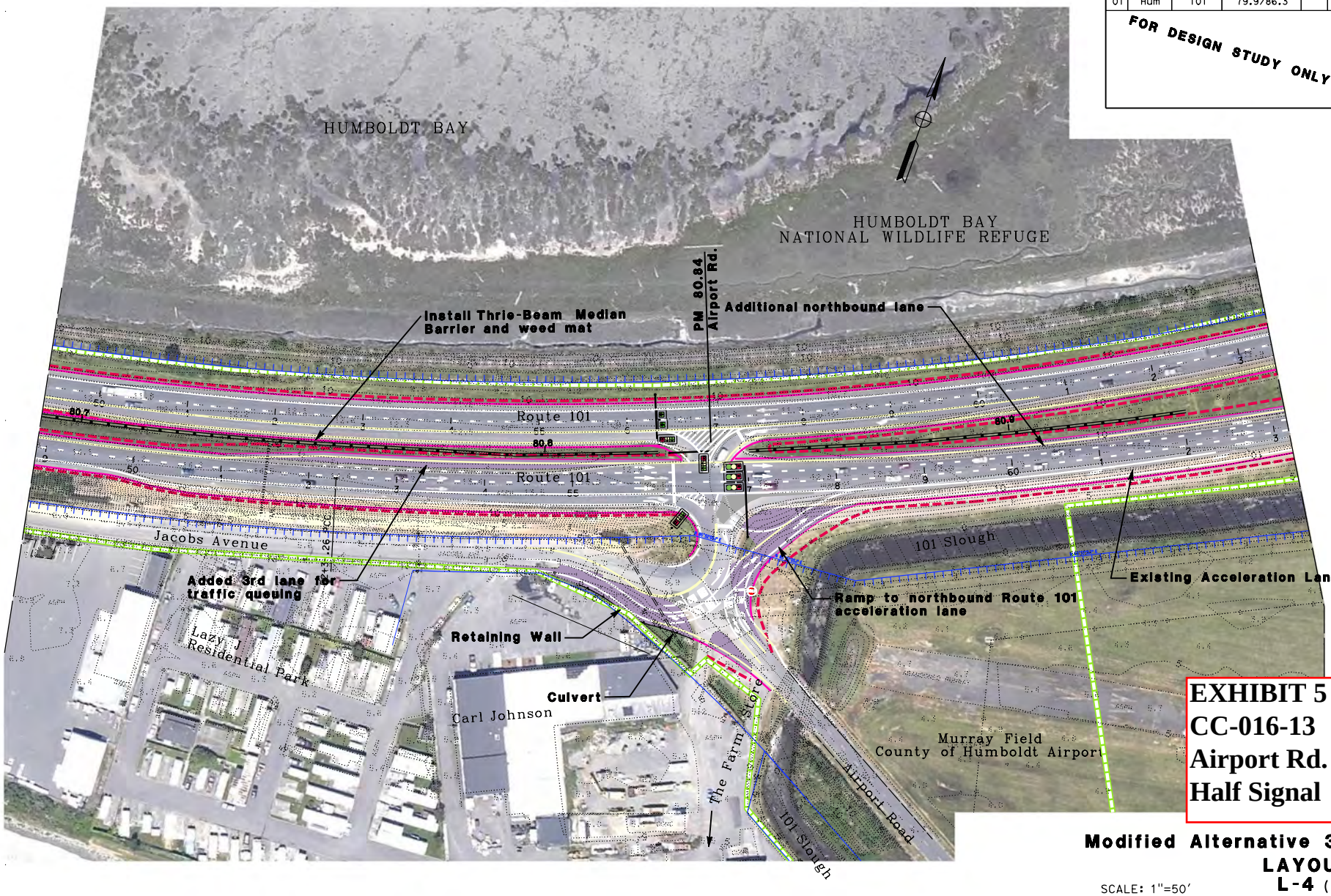


EXHIBIT 5
CC-016-13
Airport Rd.
Half Signal

Modified Alternative 3A
LAYOUT
L-4 (iv)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	TODD LARK	REVISED BY	
Caltrans DESIGN	L.R. ASHLEY	CHECKED BY		DATE REVISED	

LAST REVISION 08-11-08 DATE PLOTTED => 12-OCT-2012 TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s119316 DGN FILE => 136330ea004-rev.dgn | CU 03232 | EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

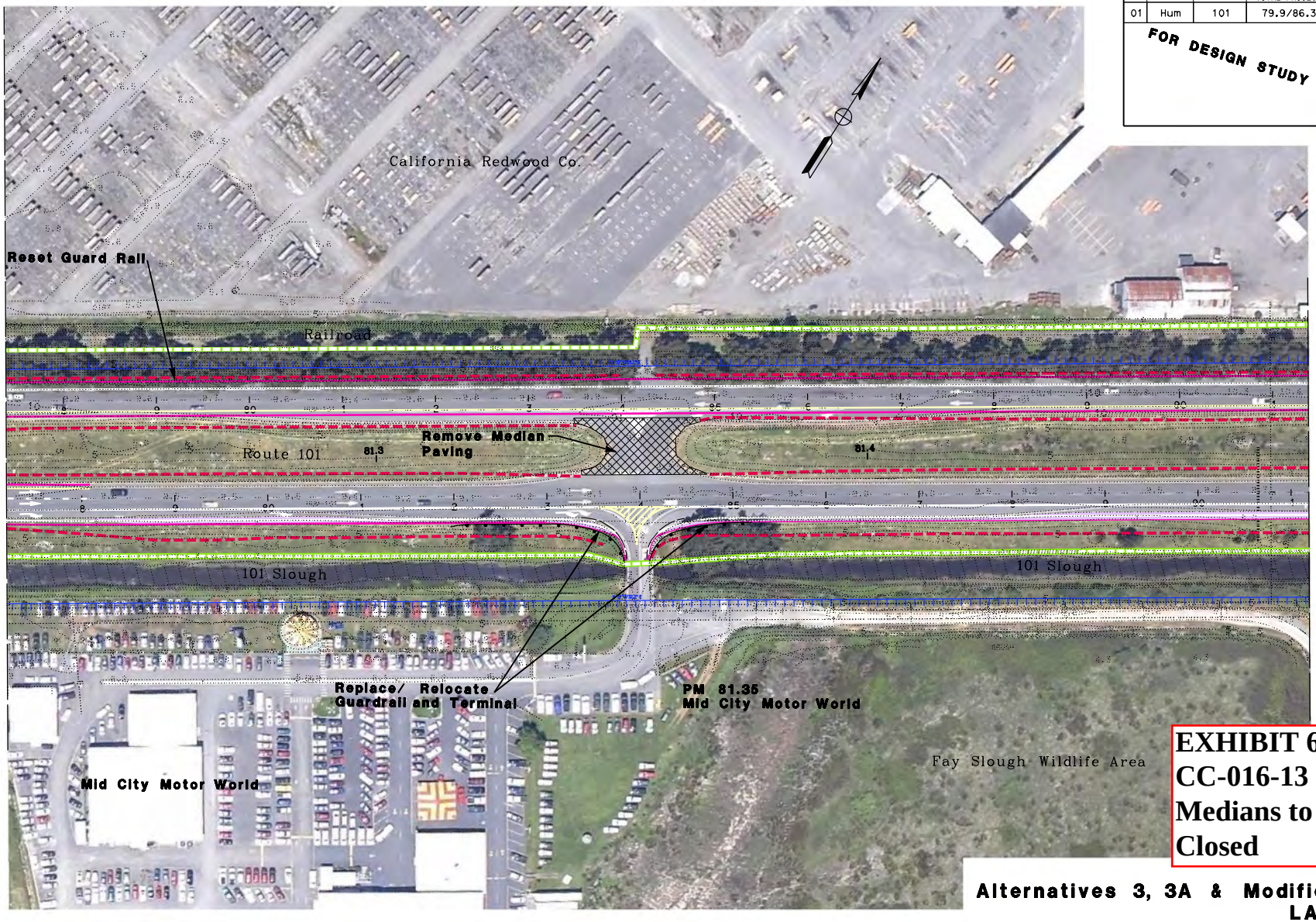


EXHIBIT 6
CC-016-13
Medians to be Closed

Alternatives 3, 3A & Modified 3A
LAYOUT
L-6 (i)

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

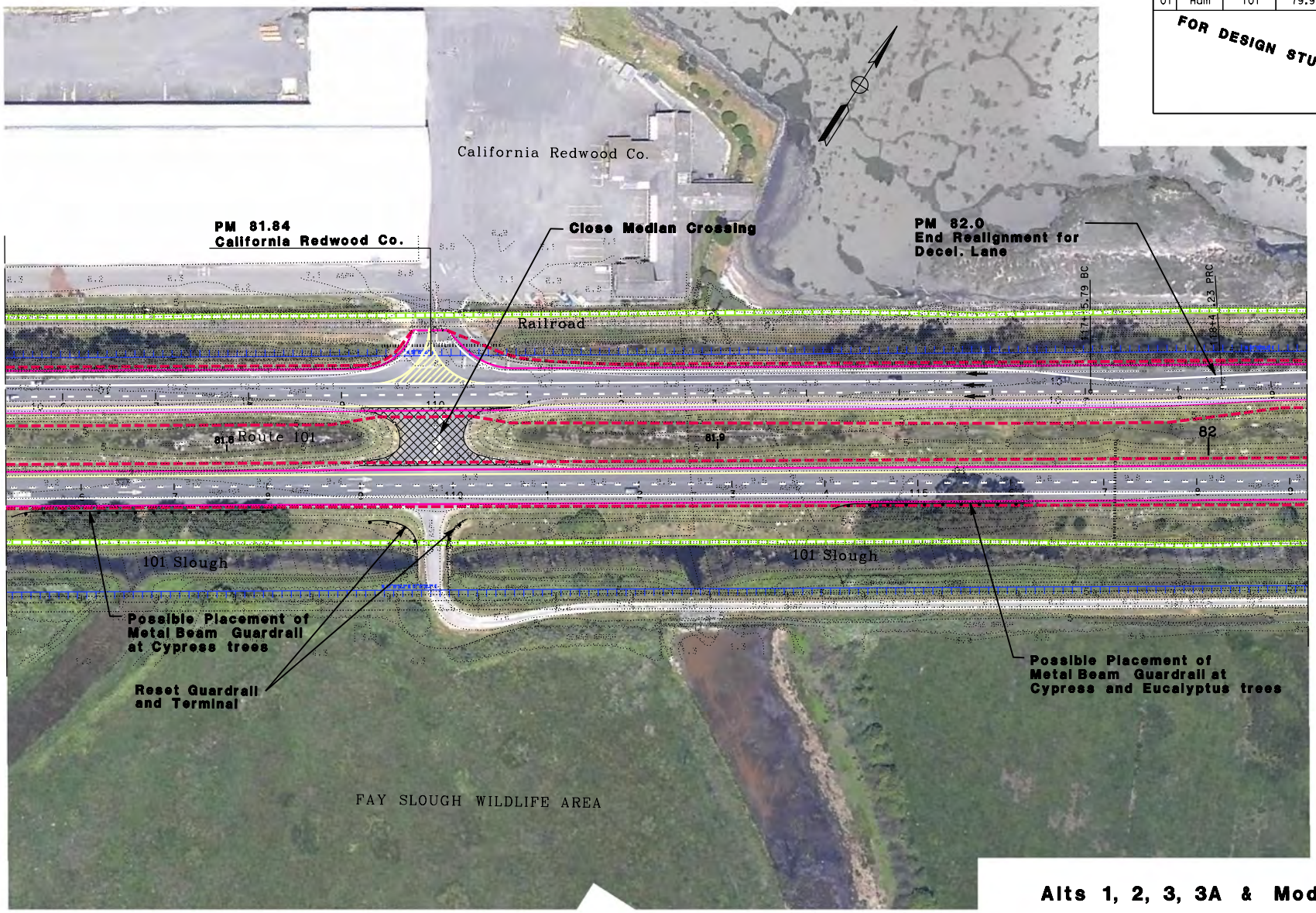
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED
TIME PLOTTED

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea006-rev.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 2, 3, 3A & Modified 3A
LAYOUT
L-8

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

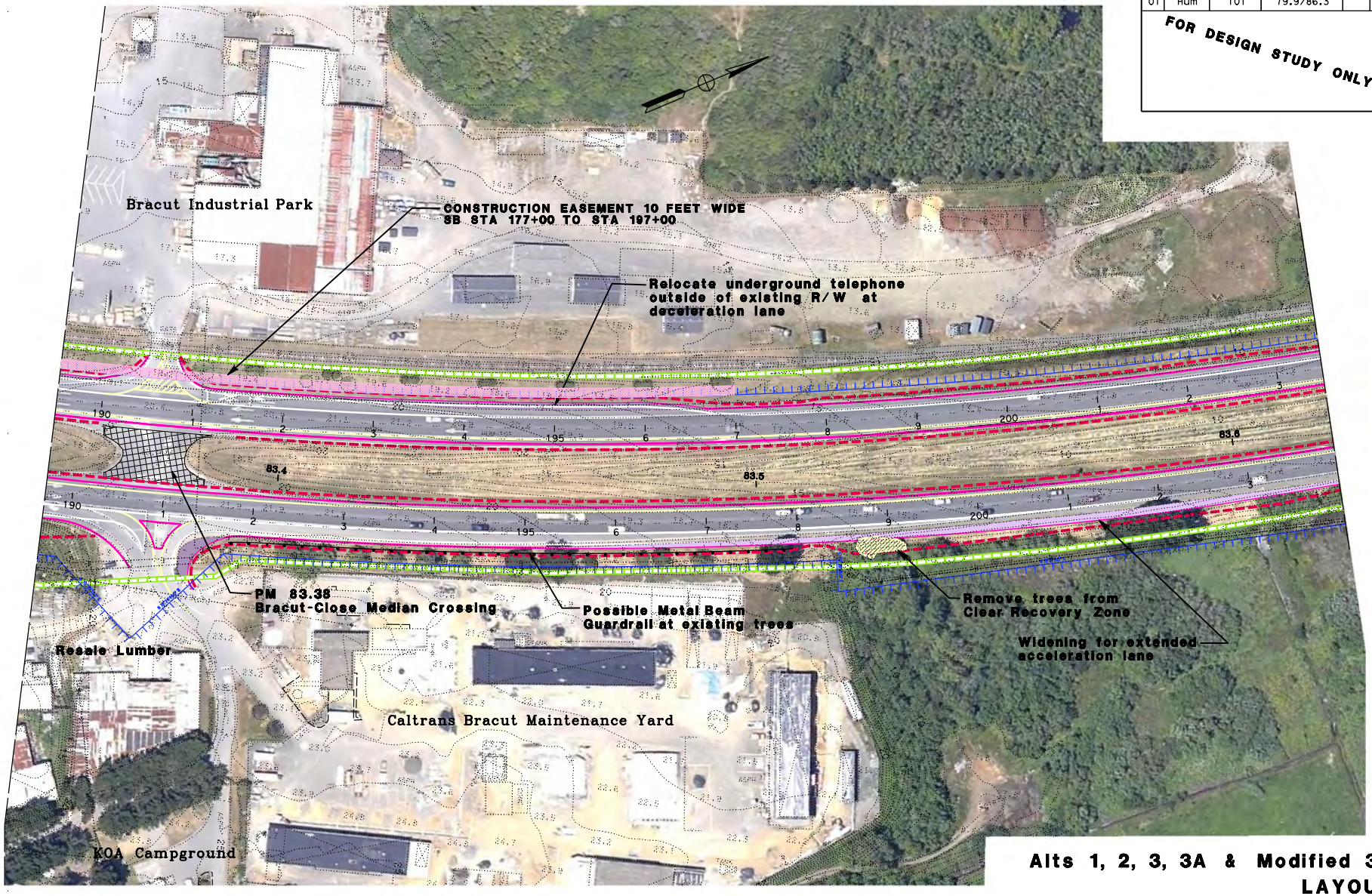
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:18

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea008.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Alts 1, 2, 3, 3A & Modified 3A

LAYOUT
L-14

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

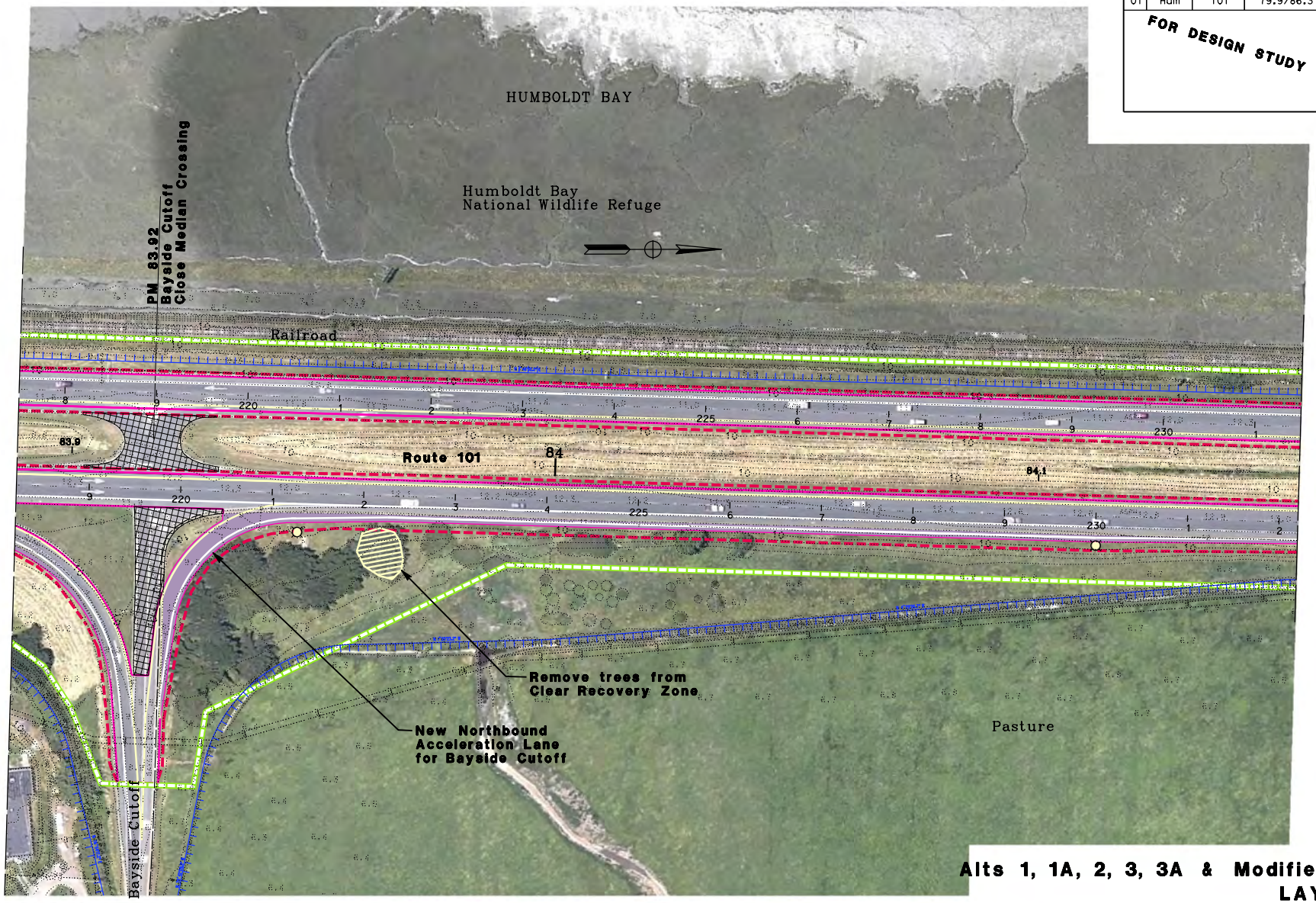
FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 12-OCT-2012
TIME PLOTTED => 15:25

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea014.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY



Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-16

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 08-OCT-2012
TIME PLOTTED => 10:52

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea016.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

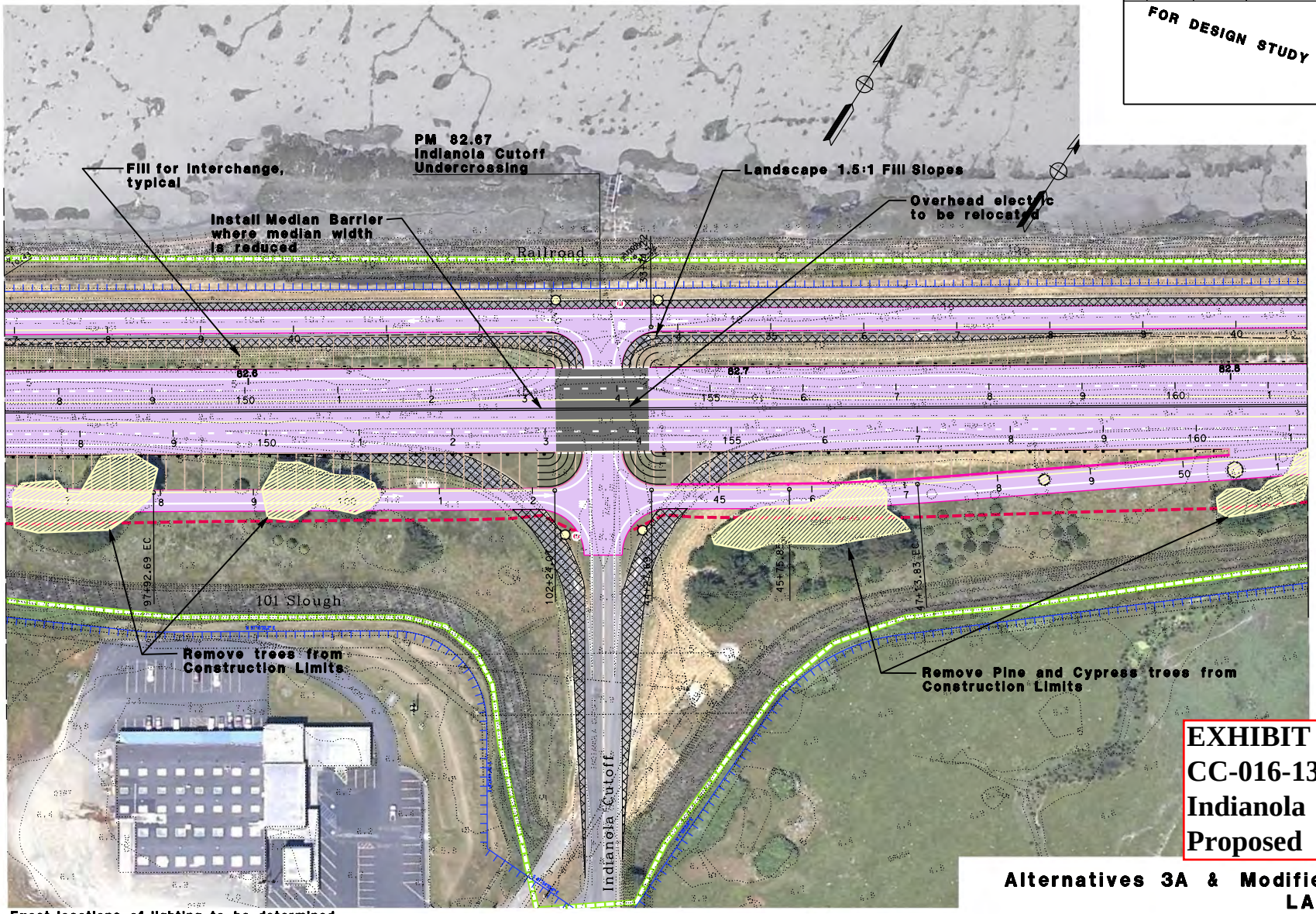


EXHIBIT 7
CC-016-13
Indianola
Proposed

Exact locations of lighting to be determined.
Trenching for lighting not shown.

Alternatives 3A & Modified 3A
LAYOUT
L-11

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION DATE TIME: 08-11-08

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea011.dgn
CU 03232
EA 363301

- Motorists on Route 101 as they approach and pass the new interchange from either direction;
- Westbound motorists on Indianola Cutoff as they approach the new interchange;
- A few local residents within the vicinity of Indianola Cutoff; and
- Views from Humboldt Bay looking east toward the shore at the new interchange.

The following Figures 3-7 through 13 represent visual simulations of the proposed interchange configuration as it would appear from different perspectives.

Figure 3-7
Proposed Interchange Design Configuration

EXHIBIT 8
CC-016-13
Indianola
Design Configuration

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

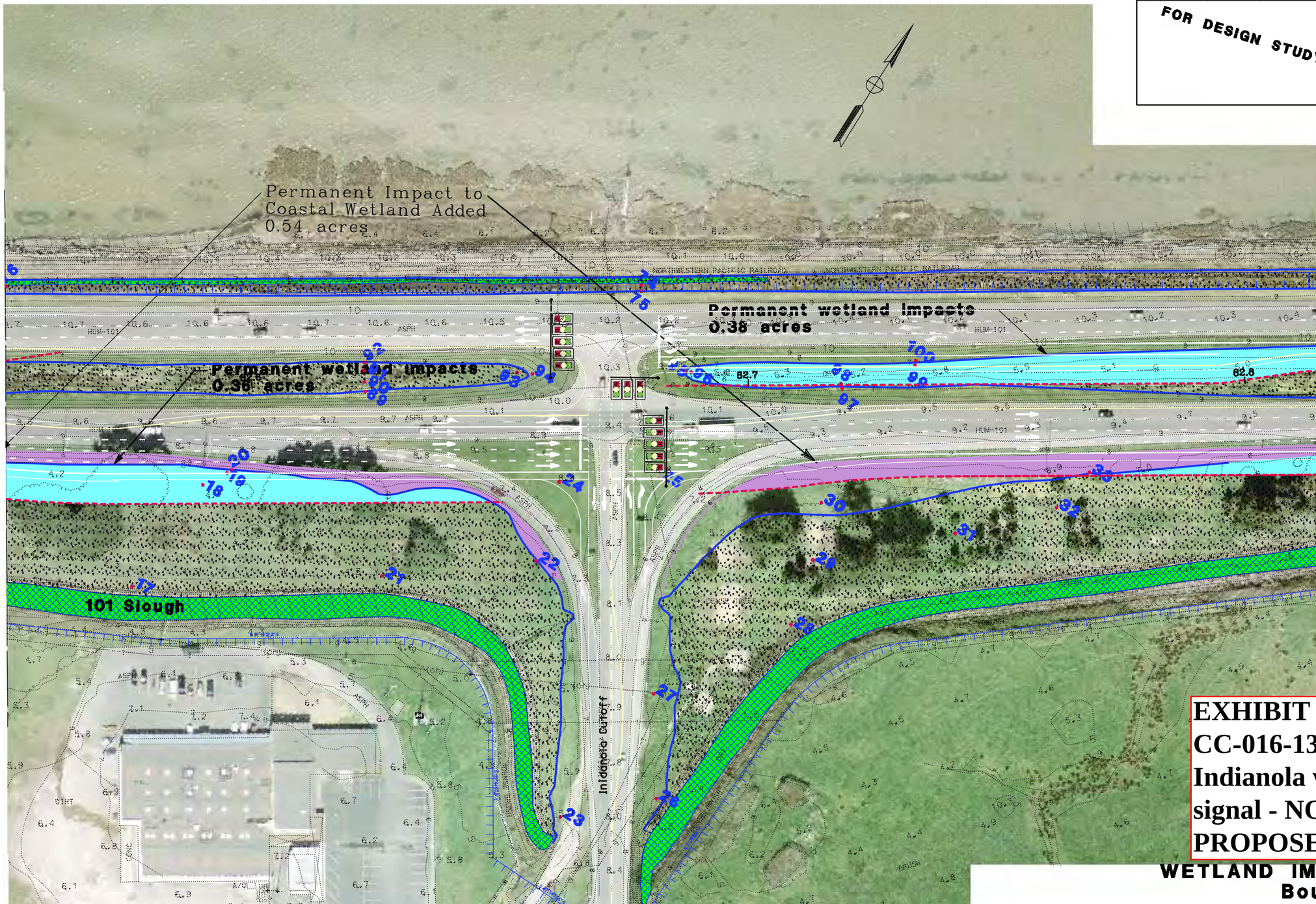


EXHIBIT 9
CC-016-13
Indianola with a signal - NOT PROPOSED

WETLAND IMPACTS
Boulevard
LAYOUT
L-11

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY

CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY

REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED => 14-JUN-2012
TIME PLOTTED => 09:59

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s119316
DGN FILE => 136330wet011-blvd.dgn

CU 03232

EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

FOR DESIGN STUDY ONLY

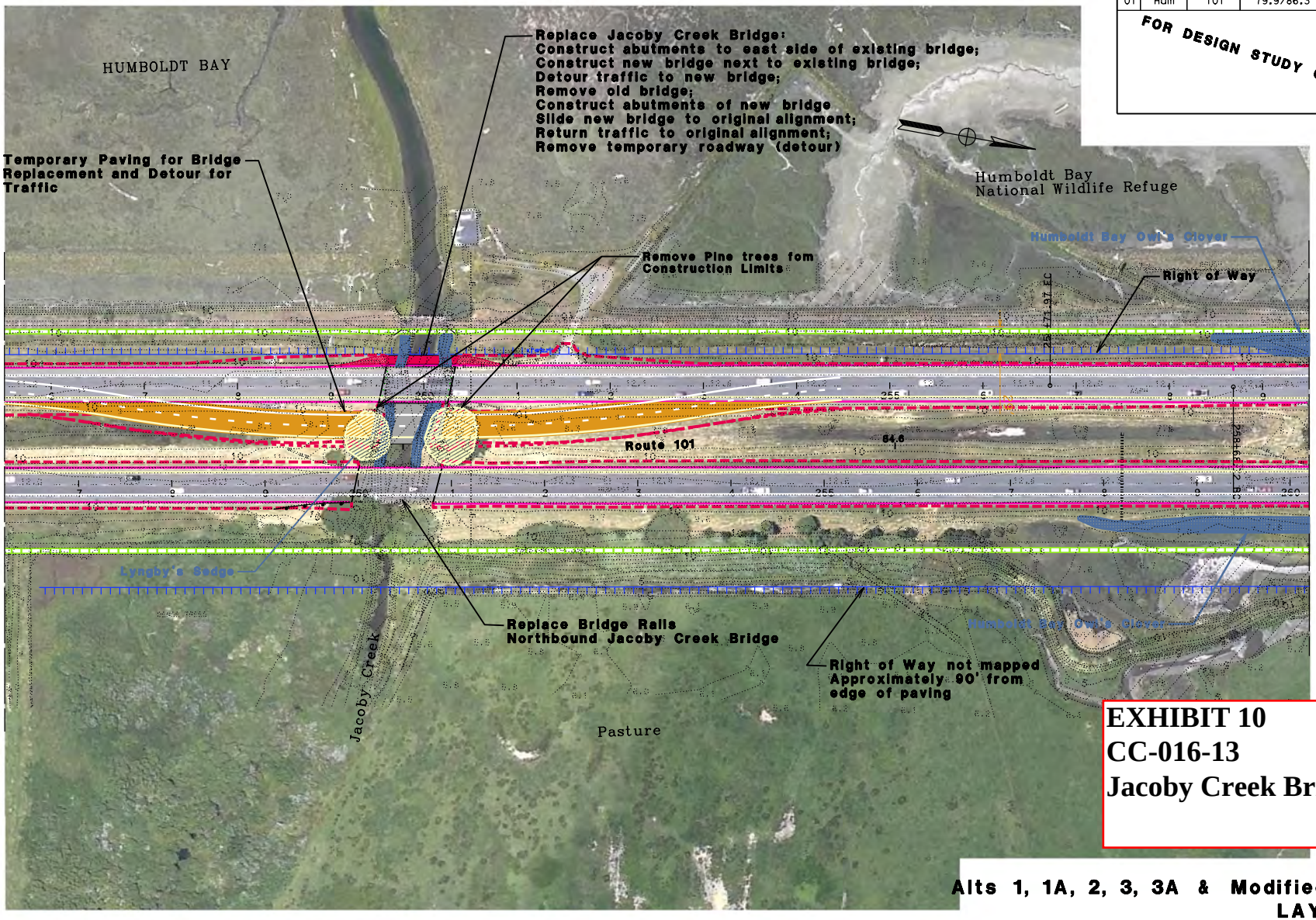


EXHIBIT 10
CC-016-13
Jacoby Creek Bridge

Alts 1, 1A, 2, 3, 3A & Modified 3A
LAYOUT
L-18

SCALE: 1"=50'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 08-11-08
DATE PLOTTED
TIME PLOTTED => 10:53

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => 136330ea018.dgn
CU 03232
EA 363301

Figure 1

Locations of proposed bridgework and tide gate replacements, EA 363301, HUM 101-79.8/86.3, Eureka-Arcata Corridor Improvements

	PM/dir	Location	Existing	Proposed
TIDE GATES	80.0/NB	1. Jacobs Ave	18" round gate	1- standard or tideflex
	80.88/NB	2. Airport Ave (101 Channel)	double 5'x5' gates	1- standard or tideflex, 1- Fish-friendly Design
	81.13/NB	3. California Redwood Sawmill	48"x 36" gate	1- standard or tideflex
	83.6/NB	4. Brainard Slough	24" round gate	1- Fish-friendly Design
	84.26/SB	5. Old Jacoby Creek	5'x5' gate	1- Fish-friendly Design
	84.93/NB	6. Gannon Slough	triple 5'x6' gates	1- Fish-friendly Design, 2- standard or tideflex
BRIDGES	84.3/SB	A. Jacoby Creek	39-foot wide bridge	New Bridge 51.4 feet wide (increase of 12.4 ft.)
	84.3 NB	B. Jacoby Creek	39-foot wide bridge	Replace Bridge Rail
	84.5 NB	C. Gannon Slough	39-foot wide bridge	Replace Bridge Rail

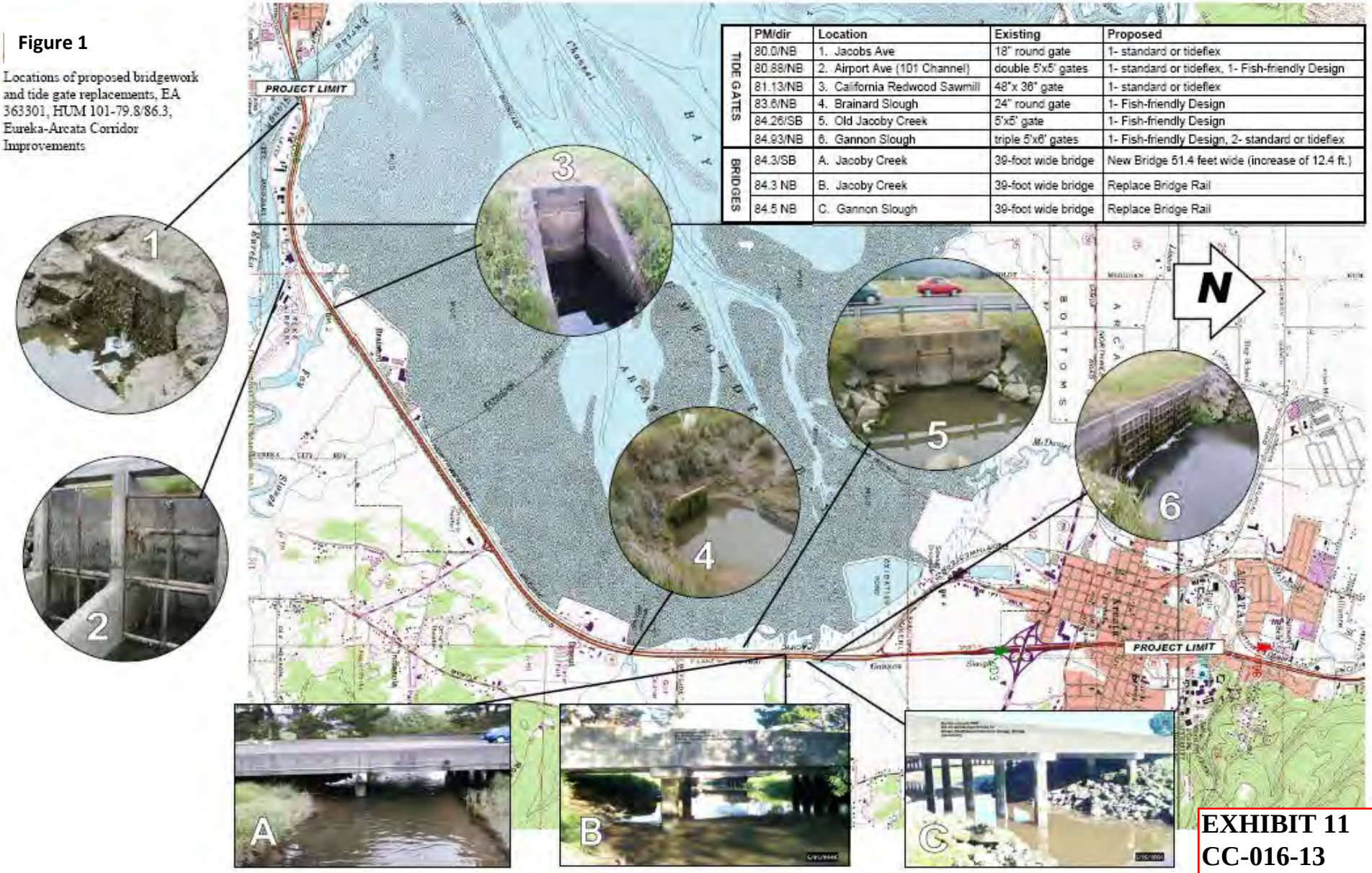


EXHIBIT 11
CC-016-13
Tide Gates

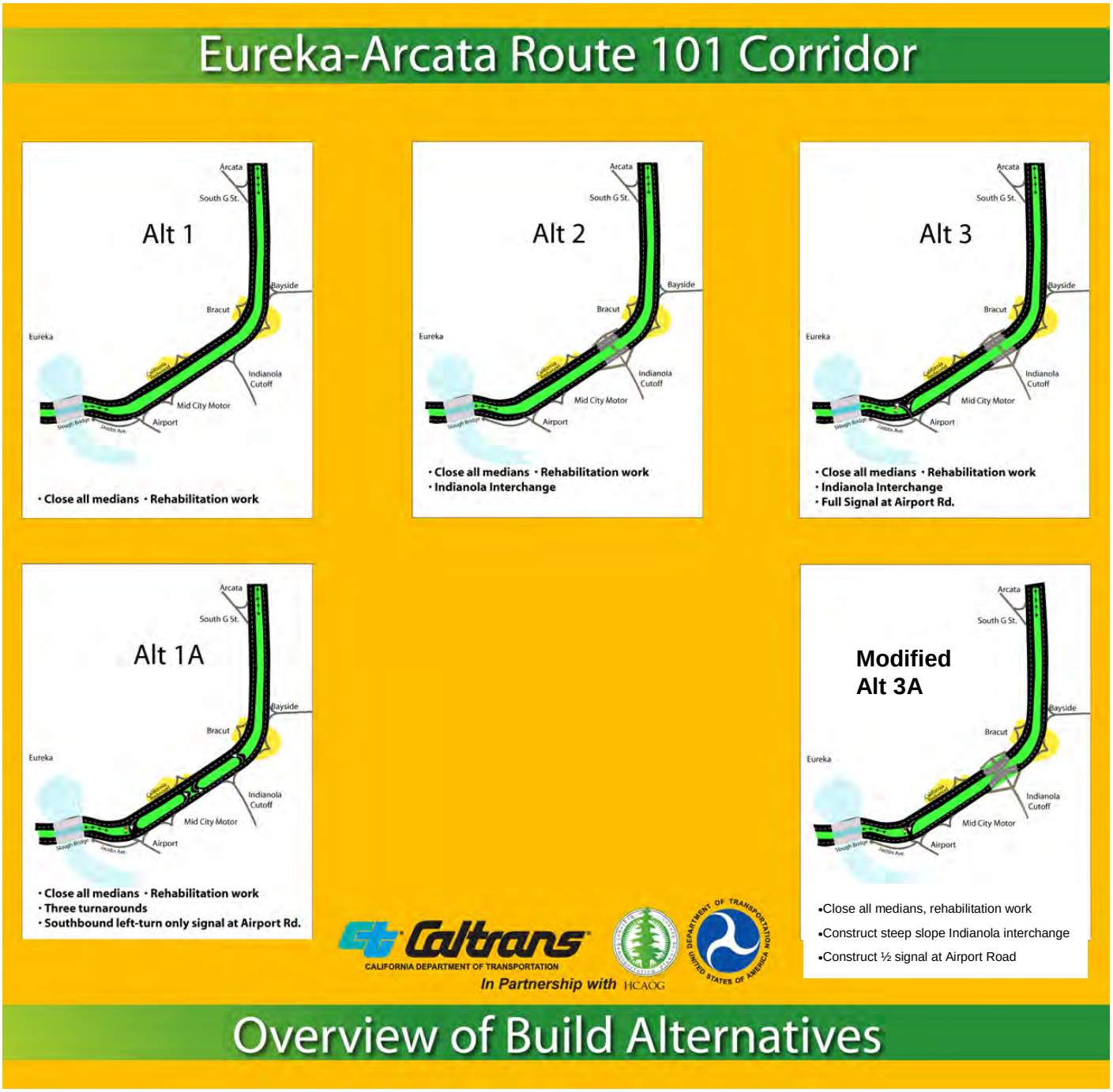


Figure S-4

EXHIBIT 12
CC-016-13
Alternatives Overview

Summary of Potential Adverse Environmental Consequences
After Avoidance and Implementation of Measures to Minimize Harm/Mitigation#

Environmental Resource/Condition Compared to No Build Alternative	Alternative 1 Close median crossings $29 Million	Alternative 1A Close median crossings, construct two turnarounds and a southbound only left-turn signal at Airport Road $38 Million	Alternative 2 Close median crossings, construct interchange at Indianola Cutoff $55 Million	Alternative 3 Close median crossings, construct interchange at Indianola Cutoff and a full signal at Airport Road $62 Million	Modified Alternative 3A+ Close median crossings, construct steep slope interchange at Indianola Cutoff and a half signal at Airport Road $46 Million	No-Build Alternative
Total permanent wetland impact# in acres ≤3-Param / USACE Jurisd. / TOTAL	1.3 / 2.4 / **3.7**	1.7 / 5.5 / **7.2**	2.1 / 10.4 / 12.5	2.2 / 12.9 / 15.1	2.0 / 8.2 / 10.3	0
Total permanent impacts in acres to Other Waters of the U.S. (excludes wetland & habitat enhancements)**	0	0	0	0	0	0
Temporary wetland impact# in acres ≤3-Param / USACE Jurisd. / TOTAL	0.3 / 3.8 / **4.1**	0.3 / 4.5 / **4.8**	0.1 / 5.1/ **5.2**	0.1 / 4.9/ **5.1**	0.1 / 4.4/ **4.5**	Not applicable
Listed, Threatened, Endangered Species	Minor	Minor	Minor	Minor	Minor	No Effect
Water quality during construction	Minor	Minor	Minor	Minor	Minor	No Effect
Floodplain encroachment	Negligible	Negligible	Negligible	Negligible	Negligible	No Effect
Air quality	Minor	Minor	Minor	Minor	Minor	No Effect
Energy: Year 2031 vehicle fuel increase in gallons per day	3,970	340	2,150	60	290	Unknown*
Increase in greenhouse gas emissions compared to the No-Build Alternative	15.6%	1.5%	8.3%	2.4%	1.0%	N/A
Traffic increase on local roads	Substantial	Minor	Minor	Minor	Minor	Moderate*
Pedestrian and bicycle circulation	Substantial	Substantial	Moderate	Minor	Minor	Unknown*
Route 101 Corridor business access	Substantial	Moderate	Substantial	Minor	Minor***	Moderate*
Environmental Justice communities	Substantial	Moderate	Moderate	Minor	Minor***	Moderate*
Out of direction travel / delay	Substantial	Minor	Moderate	Minor	Minor	Moderate*
Potential for growth related/indirect effects	Minor	Minor	Minor	Minor	Minor	No Effect
Noise	Minor	Minor	Minor	Minor	Minor	Unknown*
Hazardous waste	Minor	Minor	Minor	Minor	Minor	No Effect
Cultural resources	No effect	No effect	No effect	No effect	No effect	No Effect
Trees removed, visual quality	23 - Minor	83 - Moderate	64 - Moderate	64 - Moderate	54 - Moderate	No Effect

+ Alternative 3A has been modified since it was introduced at the December 3, 2008 public meeting. The Modified Alternative 3A would permanently impact approximately 0.5 acres of additional wetland compared to the initial Alternative 3A proposal. The additional wetland impact is required for an additional northbound Route 101 lane and a half signal at Airport Road. These improvements would provide a westbound left turn option from Airport Road to southbound Route 101 to serve businesses and an Environmental Justice Community on Jacobs Avenue. The westbound left-turn movement may need to be closed 15 to 20 years after construction as traffic volumes increase.

All temporary and permanent wetland impacts resulting from the project will be fully mitigated pursuant to public resource agencies' regulations.

*Even though the No-Build Alternative does not include any proposed roadway changes, traffic volumes and speeds are expected to increase in the foreseeable future, which may necessitate closing one or more Route 101 intersection Closing one or more intersection median openings could potentially restrict access to businesses and residences; add out-of-direction travel and delay; increase fuel consumption; and, adversely affect the Level-of-Service of local street ists and pedestrians as well as motorized vehicles would be affected if this were to occur. In addition, without improvements, left-turn movements onto Route 101 are predicted to degrade to Level-of-Service F in the year 2031 at the fo Road, Mid-City Motor World, California Redwood, Indianola Cutoff, Bracut, and Bayside Cutoff.

**Although some work would occur in Section 10/Waters of the U.S., none of the Build Alternatives would result in adverse impacts requiring mitigation.

*** These environmental consequences are only projected for 15 to 20 years after project construction. After this period, unless there are other improvements, the consequences would likely change from minor to moderate.

EXHIBIT 13
CC-016-13
Alternative Comparison

DEPARTMENT OF TRANSPORTATION
DISTRICT 1, P.O. BOX 3700
EUREKA, CA 95502-3700
PHONE (707) 441-5733
FAX (707) 441-5775
TTY 711

Flex your power!
Be energy efficient!

June 17, 2013

Mr. Mark Delaplaine, Manager
Energy, Ocean Resources
and Federal Consistency Division
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

File: 01-HUM-101
PM 79.9/86.3
01-366600
Eureka-Arcata Route 101
Corridor Improvements

Dear Mr. Delaplaine:

Per your June 4, 2013 letter requesting additional information:

A. Updated Traffic Information is included in Attachments 1-4.

B. Alternative information requested is included in Attachment 5. Per your request the estimated permanent coastal wetland impact for the entire project under this evaluation is 7.91 acres. The US 101 northbound lanes would need to be shifted to the east to accommodate truck turning for both northbound to southbound and southbound to northbound u-turn movements. Also, due to the additional lanes at Indianola Cutoff, the existing box culvert crossing Indianola Cutoff would need to be lengthened, and work to dredge and fill within the slough channel would be required.

C. Climate Change Adaptation
Per Rex Jackman, Caltrans District 1 Planning Department, the results of the "Climate Change Adaptation Pilot Strategy for Critically Vulnerable Assets in Northwest California" will not be complete until December 2014. The Request for Proposals will be out this month and staff hopes to award the work to a consultant in July 2013. While staff cannot predict what the study's short or long-term recommended actions will be, it may be possible that short-term recommendations could be incorporated into the project. It is unlikely that the long-term recommendations would be incorporated into the project.

D. Draft Wetland Mitigation/Restoration Plan response is included in Attachment 6.

E. Scenic Route Study – Per the June 7, 2013 email from Coastal staff this has been dropped.

EXHIBIT 14
CC-016-13
Caltrans Letter

Please let me know when the staff report is available. We look forward to having the chance to bring the project before the Commission in the effort to obtain the consistency determination so that the safety and operational improvements for this important, existing transportation corridor can move forward. If you have any questions or require additional information, please contact me at kim.floyd@dot.ca.gov or at (707) 441-5739.

Sincerely,

KIM FLOYD
Project Manager

Attachments
1. AADT Eureka-Arcata U.S. 101 Corridor (2008-2011)
2. Eureka Arcata 2011 updated LOS
3. Evaluation Traffic Impacts November 2005
4. Evaluation Traffic Impacts Addendum
5. Two Signal Corridor
6. Mitigation/Restoration Response

c: Robert Merrill - North Coast Coastal Commission Office w/enclosures
César Pérez – FHWA w/out enclosure
Marcella Clem – HCAOG w/out enclosure

Wetland Impacts for Boulevard with Signals Airport Rd to Bayside Cutoff

Permanent Wetland Impact Estimate						
	Wetlands west of highway (acres)		median wetlands (acres)		Wetlands east of highway (acres)	
Sheet	ACOE (3-parameter)	Coastal (<3-parameter)	ACOE (3-parameter)	Coastal (<3-parameter)	ACOE (3-parameter)	Coastal (<3-parameter)
1			0.07			
2						
3	0.02		0.25		0.06	
4				0.09	1.01	
5			0.46			
6			0.23		1.06	0.15
7			0.58		0.45	0.24
8			0.84		1.10	
9						
10			0.64		0.75	
11			0.38		0.36	0.54
12			0.75		1.20	
13	0.10		0.30		0.44	
14	0.03				0.06	
15			0.32		0.18	0.25
16			0.38		0.82	
17			0.04			
18	0.01		0.35	0.01		
19			0.12			
20			0.48		0.03	
21						
22						
23						
24						
25						
26						
27						
28						
29						
Totals	0.16	0.00	6.19	0.10	7.52	1.18

Impacts Common to All Alternatives North of Jacoby Creek Bridge:
No additional drawings attached.

Total Permanent Wetlands Impacted (3-Parameter)	13.87	acres
Total Permanent Wetlands Impacted (Coastal <3-Parameter)	1.28	acres
Total Coastal Wetlands Permanently Impacted	15.15	acres

EXHIBIT 15
CC-016-13
Caltrans Chart
Blvd./Wetlands

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: **KIM FLOYD, P.E.**
Project Manager
District 1 Office of Project Management

Date: July 17, 2012

File: Hum 101
PM 79.8/85.8
Eur/Arc Corridor

From: **TROY A. ARSENEAU, P.E., T.E., PTOE**
Chief
District 1 Office of Traffic Operations

Subject: Traffic Operational Response to Draft CA Coastal Commission Staff Recommendation Document—Eureka-Arcata Corridor Project

In response to the draft California Coastal Commission (CCC) Staff Report to the Commission regarding the Coastal Permit for the Eureka-Arcata Corridor project, the District 1 Office of Traffic Operations conducted additional analysis comparing the impacts of the Modified 3A (preferred) or "NEPA 404 Least Environmentally Damaging Practicable Alternative (LEDPA)" alternative (interchange at Indianola Cutoff, half signal at Airport Road, and median closures) to a "signalized boulevard" alternative (six signalized intersections). Our results from our analysis and comments regarding the CCC document are indicated below.

1. The District 1 Office of Traffic Operations after completing a traffic operational analysis has concluded that a "signalized boulevard" alternative would <u>not</u> be the LEDPA. The "signalized boulevard" analysis used the same criteria applied to all alternatives analyzed. The following conclusions were arrived at by our traffic operations engineers.

   A. Our analysis indicated that a "signalized boulevard" alternative would not be as effective in improving safety and operations in the Eureka-Arcata U.S. 101 Corridor as would the preferred alternative.

      Per the <u>Fundamentals of Traffic Engineering, 14th Edition</u>, Institute of Transportation Studies of the University of California-Berkeley, 1996, Page 17-1, the disadvantages of signal installations are: *"(1) Most installations increase total intersection delay and fuel consumption, especially during off-peak periods, (2) Probable increase in certain types of accidents (e.g., rear-end collisions), (3) When improperly located, cause unnecessary delay and promote disrespect for this type of control, and (4) When improperly timed cause excessive delay, increasing driver irritation."*

      A "signalized boulevard" alternative would not be as effective in reducing the total number of traffic collisions (Please refer also to the Traffic Safety memo by

EXHIBIT 16
CC-016-13
Caltrans Traffic Operations Memo

Ralph Martinelli, dated June 28, 2012.), and the broadside (right angle) collision concern would not be eliminated by signal control. Interchanges remove crossing conflicts, which greatly reduces or eliminates the potential for broadside collisions from an intersection because all movements on and off the highway (mainline) then are only involving right-in and right-out movements (diverging and merging conflict points). Signalized intersections often cause an increase in rear end collisions, especially on the higher volume mainline street that likely did not have stop control prior to the signal installation. Broadside collisions are not eliminated at signalized intersections because travelers do not always obey the traffic signals or simply try to race through the intersection at the end of yellow time or early beginning of red time. Since broadside collisions involve more fatalities and injuries than other types of collisions, properly designed interchanges tend to experience far less severe injury and fatal collisions than signalized intersections due to the almost total elimination of the more severe broadside collisions. Please refer to the Traffic Safety memo, mentioned above, for more information regarding collision frequency and severity comparisons between the two types of intersection controls.

A "signalized boulevard" alternative would not improve traffic flow in the corridor as it would actually cause an increase in congestion on U.S. 101 by introducing six new traffic signals and new cumulative travel delay to U.S. 101 not currently experienced by drivers. The preferred alternative would have much less negative operational impact to U.S. 101 and minor street traffic. Under a "signalized boulevard" scenario, US 101 traffic (both regional and interregional) traveling through signalized network could be forced to stop three or four times at red lights during peak travel times. With the Modified 3A/preferred alternative, traffic on U.S. 101 within the corridor would generally remain free flow, with the exception of interrupted flow at the Airport Road intersection by some movements due to the installation of a half signal at this location.

Per the Traffic Engineering Handbook, 6th Edition, Institute of Transportation Engineers (ITE), 2009, Page 109: "*Traffic characteristics at signalized intersections differ from those on freeways because they are greatly influenced by the periodic interruption of traffic signals. Such control…precipitates and governs the formation and discharge characteristics of queues…*" While the corridor, which is categorized as an expressway, will not be categorized as a freeway once an interchange at Indianola Cutoff is constructed, it will continue to have several characteristics that are common to freeways. Freeways have the advantage of not having to stop mainline traffic. Drivers in the corridor currently enjoy this advantage, with the exception of mainline left turning vehicles that have to yield to opposing traffic before executing their maneuvers.

Another major disadvantage to a "signalized boulevard" alternative would be in facilitating pedestrian traffic across U.S. 101 mainline. In the District 1 Traffic

Operations modeling effort, it was assumed that pedestrians would be allowed to cross U.S. 101 mainline at the Indianola Cutoff intersection, with only one cross walk crossing U.S. 101 being allowed at the intersection. Under this scenario, mainline traffic delay was found to be greatly increased by each pedestrian call due to the large pedestrian crossing distance. Ideally, pedestrians would only cross one direction of U.S. 101 at a time, make an additional pedestrian call (push the pedestrian button) once in the median pedestrian refuge area for the crossing of the opposing mainline travel lanes, and then wait for the next pedestrian phase to occur to finish crossing the highway.

Challenges would exist by having a raised pedestrian refuge in the U.S. 101 median because of the speeds on mainline U.S. 101. Per the Highway Design Manual, Sixth Edition, California Department of Transportation, Index 405.4 (2), "On facilities with speeds over 45 mph, the use of any type of curb is discouraged," meaning that a raised pedestrian island in the median would not be desirable and less likely to be deemed "acceptable" by Caltrans Headquarters geometrician and traffic liaisons.

Not having a raised pedestrian refuge island would place pedestrians at considerable risk of being struck by vehicular traffic. This would force the need to have a long enough pedestrian phase (about 45 seconds) to ensure that pedestrians could cross both directions of mainline traffic causing considerable delay to mainline traffic. Our engineering analysis used the pedestrian walking speed of 3.5 feet per second as recommend by the California Manual on Uniform Traffic Control Devices, 2012 Edition, California Department of Transportation, Page 948, and required by Caltrans Traffic Operations Policy Directive 12-01, dated March 30, 2012.

B. A "signalized boulevard" alternative would have greater wetland impact than the preferred alternative. A "signalized boulevard" alternative and the preferred alternative were modeled in Synchro Version 7.0 traffic analysis software by our traffic operations engineers, and design drawings were created to determine the wetland impact. A signalized alternative would require the removal of approximately 15 acres (as calculated by Project Engineer, Todd Lark using the wetland mapping approved by Coastal Commission staff Dr. Dixon) of wetlands as opposed to the approximate 9.7 acres of wet lands that the preferred alternative would remove. This is a ratio of about 3 to 2, "signalized boulevard" alternative to preferred alternative. A "signalized boulevard" alternative would require more highway widening due to the need for additional through and turning/acceleration/deceleration lanes to maintain LOS C performance at the signalized intersections. A "signalized boulevard" alternative would require four northbound through travel lanes and three southbound through travel lanes. Single left turn lanes would be required at all intersections with dual left turn

lanes being required for southbound U.S. 101 left turning traffic at the Indianola Cutoff intersection.

A "signalized boulevard" alternative would have greater air pollution/greenhouse gas and energy consumption impacts than the preferred alternative. This was determined by our traffic operations engineers using Synchro Version 7.0 traffic analysis software that indicated that the signalized alternative would create about 1.2 times the amount of carbon monoxide (CO), 1.2 times the amount of mono-nitrogen oxides (NO_x), and 1.2 times the amount of volatile organic compounds (VOC) as opposed to the preferred alternative. The software also indicated that a "signalized boulevard" alternative would have 1.2 times the fuel consumption of the preferred alternative, and the preferred alternative would have about a 1.2 times fuel economy advantage over the "signalized boulevard" alternative.

Our traffic operations engineers calculated the potential future electrical power usage at the Indianola Cutoff intersection for signalized at-grade intersection control verses an interchange. A signalized intersection would use about 7 times the kilowatt energy in a 24-hour period than would be required for an interchange. Signalized intersections consume energy from traffic signal operations and intersection lighting at night, while interchanges only require intersection and ramp lighting during nighttime hours. By adding the additional power that would be required for the other five signalized intersections in the signalized alternative, the difference in energy consumption between the two alternatives has a far greater margin verifying that the preferred alternative would require far less energy use than a "signalized boulevard."

C. A "signalized boulevard" alternative would very likely also cause some diversion of a portion of the traffic volume on U.S. 101 to parallel routes (State Route 255 and Old Arcata Road). The potential negative impacts associated with diversion of U.S. 101 traffic to parallel corridor routes has long been a concern of many local individuals, groups, and government entities throughout the project's history.

Studies have indicated that the installation of traffic signals often causes some traffic from the major street (or mainline) to divert to inadequate alternate routes. This can partially be attributed to the driver perception that the new traffic signals cause more delay than would be on the alternate route, whether this is an actual truth or not. Other drivers simply prefer to avoid traffic signals even if the alternate route gives them a longer travel time. Historically, our traffic operations engineers have observed various decreases in traffic volumes on the state highway immediately following the installation of new signals at various locations in the district. It is highly probable that this same phenomenon would occur in the Eureka-Arcata Corridor if six new traffic signals were installed on U.S. 101 in the "signalized boulevard" scenario.

It should be noted that although the 2002 installation of the interim Safety Corridor on U.S. 101 in the Eureka-Arcata Corridor did not include the installation of traffic signals, the reduced speed limit, enhanced California Highway Patrol (CHP) radar enforcement, and other features did influence a noticeable number of drivers to use State Route 255 in lieu of driving through the Safety Corridor, as was evidenced in the recorded rise in traffic volumes on State Route 255 (about 20% over 8 years). While the legislation that established the enhanced CHP radar enforcement in the corridor has since expired, it is believed that the presence of the remaining Safety Corridor features (50 mph speed limit, speed radar feedback signs, special signage, etc.) still influences some overall diversion to State Route 255 even to the present day.

2. Upon review of the draft CCC Staff Recommendation document, we make the following comments:

   A. On Page 2, in the second paragraph, the statement is made, "*The project would increase the highway capacity by removing the major impediment to traffic flow along this stretch of Route 101, which is the non-signalized intersections.*"

   This statement is flawed for the following reasons:

   Per our District 1 Traffic Operations engineering review, the preferred alternative will **NOT** increase the highway capacity. The project is not a capacity-increasing project because the project is not adding additional supply, or travel lanes, to the overall system. When the project is completely constructed, there will be two lanes of northbound traffic and two lanes of southbound traffic the same as it is today. No additional regular free-flowing travel lanes will be added to U.S. 101. The construction of an interchange does not increase the capacity of a highway segment as highway capacity is influenced mostly by supply on the mainline, the total number of lanes. While the interchange will no longer require vehicles entering the highway from the minor streets to have to stop (but will have to yield upon entering U.S. 101) as they will be able to merge onto the highway at the interchange, the interchange will not increase highway capacity on either U.S. 101 or the minor streets. No new additional supply or travel lanes will be added to any of the minor streets or to U.S. 101; therefore, the project cannot be considered to be capacity increasing.

   Secondly, the statement erroneously states that the existing unsignalized intersections in this stretch of U.S. 101 are major impediments to traffic flow. Through traffic on mainline U.S. 101 is **NOT** impeded by the unsignalized intersections in the corridor because it is free flowing, with stop sign control only being in place on the minor streets connecting with U.S. 101 in the corridor. The only mainline traffic movement with restrictions are the mainline left turn

movements (which currently experience poor LOS) to the minor streets which require that the left turning vehicles yield to on-coming mainline traffic (traveling in the opposite direction) before completing their maneuver.

B. On Page 2, in the third paragraph, Coastal Commission Staff recommends that the Commission find that the project does not represent the LEDPA and that the staff believes that a signalized boulevard approach, previously rejected by Caltrans is feasible and less environmentally damaging.

   The District 1 Traffic Operations Office does not concur with the assessment that a "signalized boulevard" is feasible or that it is less environmentally damaging for the reasons stated above in Sections 1 of this memo.

C. On Page 2, in the fifth paragraph, the statement is made that staff recommends the Commission find the project inconsistent with the public access and recreational policies of the Coastal Act because it does not include a separated (by guard rail) bicycle and pedestrian path components.

   We do not agree with this statement. There does not seem to be an example elsewhere in the state where the Coastal Commission required an interchange project to construct a separated bicycle/pedestrian facility parallel to an expressway or freeway segment as a condition of issuing a coastal permit. There was no such separated bicycle/pedestrian facility requirement by the Coastal Commission for the recently completed Alton Interchange project at the junction of U.S 101 and State Route 36, south of the City of Fortuna. Collision records in the Eureka-Arcata corridor did not and currently do not indicate a major significant pattern of either bicycle or pedestrian collisions that would indicate a need for creating separated facilities for bicycle/pedestrian traffic within the corridor. In addition, bicycle and pedestrian volumes remain relatively low in comparison to motorized traffic volumes in the corridor, and existing shoulders along the highway provide space for bicyclists and pedestrians to traverse the highway outside of the travel lanes.

   A statement was also made indicating that the project will "speed up" traffic and make it less safe for bicyclists and impact the bicycle trips length. This statement is incorrect because the project geometrical improvements, in themselves, will not cause an increase in vehicular speed on U.S. 101. In addition, speed limits are determined in a separate process, which is mandated by the California Vehicle Code and the California Manual on Uniform Traffic Control Devices (CAMUTCD).

   While the closure of medians at some intersections may slightly increase bicycle trip length, depending upon the specific origin and destination of each cyclist, overall through trip travel times on mainline U.S. 101 would not increase because

the mainline will remain free flow. The only exception to this would be for northbound mainline traffic having to stop at the Airport Road intersection (controlled by a half signal) during the red phase. Our modeling efforts have indicated that there will be a slight increase in travel time for bicycles on U.S. 101 under the conditions that would be put in place with the preferred project alternative.

D. On Page 3, in the fourth paragraph, statements are made indicating a belief that the construction of an interchange will be growth inducing by itself, and that it may be inconsistent with Section 30254 of the Coastal Act.

While Caltrans experience, in the Intergovernmental Review (IGR) and encroachment permit review processes, has revealed that developers prefer intersections to have a traffic signal control or be controlled by interchanges, the reality of whether or not adjacent lands will be more likely to be developed after any such improvement are constructed, is dependent upon the particular location and the constraints that impact the ability to develop the adjacent land. Many of the same constraints on this project will also be on any development wanting to develop privately owned parcels within the corridor. A coastal development permit would also be required for private development in the corridor.

We also do not believe that an interchange would be more growth inducing than a "signalized boulevard" would be. It is very likely that a "signalized boulevard" would create more developer interest in the adjacent lands along the corridor because traffic would be forced to stop at each at-grade intersection, a highly desirable access and visibility feature to developers wanting to make it easier to attract customers to the new businesses.

E. On Page 13, in the last paragraph (continuing to Page 14), the statement is made, *"The key tests to determine whether the proposed Eureka-Arcata 101 Corridor project qualifies as an incidental public service under these historic interpretations, and thus with the above cited cases and applicable findings, are the questions of whether the proposed improvements are 'necessary to maintain existing traffic capacity' and whether there is 'no other alternative' available that would avoid or reduce wetland impacts. The Commission believes neither of these tests is met in this situation."*

This statement is incorrect because the "signalized boulevard," which has been identified as the alternative that Coastal Commission staff prefers, does not avoid or reduce wetland impacts in comparison to the project's preferred alternative, and all identified alternatives were deemed not viable.

In addition, our modeling has indicated that the "signalized boulevard" alternative would still have poor LOS for all of the left turn movements on the highway and

the minor streets even with the addition of supplemental travel lanes. In reality, the installation of several signals within the corridor would create a decrease of LOS and an increase in delay for all movements on U.S. 101 and the minor streets.

The preferred alternative passes the test as being necessary to maintain existing capacity because the LOS values for the mainline and minor street left turn lane movements continue to worsen as traffic volumes increase with time. The preferred alternative will greatly improve the LOS to the mainline left turn movements and minor streets movements that are reduced because of stop control delay. This improvement to LOS would not increase the overall capacity of the highway but would allow the existing capacities on both the mainline and minor streets to be available for drivers traveling in the corridor. Because the preferred alternative is the LEDPA and the improvements are necessary to maintain existing capacity, the preferred alternative qualifies as an incidental public service.

F. On Page 14, in the second paragraph, the statement is made that *"the Commission does not agree with Caltrans that the resolution of these operational conflicts by eliminating most of the intersections, which also results in speeding up the flow of traffic, thereby increasing highway capacity…"*

This statement is incorrect for the following reasons: (1) the preferred alternative of the project does not eliminate any intersections. While some intersections will be restricted to right-in/right-out only movements, no intersections will be eliminated, (2) There is no evidence that indicates that traffic flow will be sped up significantly beyond the existing speed limit in the corridor as a result of the project, and (3) The preferred alternative will not increase highway capacity as no new travel lanes are being added to the corridor (The facility will remain a four-lane divided highway.).

G. On Page 15, in the second paragraph, the statement is made that *"inherently that Caltrans' solution is one which has the effect of increasing, rather than maintaining, highway capacity. The various intersection closures and increased acceleration and deceleration lanes intended to increase this capacity…"*

This statement is incorrect. The addition or expansion of acceleration and deceleration lanes as part of the preferred alternative of the project does not increase the overall highway capacity of the corridor. The acceleration and deceleration lanes serve only to more safely facilitate merging and diverging traffic (traffic weaving) while helping to maintain existing highway capacity by improving level of service. As also was stated before in Item F above, no intersections will be closed by the project, and the highway will remain a four-

lane divided highway upon completion of the project. The project will not increase the highway capacity of the corridor.

H. On Page 15, in the fourth paragraph, the statement is made that *"Upgrading the intersections, which are the primary bottlenecks in this stretch of Route 101, from the current LOS E (and projected to be F in 2030) during peak periods, to LOS C will have the effect of increasing highway capacity."*

This statement is incorrect for the following reasons: (1) The existing intersections in the corridor are stop controlled intersections where mainline highway traffic is free flow (does not have to stop); therefore, the existing intersections are not bottlenecks on the existing highway, and (2) Increasing the LOS to either specific intersection movements or the overall intersection LOS does not increase the overall highway capacity of the corridor. Upgrading or improving the performance of an intersection in the corridor will not increase the highway capacity of U.S. 101 because the facility will remain a four-lane divided highway once the project is completed.

I. On Page 16, in the second paragraph, the statement is made that *"the proposed project would increase the capacity at the Indianola Road and Highway 101 intersections, and in so doing, the carrying capacity of the Highway 101 corridor itself…"*

This statement is incorrect for the following reasons: (1) While an interchange at U.S. 101 and Indianola Cutoff will better facilitate left turn movements on both the highway and minor street, the overall highway capacity of the U.S. 101 corridor or any of the minor streets connecting to the corridor will not increase. Again, the proposed project is not a capacity-increasing project because it is not increasing the supply by adding additional travel lanes as would be the case if the project would be converting the four-lane divided highway into a six-lane divided highway.

J. On Page 27, in the second paragraph, the statement is made that *"…It is unfortunate that Caltrans did not include a level of service analysis of a signalized alternative in a manner comparable to the other "build" alternatives did examine in detail, because, for the reasons discussed in the previous section of this staff report, a signalized alternative may be the only alternative (other than the No-Build alternative) that could be found consistent with the allowable use test of the Coastal Act wetlands policy…"*

Regardless of whether or not a detailed LOS analysis was previously performed for a "signalized boulevard" alternative, such an alternative never was and ever will be a very viable alternative due to the following reasons: (1) Additional lanes would be required to make the signalized intersections work at acceptable level of

service which causes this alternative to have greater wetland impact than most of the alternatives identified in the project study report; (2) Not all of the intersections would be viable candidates for traffic signalization due to most not meeting traffic signal warrants; (3) Signalizing the corridor would introduce congestion and delay not currently experienced in the corridor, (4) The spacing between intersections does not allow for very efficient traffic signal coordination, and (5) Signalizing the corridor would not remove the crossing conflicts at each intersection, which has led to numerous occurrences of broadside (right-angle) collisions.

K. On Page 28, in the fourth paragraph, the statement is made that "*the Commission strongly disagrees with the Caltrans position that adding signals would be growth-inducing, and that the proposed alternative designed specifically to improve traffic flow and accommodating 30% increase in traffic would not. Certainly no evidence has been provided to suggest that signalizing the intersections along this stretch would increase the capacity of U.S. 101.*"

This statement is flawed for the following reasons: (1) Neither adding traffic signals nor installing an interchange would necessarily be growth-inducing within the corridor, by themselves, because of the existing environmental and physical limitations of the privately-owned lands adjacent to U.S. 101. Both types of intersection treatments can potentially encourage growth, but neither can necessarily induce growth unless other factors are in play, such as the presence of privately-owned land that can be feasibly zoned and developed; and (2) Adding additional lanes for a "signalized boulevard" alternative in order to bring level of service of mainline to acceptable levels would not be capacity-increasing. The additional lanes would function only to restore loss of LOS that the traffic signals would cause due to mainline traffic flow transforming from uninterrupted flow to interrupted flow. For both options, the capacity on U.S. 101 would not increase because the facility would basically remain a four-lane divided highway with additional lanes added only to push through hourly traffic past the signalized intersections, six intersections in the case of a "signalized boulevard" alternative and one signalized (half signal) intersection in the case of the preferred alternative, without having uncontrollable traffic queues that would gridlock the corridor during peak periods.

An important thing to note also is that the freeway entering Eureka to the south and the freeway entering Arcata from the U.S. 101 Eureka-Arcata corridor north to the freeway segment in Arcata will remain four-lane freeway segments after the project is constructed, regardless of what alternative is selected. This project will not increase the highway capacity of the existing freeway segments to the south and to the north, nor will it increase the segment highway capacity between the southern and northern freeway segments (U.S. 101 through Eureka and U.S. 101 through the Eureka-Arcata Corridor).

L. On Page 28, in the fourth paragraph, the statement is made that, *"It is unclear the degree to which signalized intersections would increase greenhouse gas emissions and air quality impacts, and reduce energy efficiency. Caltrans has not provided sufficient analysis to enable any quantification or weighing of this factor against other coastal resource impacts, such as wetland fill. Highway proponents before the Commission have routinely made the argument that building and widening highways is inherently energy efficient because it reduces traffic congestion. The Commission's experience has generally been that new and widened highways bring growth and attract traffic, to the degree that they eventually reach congestion conditions, thereby minimizing these purported benefits."*

In response to this statement, (1) Our recent Synchro Version 7.0 analysis of the "signalized boulevard" alternative and the preferred alternative has indicated that about 20% more greenhouse gases would be produced by the "signalized boulevard" alternative as was noted in Section 1B of this document; (2) The preferred alternative of this project will not create a new highway, and the widening that will occur is minimal. While level of service will be improved for left turn movements from the highway and the minor streets, no additional highway capacity will be added. This project is neither a congestion reducing nor a capacity-increasing project.

M. On Page 29, in the first paragraph, the statement is made that *"the project DEIR/S notes that 'Pedestrian use on Route 101 is infrequent from Airport Road northward.' Caltrans has not provided a comparison of pedestrian opportunities and limitations between the proposed project and a signalized alternative."*

In response to this statement, it should be noted that the preferred alternative would maintain the existing accessibility for pedestrians, while adding an ability for pedestrians to use the overcrossing at the Indianola Cutoff interchange to cross U.S. 101 while being "grade-separated" from mainline traffic, a feature that does not currently exist. The "signalized boulevard" alternative was modeled with a single pedestrian crossing at the Indianola Cutoff intersection as Indianola Cutoff has the highest minor street traffic volume within the corridor. It would not be appropriate to allow pedestrians to cross U.S. 101 at each intersection in the corridor. As was noted earlier in this document, by allowing a pedestrian phase at Indianola Cutoff, traffic on mainline would be required to stop for about 45 seconds every time a pedestrian push button was activated. Also noted earlier in this document, it would not be practical to provide a raised pedestrian refuge island in the median due to speeds on the highway exceeding 45 miles per hour, so pedestrians would have to be given enough time to safety cross both directions of traffic on U.S. 101. Our modeling has indicated that each activated pedestrian phase will cause significant delay for motorists traveling on U.S. 101 through this

intersection. This delay would not exist with the preferred alternative, where pedestrians would be allowed to cross the highway using the grade-separation bridge at the Indianola Cutoff interchange.

N. On Page 29, in the second paragraph, the statement is made that, "*the Commission finds that while it may entail some degree of wetland fill, a signalized "boulevard" alternative that the Commission staff previously requested Caltrans to consider (in the Commission staff's DEIR/S comment letter dated Sept. 28, 2007) should be considered the least environmentally damaging feasible alternative. The Commission finds that given the evidence available to date, such an alternative would not increase highway capacity and would be eligible as an allowable use under Section 30233(a) of the Coastal Act. It would also likely involve fewer wetland impacts, fewer visual impacts (compared to the proposed Indianola Interchange), more opportunities to improve non-motorized transit, fewer growth-related concerns, and would be more compatible with the character of the area than the proposed project. The Commission therefore concludes that the proposed project is not the least environmentally damaging feasible alternative and is therefore inconsistent with the alternatives test of Section 30233(a) of the Coastal Act.*"

   In response to this statement, we conclude that the "signalized boulevard" alternative is not the LEDPA because it will require the removal of approximately 15 acres of wetland, it will produce more greenhouse gases, and it will require more electrical energy use within the corridor. The "signalized boulevard" alternative would not be as effective in improving safety and would increase congestion rather than reduce it. For the reasons stated in Section 1 and elsewhere in this memo, we disagree with Coastal Commission staff in their assessment that the preferred alternative does not meet the alternatives test of Section 30233 (a) of the Costal Act.

O. On Page 37, in the third paragraph, the statement is made, "*Concerns have been raised that the proposed Indianola Interchange would increase traffic capacity in the rural area that surrounds it. This area contains important wetland and agricultural uses and lack sewer and road capacity of more intensive urban (and non-Coastal Act priority) uses.*"

   This statement is not correct in that it is impossible for any interchange, by itself, to increase traffic capacity in the area that surrounds it. While an interchange would improve the LOS of left turn movements both from and to U.S. 101, an interchange would not increase the segment highway capacity of either U.S. 101 or Indianola Cutoff.

P. On Page 40, Provision Item #1 requires Caltrans (1) to "*permanently retain a speed limit of not more than 50 mph in the subject four-mile section of U.S. 101*

and (2) *consider coordinated speed controls/reductions on inter-tied corridors (Highway 255 and Old Arcata Road, for example)."*

These "mitigation" requirements are not viable options, are beyond the scope of the project, and/or are located on roadways not within the jurisdiction of the State.

The first condition to retain a maximum speed limit of 50 mph cannot be established without proper engineering justification under existing California law if the speed limit is to be enforceable by the CHP or local law enforcement. Per Section 2B.13 of the California Manual on Uniform Traffic Control Devices, 2012 Edition, Paragraph 01: *"Speed zones (other than statutory speed limits) shall only be established on the basis of an engineering and traffic survey (E&TS) that has been performed in accordance with traffic engineering practices. The engineering study shall include an analysis of the current speed distribution of free-flowing vehicles."* As conditions will change within the Eureka-Arcata Corridor upon completion of this project, future speed limit requirements will be subject to potential change when future E&TS's are completed for this segment of highway. Future E&TS's could indicate higher or lower speed limits based upon the calculated 85th percentile speed.

The second condition to require the project to consider coordinated speed controls/reductions on inter-tied corridors is well beyond the purpose and need of this project. Also, no segments of State Route 255 or Old Arcata Road are or have ever been included within the project limits.

Q. On Page 40, Provision Item #2 requires Caltrans to "*install at-grade traffic lights dependent on emerging 'Intelligent Traffic Management Technology' to facilitate optimal flow of traffic…"*

For reasons stated elsewhere in this memo, a "signalized boulevard" is not a feasible project alternative.

R. On Page 40, Provision Item #3 requires Caltrans to "*install a guard-rail separated bicycle/pedestrian corridor on one or both sides of the highway…"*

This "mitigation" requirement is beyond the purpose and need of this project.

Should you have any questions regarding these comments, please contact me at: 445-6377.

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: KIM R. FLOYD, Project Manager
District 1 Office of Project Management

Date: June 28, 2012

File: HUM-101-PM 79.8/85.8
EA 01-366000
Eureka-Arcata Corridor
Improvement Project

From: RALPH M. MARTINELLI, Chief
District 1 Traffic Safety Office

Subject: **Issue Paper: Safety Analysis of Signalization at Indianola Cutoff/Route 101**

The District 1 Traffic Safety Branch has performed a safety analysis of a full signal at the Route 101 and Indianola Cutoff intersection. Our analysis compared the statewide average number of collisions for 3 alternatives (Interchange, signals, no-build) using average daily traffic (ADT) projected out to the design year of 2040. Also investigated was the existing performance of similar signalized intersections on rural expressways in Northern California. Safety performance information/statistics were also obtained from various research reports, NCHRP Report 500, as well as from traffic engineering professionals in the Caltrans Division of Traffic Operations: Robert Peterson, Branch Chief of the Highway Safety Improvement Program, Craig Copelan, Branch Chief of Traffic Safety Studies, and Thomas Schriber, Traffic Liaison Engineer to Districts 1,7,8, and 9.

BACKGROUND AND HISTORY

Caltrans, in cooperation with Humboldt County Association of Governments (HCAOG) and state and local law enforcement agencies, implemented the Eureka-Arcata Route 101 Safety Corridor as a temporary measure to reduce the high intersection collision rates on the expressway portion of Route 101 between Eureka and Arcata. Although monitoring data at most locations since May 19, 2002 indicates a significant reduction in total, fatal plus injury (F+I), and fatal collisions for the intersections, the Safety Corridor was intended as an interim solution. It has not solved the concern over significantly high total and F+I collision rates at the intersections of greatest concern, Mid-City and Indianola Cutoff. At Mid-City, the total and F+I collision rates are 1.6 and 2.0 times the statewide average, respectively. At Indianola Cutoff, the total and F+I collision rates are 1.9 and 1.7 times the statewide average, respectively.

Since its inception in 2002, the number of collisions has increased on the ancillary routes, SR-255 through the community of Manila and Old Arcata Road. Traffic volumes have increased by 20% over eight years on SR-255, while decreasing slightly on Old Arcata Road. As noted above, the collision rates at Mid-City and Indianola Cutoff remain higher

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than the statewide average while the at-grade intersections within the corridor remain open to uncontrolled cross-median traffic. Together with HCAOG, it is the intent of Caltrans to develop and maintain a safe and efficient transportation facility that includes improvements utilizing the latest design standards.

Route 101 Corridor improvements between Eureka and Arcata have historically been an important priority of both Caltrans and HCAOG. In response to HCAOG, Caltrans developed a Project Study Report (PSR), which documented the existing and projected future needs and began the alternative development process that would identify strategies to improve safety and highway operations within the Route 101 corridor. In addition, an iterative value analysis (VA) process and a Supplemental PSR were completed to further develop the range of project alternatives. In May 2003 the two build and the No-Build Alternatives were presented to the public. At that time, a group of individuals representing businesses within the Route 101 corridor made presentations to HCAOG regarding concerns about adverse impacts to their businesses as a result of median closures. Consequently, HCAOG requested Caltrans to evaluate alternatives that included signalization of Route 101 at Airport Road. Thus, a third build alternative was developed, which consists of the same project elements as Alternative 2 but with an addition of a signal at Airport Road.

Alternatives generated by the PSR and VA process also must meet the requirements of the NEPA/404 Integration Memorandum of Understanding (MOU). This MOU requires that Caltrans and the FHWA obtain formal concurrence from various federal agencies on the stated need and purpose of the project as well as the range of alternatives developed. The project need stated in the April 2006 concurrence request letter is to reduce the number of injury and fatal collisions at intersections along the corridor. These at-grade intersections have been the site of numerous collisions resulting in property damage, serious injuries and fatalities. The primary purpose stated is to improve safety by improving how traffic enters and exits U.S. 101 at intersections along the corridor. The signatory agencies have provided their concurrence on the current range of alternatives, which includes Alternatives 1 through Mod 3A and the No-Build.

PREFERRED ALTERNATIVE

Modified Alternative 3A was approved as the Preferred Alternative by HCAOG in June 2009. In general, it includes:

- Half-signal at Airport Road, stopping northbound 101 traffic only, and providing for southbound and westbound left-turns.
- Construct compact diamond interchange at Indianola Cutoff, with steepened slopes (1.5:1) and narrower median (22').
- Close median crossings at Mid-City Motors, Arcata Redwood, Bracut, and Bayside Cutoff intersections.
- Lengthen right side acceleration and decelerations lanes at each of the existing access locations (except Airport Road).

- Construct a third northbound lane from Cole Avenue to Mid-City Motors.

Modified Alternative 3A meets the Safety Conformance Criteria defined for the project.

COMPARISON OF STATEWIDE AVERAGE NUMBER OF COLLISIONS: Interchange, Signals, and No-build

Statewide average collision rates were calculated using highway segment, intersection, and ramp rate groups, base rates, and ADT factors as specified in Highway Safety Improvement Program (HSIP) Guidelines, dated 12/22/09. Statewide average rates, when multiplied by a projected yearly vehicle travel, yield the statewide average number of collisions per year for that facility. Table 1 below contains the number of collisions for the 3 alternatives at Indianola Cutoff: Interchange, Signal, and No-build.

TABLE 1- Comparison of Statewide Average Number of Collisions for Indianola Cutoff
(Design Year 2040, Projected Mainline ADT 51,700 VPD)

	Number of Collisions Per Year			
Alternative	Total	Fatal	Injury	F+I
Interchange	10.81	0.09	3.47	3.56
Signal	19.64	0.18	7.18	7.37
No-build	16.56	0.16	5.99	6.15

Conclusions:

- For Total collisions per year, an interchange will have 55% the number of a signalized intersection.
- For F+I collisions per year, an interchange will have 48% the number of a signalized intersection.
- For Fatal collisions per year, an interchange will have 50% the number of a signalized intersection.
- From a collision standpoint, the No-build will have fewer collisions than the signal alternative.

PERFORMANCE OF EXISTING LOCATIONS IN NORTHERN CALIFORNIA

For comparison only, the performances of eleven northern California signalized intersections were surveyed. The intersections were selected to be comparable in terms of traffic volumes, approach conditions and roadside environments. Following are the results:

Table 2

Collision Rates 1/01/2006 Through 12/31/2010
Signalized Intersections on Various Routes in District 3
Facility Type: 4-Lane Rnral Expressway

Intersection	County	Rte	PM	Severity	Collision Rates[1] Actual	State Avg	% of State Avg
Township Road	Sutter	20	12.670	Fatal	0.000	0.005	**0 %**
				Fatal + Injury	0.32	0.22	**145 %**
(1st signal EB)[2]				Total	0.64	0.60	**107 %**
George Washington Blvd	Sutter	20	13.600	Fatal	0.000	0.002	**0 %**
				Fatal + Injury	0.29	0.19	**153 %**
				Total	0.51	0.55	**93 %**
Harter Road	Sutter	20	14.470	Fatal	0.000	0.002	**0 %**
				Fatal + Injury	0.17	0.11	**155 %**
				Total	0.21	0.30	**70 %**
Sunset Blvd	Placer	65	R9.569	Fatal	0.000	0.005	**0 %**
				Fatal + Injury	0.33	0.22	**150 %**
				Total	1.05	0.60	**175 %**
Elverta Road	Sacto	99	35.370	Fatal	0.013	0.005	**260 %**
				Fatal + Injury	0.25	0.22	**114 %**
(1st signal NB)[2]				Total	0.64	0.60	**107 %**
Riego Road	Sutter	99	0.950	Fatal	0.000	0.005	**0 %**
				Fatal + Injury	0.28	0.22	**127 %**
				Total	0.56	0.60	**93 %**
Barry Road	Sutter	99	26.120	Fatal	0.028	0.002	**1400 %**
				Fatal + Injury	0.30	0.19	**158 %**
(1st signal NB)[2]				Total	0.39	0.55	**71 %**
Bogue Road	Sutter	99	27.650	Fatal	0.000	0.002	**0 %**
				Fatal + Injury	0.44	0.19	**232 %**
				Total	0.96	0.55	**175 %**
Lincoln Road	Sutter	99	28.670	Fatal	0.016	0.002	**800 %**
				Fatal + Injury	0.25	0.19	**132 %**
				Total	0.90	0.55	**164 %**
Estates Drive	Butte	99	28.360	Fatal	0.000	0.003	**0 %**
				Fatal + Injury	0.20	0.11	**182 %**
(1st signal NB)[2]				Total	0.34	0.30	**113 %**
Entler/ Southgate	Butte	99	29.367	Fatal	0.000	0.005	**0 %**
				Fatal + Injury	0.14	0.22	**64 %**
				Total	0.38	0.60	**63 %**

Notes: 1. Collisions per million vehicles. Reference Traffic Accident Surveillance and Analysis System (TASAS) Table B Selective Accident Rate Calculations for intersection locations.

2. "1st signal ..." means it is the first signalized intersection in a series of multiple signals after a significant length of uncontrolled high-speed freeway or expressway. The first signal in a series has the highest

approach speeds and could be a surprise to a driver who is not noticing the advance warning systems in place.

Conclusions:

- First signals (i.e., Isolated signals) all have higher F+I rates than expected.
- 2 of 3 high fatal rate locations are first signals. The 3rd location (Lincoln Road) has ADT comparable to Indianola.
- Highway segments with multiple signalized intersections experience high levels of injury accidents.

COLLISION REDUCTION STRATEGIES, TREATMENTS AND COUNTERMEASURES

To achieve the Safety Conformance Criteria defined for the project, i.e. the reduction in severity of collisions in the Eureka-Arcata Safety Corridor, careful application of additional safety strategies for a signal at Indianola Cutoff would need to be added to the scope of work. Many of these features exist at the signalized intersections identified in Table 2, yet still the safety performance is degraded.

In general, there are three main areas where reduction in fatalities and injuries from collisions at signalized intersections may be achieved:

- Sound Traffic Engineering
- Sustained and Effective Education and Enforcement Measures
- Well-designed facilities

Sound Traffic Engineering--The following excerpt from FHWA's *Signalized Intersections: Informational Guide* (FHWA-HRT-04-091) summarizes the key concept of using traffic engineering to provide drivers with effective warning to reduce collision rates: "Approaches are critical components of a signalized intersection. It should be obvious to someone approaching by motor vehicle, bicycle, or on foot that an intersection is ahead, and the traffic control device is a traffic signal. Adequate signing and pavement marking is required to provide the driver with sufficient information to determine the appropriate lane to choose and direction to travel. The pavement on the approaches should provide the driver with a smooth, skid-resistant surface, with adequate drainage. The approaches ideally should meet at right angles and should be at grade and free of unnecessary clutter and obstacles. Sight distance for all approaches should be adequate for drivers proceeding through the intersection, particularly those making a left turn."

The following list of approach treatments is indicative of the many strategies, treatments and countermeasures that would need to be considered in order to encourage successful safety performance of a signal at Indianola Cutoff:

- Provide Advance Warning. These systems are recommended by the MUTCD in cases where the primary traffic control is not visible from a sufficient distance to permit the driver to respond to the signal. Advance warning devices may be an effective countermeasure for: a) rear-end collisions where a driver appears to have stopped suddenly to avoid running a red light and was struck from behind, b) angle collisions caused by inadvertent red light running, and c) queues from a red signal occurring at a location where approaching traffic cannot see it because of a vertical or horizontal curve.

  There are two main types of treatments used to provide advance warning to motorists approaching a signalized intersection. There are those that provide a general warning of a signalized intersection ahead, and those that provide a specific warning of downstream signal status or traffic conditions ahead. Of the first type, typical measures used are static signs and pavement markings ("Signal Ahead"), and continuous flashing beacons with signs that may read "Be Prepared to Stop." Radar-feedback and other interactive dynamic signs may also be included.

  The more specific type of warning may be activated showing yellow flashing lights or illuminating an otherwise blank changeable message such as "Red Signal Ahead" for several seconds. The sign and the flashers are placed a certain distance from the limit line as determined by the speed limit on the approach.

  Another type of potentially effective specific advance warning safety application available is the Queue Detection System. An excerpt from the 2004 NCHRP Report 500 – Vol. 12: *"A Guide for Reducing Collisions at Signalized Intersections"* describes one such system that has been successfully used in Oregon: "Two loop detectors in each lane on the intersection approach detect when a vehicle is stopped at that location. The detectors are connected to an overhead sign with beacons located a half mile upstream. The sign contains the message 'Prepare to Stop When Lights Flash.' When a vehicle is continuously present at a detector, beacons on the overhead sign flash to warn drivers of the stopped vehicle ahead. A preliminary evaluation indicates a reduction in crashes after installation of this system, but additional data are needed to determine if other factors contributed to this decrease. For additional information on this system, refer to the FHWA report *Safety Applications of ITS in Rural Areas,* (Federal Highway Administration, 2002), available online at http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/5_1_1.htm."

Sustained and Effective Education and Enforcement Measures--

1. Education and enforcement programs to increase safety belt usage and decrease drinking and driving, aggressive driving or speeding may help to reduce severe collisions at the intersection. Several enforcement countermeasures that may be effective are:
    - Traditional law enforcement presence.
    - Warning signs for red light and grid-lock vehicle code violations ("$270 fine for violations")
    - Red light camera enforcement, if publicly acceptable.

2. The principles of Human Factors and Positive Guidance can be applied to increase safety at signalized intersections. Much of the previous discussion overlaps with these two principles. A fundamental premise of human factors is that insufficient, conflicting or surprising information reduces both the speed and accuracy of human response. Positive guidance is founded on the following concept, from Chapter 2 of FHWA's *Signalized Intersections: Informational Guide*: "...if drivers are provided with all of the information they need, in a format they can readily read, interpret and apply, and in sufficient time to react appropriately, then the chances of driver error will be reduced, and relative safety will be improved."

Well-designed Facilities--

Preliminary design features and operational characteristics of a signal at Indianola Cutoff are included in separate analyses prepared by North Region Design and District 1 Traffic Operations for a boulevard with signals at 6 existing intersections between Eureka and Arcata. Included are descriptions of lane configurations, roadway widths, wetland impacts, signal phasing, and signal head placement.

MISCELLANEOUS DISADVANTAGES OF SIGNALIZATION

- Signalization would result in increased corridor travel time with resulting diversion to parallel roadways. Potentially, SR-255 could experience a surge of volume increase similar to that following implementation of the Safety Corridor in 2002. (There was an initial 30% increase in volumes on SR-255, as documented in the Safety Corridor monitoring reports to HCAOG.)
- While signal controlled intersections have been demonstrated to reduce the total number of broadside collisions (while at the same time increasing the number of rear-enders),the potential for broadside collisions is not eliminated because prevention still requires driver compliance to traffic signal commands.

- The location of Indianola Cutoff near Humboldt Bay is prone to adverse atmospheric conditions such as dense fog and heavy rain, which can degrade visual signal warning systems and impair motorists' response.
- By adding an isolated signal at Indianola Cutoff, in addition to the half signal planned at Airport Road, there is the expectation that the phenomenon of habituation will leave motorists less aware of a single and specific potential conflict, and reduce the effectiveness of warning systems, and increase the potential for collisions.
- Bicycle access through the signal would be problematic. Both westbound to southbound and southbound to eastbound moves by bikes would require crossing mainline through lanes to access left-turn channelization and may be perilous and disruptive to the mainline traffic stream. Northbound through movements for bikes would conflict with right turning vehicles and merging vehicles turning onto northbound101 from Indianola Cutoff.
- Pedestrians are not prohibited on this expressway. Their presence will likely cause more red signal time for mainline creating longer queues and the potential for rear-end collisions or traffic diverting to SR-255 and Old Arcata Road.
- Multiple safety studies have shown that signalized intersections have higher collision rates than stop-controlled intersections (the No-build Alternative). See References 1-3.
- An excerpt from the NCHRP Report 500, Volume 5, "A Guide for Addressing Unsignalized Intersection Collisions" states that: "Experience shows that intersection collision rates frequently increase with signal installation, although the collisions may be less severe. Signalization usually leads to a shift in collision type, with fewer angle/turning collisions and more rear-end collisions." The report goes on to state: "Signalization should be avoided where practical". See reference 4.
- Collision problems are created by unexpected traffic signals on high-speed rural expressways. See reference 5.
- There is increased frequency and severity of collisions involving trucks at intersections controlled by signals. See reference 6.
- Exhibits in NCHRP Report 500, Volume 12, "A Guide for Reducing Collisions at Signalized Intersections" contains the following statistics:

  --29% of fatal intersection collisions occurred at signalized intersections
  --59% of fatal collisions at signalized intersections involve angle collisions with other vehicles (meaning one of the vehicles ran the red light)
  --there is little difference in severity distribution of collisions (fatal, injury, PDO) between signalized and stop-controlled intersections. See reference 7.

CONCLUSIONS

Signals are not an appropriate traffic control system for an isolated intersection on a rural expressway with high traffic volumes.

Since there is a well documented, continuing safety problem at Indianola Cutoff, collision projections and existing poor performance of similar facilities prove that installing a traffic signal there would not solve the problem. A grade separated interchange will.

Research studies document that signalization increases collision rates and creates problems rather than solving them for isolated locations on high-speed rural expressways. For these reasons, signalization should be avoided where practical.

Additional collision reduction strategies, treatments, and countermeasures for a signal at Indianola Cutoff would need to be added to the scope of work, thereby increasing costs. Many of these features exist at the signalized intersections identified in Table 2, yet still the safety performance is degraded. In addition, advanced warning features such as signs and flashing beacons will likely degrade the aesthetics along Humboldt Bay.

The suggestion of a signalized boulevard is not supported by this office. Many of the disadvantages stated above for an isolated signal at Indianola Cutoff (diversion, broadside collision potential, adverse weather impacts, warning system habituation, bicycle and pedestrian complications, and overall increased collision potential) apply to the idea of multiple signals through the corridor. In addition, the 1st signal condition described on page 5 would still exist for southbound traffic entering the boulevard from the freeway segment of U.S. 101.

If you have any questions or concerns, please contact me at 707-445-6376 or Bob Kornman of my staff at the District 1 Traffic Safety Office, 707-445-6578.

References:

1. David, N.A. and Norman J.R.; "Motor Vehicle Accidents in Relation to Geometric and Traffic Features of Highway Intersections, Volume II—Research Report", Report No. FHWA-RD-76-129, FHWA, 1979
2. Hanna, J.T., Flynn, T.E., and Tyler W.L.; "Characteristics of Intersection Accidents in Rural Municipalities", Transportation Research Board Record 601, 1976
3. Van Maren, P.A.; "Correlation of Design and Control Characteristics with Accidents at Rural Multi-lane Highway Intersections in Indiana", Purdue University, Joint Highway Research Project, July 1980

4. Neuman, T.R., Pfefer, R., and Slack, K.L.; National Cooperative Highway Research Program (NCHRP) Report 500, Volume 5, "A Guide for Addressing Unsignalized Intersection Collisions", Transportation Research Board, 2003
5. Eck, R.W. and Sabra, Z.A.; "Accident Countermeasures at High-Speed Signalized Intersections, Phase I—Synthesis of Practice", Department of Civil Engineering, West Virginia University, August 1984
6. Agent, K.R.; "Results of Study: Traffic Control and Accidents at Rural, High-speed Intersections", University of Kentucky, 1987
7. Neuman, T.R., Pfefer, R., and Slack, K.L.; NCHRP Report 500, Volume 12, "A Guide for Reducing Collisions at Signalized Intersections", Transportation Research Board, 2004

REK/RMM:rek

c:

1. MLSuchanek
2. RMMartinelli
3. REKornman
4. File

1. LRAshley
2. TRLark

1. TAArseneau
2. ESBrunton

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: KIM FLOYD
Project Manager
District 1

Date: June 14, 2013

File: Hum 101
PM 79.8/84.9
Eureka/Arcata Corr.

From: TROY ARSENEAU
Chief, Office of Traffic Operations
District 1

Subject: Traffic Analysis of Two Signal Corridor Scenario

At your request, the District 1 Office of Traffic Operations has performed traffic analysis (requested by the California Coastal Commission) for a two signal scenario in the Eureka-Arcata Corridor for both the anticipated opening day (2018) and the design year (2038). The particulars of this scenario are as follows:

- Full traffic signalization of Indianola Cutoff
- Half signalization of Airport Road (southbound U.S. 101 through, free flow)
- All other corridor intersections with closed medians (right in/out only access)
- Scenarios with and without a 4th northbound through lane on U.S. 101
- Scenarios with and without dual (two) left turn lanes on U.S. 101 and on Indianola Cutoff at the Indianola Cutoff intersection

Traffic Operations performed this analysis using Synchro v8 / SimTraffic v8 and Highway Capacity 2010 Software.

Please refer to Attachment 1 for a summary table of the Level of Service (LOS) and volume to capacity (v/c) ratios for the opening day and design year scenarios in the AM and PM peak periods. Please refer to Attachment 2 for the traffic volume information requested for U.S. 101.

We have listed the volume to capacity ratios in our results table to demonstrate the level of added congestion that signalization at Indianola Cutoff would immediately produce for traffic traveling through the Eureka-Arcata Corridor. We believe that the Indianola

EXHIBIT 18
CC-016-13
Caltrans Issue Paper
2 Signal Scenario

Cutoff intersection is at the volume threshold of where signalization is no longer a practical intersection treatment due to the heavy through and left turn volumes on U.S. 101 and the heavy westbound left turns on Indianola Cutoff during peak periods. While a signal system can be installed with the required additional lanes to optimize the signal timing, such an installation would change the nature of the traffic flow through the corridor transforming it from a rural uninterrupted traffic flow environment to an urban-like interrupted traffic flow environment, due to the levels of traffic delay that will be added to the corridor beginning from Day One when the traffic signals are turned on at Indianola.

The volume to capacity ratio is defined by the Highway Capacity Manual 2010 as: "the ratio of flow rate to capacity of a system element." In other words, it is the percentage of available lane capacity being used by traffic. A v/c ratio greater than 1.0 means that the system is over capacity and has heavy congestion. In a signalized system, traffic that has v/c>1.0 is severely delayed as vehicles have to wait more than one cycle length to make it past the intersection (cycle failure), and severe traffic queues (back ups) develop, further compounding the congestion problem. A v/c ratio between 0.75 and 1.0 indicates heavy congestion, and a v/c ratio between 0.5 and 0.75 indicates a moderate level of congestion. Below 0.5 indicates zero to low congestion.

Opening Day (2018)

Our analysis for an opening day scenario in 2018 indicated that four northbound U.S. 101 lanes, three southbound U.S. 101 through lanes, two southbound U.S. 101 left turn lanes, and two westbound Indianola Cutoff left turn lanes would be required to optimize the performance of a traffic signal at the intersection of U.S. 101 and Indianola Cutoff.

If only three northbound lanes, one southbound left turn lane, and one westbound left turn lane are provided at Indianola, traffic flow in all directions would experience added and undesirable congestion as the traffic signal timing could not be fully optimized to serve the most traffic per cycle length. The v/c ratios for the northbound through and the southbound left turn movements would be approximately 0.78 and 1.40, respectively. The southbound left turn traffic would be severely delayed, requiring two or more cycle lengths to clear the traffic queue in the left turn lane and there would likely be traffic backup spilling into the adjacent southbound through lane as well during peak periods.

Under the same lane restrictions above, the northbound through movement and the southbound left turn movement would have LOS C and LOS F, respectively. Our

modeling effort reinforced the fact, discovered in prior traffic analysis performed by our office, that a fourth northbound through lane, second southbound left turn lane, and second westbound turn lane would be required at Indianola Cutoff in order to make the traffic signal timing as efficient as possible on opening day, minimizing delay experienced by the traveling public.

Design Year (2038)

Our analysis for the design year scenario in 2038 further confirmed that even with four northbound through, three southbound through, two southbound left turn lanes, and two westbound left turn lanes, a signalized intersection at Indianola would function very poorly, indicating a need for a more advanced traffic control treatment than can be provided by traffic signals.

In the design year, the worst traffic movement affected by the signalization of Indianola Cutoff would be the southbound left turn movement as is the case with the opening day. Even with three southbound left turn lanes, our modeling indicated that southbound left turning vehicles stopping during red time at the intersection would not be all served during one cycle length, with several vehicles being required to wait for a second or even third signal cycle before they could make it past the intersection during green time. If green time for the southbound left turn movement is increased to better serve these vehicles, the modeling indicated that the northbound through movement would experience more traffic queuing (traffic backups) and have LOS E or worse.

Our modeling indicated that the two southbound left turn lanes would need to be a minimum of 750 feet in length in order to keep traffic from backing up into the adjacent southbound through lanes.

Airport Road Half Signal

Our analysis indicated that the half signal at Airport Road would work satisfactory on opening day and at the design year regardless of whether or not a fourth northbound or second southbound left turn lane at Indianola Cutoff were included, with the exception of the westbound left turn movement from Airport Road which is expected to cause intersection signal failure 10-20 years after opening day, necessitating the likely future restriction of westbound left turns out of Airport Road.

Conclusion

In summary, even by providing four northbound through, three southbound through, two southbound left turn lanes, and two westbound left turn lanes at the Indianola Cutoff intersection, which would maximize the efficiency of the traffic signal timing, operational performance would not be at acceptable levels for the design year in 2038, confirming that signalizing Indianola Cutoff is not a viable option for the Eureka-Arcata Corridor. Due to the high level of traffic volumes present in the corridor, a more advanced intersection treatment is required to adequately facilitate traffic through the corridor. For this very reason, a signalized alternative at Indianola Cutoff was eliminated from consideration years ago in the project development process.

A traffic signal at Indianola Cutoff would immediately introduce added congestion to the U.S. 101 corridor between Eureka and Arcata on opening day even if additional lanes were provided to optimize the intersection's signal performance.

Additional lanes are often needed when traffic signals are being installed at an intersection because vehicles need to be "stored" and separated while being required to stop during red time. More importantly, extra lanes are needed to "push through" as many vehicles as possible during green time. Vehicles that cannot make it through the intersection during the green time given to them in a cycle length need to wait until the next cycle before they are given green time again. The additional lanes allow traffic to pass through the intersection side by side during green time, resulting in the green time serving more vehicles. Since each cycle length is a finite period of time, only so much green time can be allocated to each phase of a cycle. Cycle lengths typically vary from 1 to 2 minutes, depending on the specific location and can be longer in some cases. When vehicular demand exceeds the amount of traffic that can be served during the green time, cycle failure occurs resulting in increased backups on the roadway.

Interchanges do not require traffic to stop and wait for the next available green time as is the case with signalized intersections. For this reason, additional lanes are usually not needed on four lane (two lanes in each direction) divided highway/expressway/freeway segments when interchanges are added, unless traffic volume and weaving movement levels on the mainline require it to alleviate congestion.

c: Mark Suchanek, Matt Brady, Todd Lark, Eric Brunton

TAA:taa/esb

Attachment 1 – Results of Operational Analysis of Two- Signal Scenario

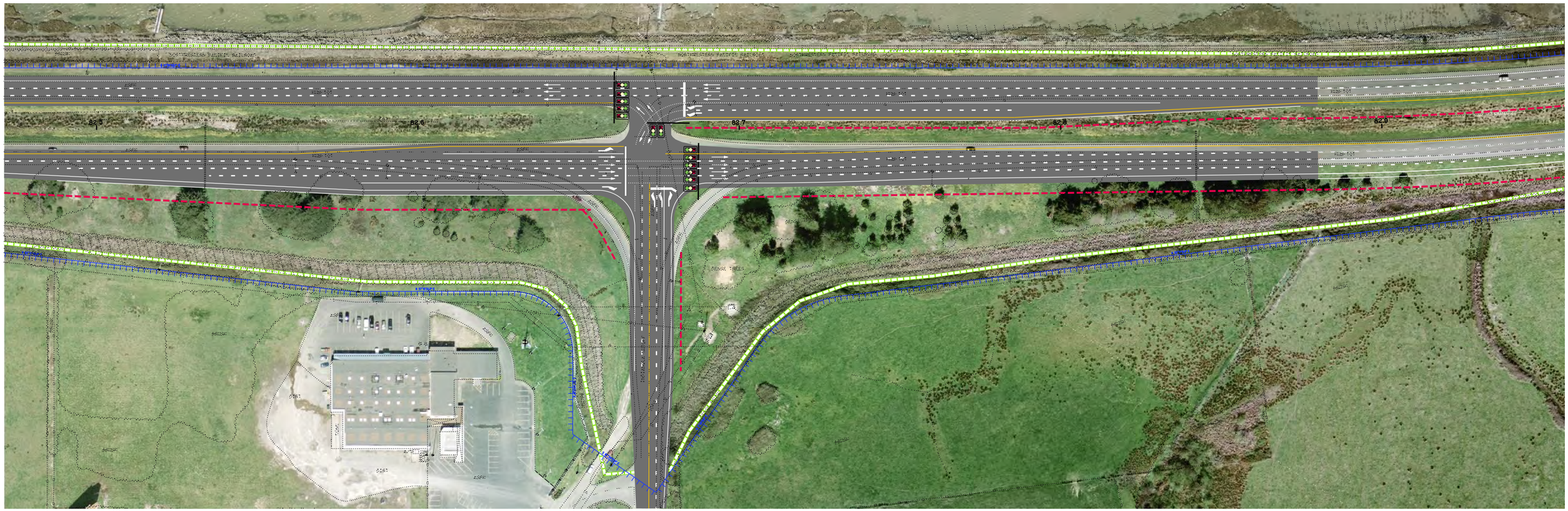
Full Signalization at Indianola, 4 NBT, 3 SBT, 2 SBL, 2 WBL (optimized)									
		2018				2038			
Time		NBT	SBT	SBL	WBL	NBT	SBT	SBL	WBL
7-8 AM	LOS	C	A	F	D	C	B	F	D
	V/C	.73	.60	.94	.28	.90	.80	1.15	.33
4-5 PM	LOS	C	A	F	D	C	B	F	D
	V/C	.94	.60	1.41	.31	.97	.76	1.93	.43
Full Signalization at Indianola, 3 NBT, 3 SBT, 1 SBL , 1 WBL (optimized)									
		2018				2038			
Time		NBT	SBT	SBL	WBL	NBT	SBT	SBL	WBL
7-8 AM	LOS	C	B	F	D	C	B	F	D
	V/C	.78	.66	.87	.45	.90	.80	1.21	.56
4-5 PM	LOS	F	B	F	F	F	B	F	F
	V/C	1.02	.73	1.40	1.02	1.44	.89	1.73	1.25

KEY:

NB=northbound
SB=southbound
WB=westbound
T=through lane
L=left turn lane
1, 2, 3, 4 =indicates number of lanes
For example: 4 NBT means "4 northbound through lanes"

LOS=Level of Service
v/c=Volume to Capacity Ratio (v/c > 1.0 indicates over capacity)

2018 is opening day year
2038 is design year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EL Wahl

CALTRANS RESPONSE TO TJKM TRAFFIC STUDY RE: WALMART AT INDIANOLA ROAD.
1-Hum-101-82.67 April 1, 1993

TRAFFIC STUDY:

The traffic study acknowledges that the recommended signal is a short-term solution for the Route 101/Indianola intersection. The study suggests signalization should be undertaken as an interim solution along with a commitment that an interchange be constructed within 8 to 9 years. Caltrans cannot commit to an interchange at that location, given the lack of state funds for interchanges to support local development, the limited potential opportunities for local contribution (few parcels zoned for commercial/industrial use in Indianola vicinity), and environmental constraints (wetlands), and physical constraints (railroad).

The traffic study seemed to have acceptable trip generation rates, although it should have included Saturday trip data and data for trips from a fast food business to be located on the out-parcel (as described by the project applicant at the 12/21/92 meeting). Since the traffic study did not make pass-by trip reduction calculations, it errs on the side of caution. The traffic study needs to address impacts to other intersections, such as Bayside Cutoff, Bracut, Mid City Motor World, and Jacobs Avenue. The traffic growth should include growth on Old Arcata Road/Myrtle Avenue in addition to the growth for through traffic on Route 101 (the latter was provided in the traffic study). Since the WalMart project could be growth-inducing, it should be considered jointly by the Cities of Arcata, Eureka, Humboldt County as well as Caltrans.

The traffic study Level of Service (LOS) analysis is for two different facility types, an expressway and a signalized intersection, which are not really comparable. The LOS on turning moves is not a priority to Caltrans. Our priority concerns through traffic LOS.

The traffic study provides a minimal look at the range of alternatives for mitigation purposes. We had previously suggested that the traffic study evaluate alternatives to signalization. The study dismisses an interchange as an alternative "due to funding constraints and the lead time to obtain funding and complete approval...".

SIGNALIZATION:

Pros:

- Some volume warrants may be met
- Would improve flow of cross-traffic
- May provide gaps in traffic flow to improve merges from adjacent intersections

EXHIBIT 19
CC-016-13
Caltrans "Walmart" Memo

Cons:

- Long-term need for interchange or grade separation
  - Lack of State funds for interchanges to serve development
  - Environmental constraints
  - Physical constraints
  - Limited local or developer participation (only a few developable parcels zoned for commercial/industrial uses)
- Increased volumes at the intersection (maybe)
- Delay for through traffic
- Possible increase in total accidents
- Sets precedent for signals at adjacent intersections
- Could cause queuing at V St.
- County Public Works is opposed to signalization

There is not a strong reception at Caltrans concerning the idea of signals. Installing a signal at Indianola Road would convert the expressway between Eureka and Arcata to an urban arterial street, which would not be consistent with the concept of freeway/expressway for an inter-regional road and would not likely be well received by the public. A signal would cause delays for through traffic. Caltrans would want to hear from the public before allowing a signal.

If accident/operational problems were to occur at that intersection, independent of any new development, Caltrans would consider closing the median before installing signals. A signal at that intersection raises concerns about safety, given fog conditions that prevail. Accident rates may stay the same, but the type of accident would change from broad-side to rear-enders. There is not enough of an accident history at this intersection to qualify as a safety project. The overall accident rate is 0.24 actual versus 0.25 expected. The actual fatal plus injury accident rate is 0.15 versus the 0.10 expected rate. During the last 5 years, there has been 1 fatality and 8 injuries. The fatality rate is .016 actual and .004 expected.

POSSIBLE ALTERNATIVES:

- Interchange
- Close median at Indianola and/or at adjacent intersections; closing median at Indianola/Route 101 was discussed in the traffic study
- Elevate north-bound lanes
  - could include Caltrans participation
  - Caltrans could provide a range of costs
- Purchase land (corridor preservation for future interchange, to tie into future Eureka freeway or for wetland mitigation banking)
- Install signal for northbound only and create a long merge for west-bound to south-bound

State of California

ELWon

Business, Transportation and Housing Agency

Memorandum

To 1-RSKnapp
2-CSWillis
File

Date June 24, 1993

File No. Indianola WalMart
1-Hum-101-82.67

From : DEPARTMENT OF TRANSPORTATION District 1
Linda Goff Evans, Associate Transportation Planner

Subject CALTRANS RESPONSE TO TJKM TRAFFIC STUDY RE: WALMART AT INDIANOLA ROAD.

On April 8, 1993 at 2:30 p.m., the following people met to discuss the TJKM traffic study for a proposed Walmart/Sam's Club at Indianola: Jerry Haynes, Rick Knapp, Jim Graham, and Linda Evans from Caltrans; Dan Moody, Gary Boughton and John Arnold from the City of Eureka; Don Raffaelli and Peter Rei from Humboldt County Public Works; Steve Weinberger from TJKM traffic consulting; Craig Eisenberg and Scott Spier from Eisenberg Co. representing Wal-Mart.

The purpose of our meeting was to convey Caltrans' position in response to the TJKM traffic study recommendations, in particular our position on signalization of the Indianola Cutoff/Route 101 intersection.

Caltrans distributed a copy of a draft letter response to Gary Boughton, Acting City Engineer, which described many of our concerns.

Steve Weinberger described the rationale for the signalization proposal and described a similar signal in Sonoma County on Route 12 west of Route 101 at Stony Point Road, between Santa Rosa and Sebastopol. Steve said that the signal has been in and operating sufficiently for 7 or 8 years.

Rick Knapp indicated the differences between the Route 12 signal and the proposed Route 101 signal. Since Route 101 is an inter-regional road, with a concept of freeway/expressway, it does not really compare. Also, the traffic study indicated that the signal would not work well after just a few years due to the volumes that would have to be handled.

Gary Boughton said with the water treatment plant to be constructed at the source of withdrawal, the City expects to see some growth. The City has a water transmission line that will extend south to Eureka along Old Arcata Road.

Don Raffaelli asked about the CTC policy concerning growth-related impacts and cost sharing. Rick responded that the CTC is looking to developers to pay for development generated impacts. However, the CTC is looking more favorably toward funding projects where there is local

contribution/funding from development impact fees.

Craig Eisenberg stated that Wal-Mart wants to proceed in stages with the signal at the beginning, and to look for local participation or other funding sources to finance an interchange in 6 or 7 years when the traffic study projected the need to arise.

Rick stated that signals at Indianola would be precedent-setting in that other intersections along that reach of highway (Jacobs Ave., Mid City, ARCO, Bracut, Bayside Cutoff) would also want signals. Our highest priority is to provide for the through traffic. Jerry Haynes stated that there would be queuing from signals, delays for northbound traffic, and a probable increase in rear-end accidents. If a full interchange would be necessary in the future, the project site is the only logical place to put one due to environmental conflicts with wetlands, Humboldt Bay and physical conflicts with the railroad.

Don Raffaelli reaffirmed the County's opposition to signals at Indianola. He said it would result in a change in functional classification and a reduction in LOS. He stressed the need for local participation in order to finance any highway improvements.

Jerry Haynes said that Caltrans has not studied the possibility of an interchange at this location. However, an interim solution was discussed that would involve elevating the grade of the north-bound lanes at a cost of approximately $4.5 million (70 mph design speed; 3400' end to end; 15' vertical clearance). Rick indicated that the District is limited on discretionary funds to $300,000 on any one project. For higher dollar amounts, it would take CTC action.

Craig Eisenberg expressed interest in exploring the feasibility of the partial interchange. He asked about funding options, whether bonds could be made available, whether the business area could be extended. Steve Weinberger asked if an interim signal would be allowed if a serious proposal came forth on the partial interchange. The meeting concluded with the understanding that Eisenberg Co. would be investigating the feasibility of a partial interchange and would bring back a proposal for Wal-Mart.

cc: ELWahl
JGHaynes
MDVanZandt
AOSauls
FUlulani
MLSuchanek
GKLuther
1-JEGraham
2-JDTatum
3-SShipman

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PROGRAMMED IMPROVEMENTS

Table III below is a listing of programmed improvements on Route 101 in the 2000 State Transportation Improvement Program (STIP).

TABLE III
2000 STIP PROGRAMMED CAPACITY INCREASING IMPROVEMENTS

POST MILE	IMPROVEMENT	Construction Schedule To Begin	Programmed Cost in 2000 Dollars[10]
MEN-101-PM 5.7/9.2	South Hopland Unit III, four-lane Expressway - 3.4 mi.	Under construction	$ 16,668,000
MEN-101-PM 8.8/13.0 & MEN-101-PM 13.6/17.6	Hopland Bypass and North Hopland, four-lane Freeway/Expressway (PDS only) 8.8 mi.	PDS only*	$ 7,200,000
MEN-101-PM T43./52.3	Willits Bypass, four-lane Freeway - 7.8 mi.	2004/05**	$ 130,000,000
HUM-101-PM 57.0/58.8	Rtes 101/ 36 Interchange and Frontage Roads 1.8 mi.	2005/06[x]	$ 4,795,000
HUM-101-PM 79.8/85.8	Eureka/Arcata Corridor Improvements	2008/09	$ 2,613,000
DN-101-PM R27.5/27.9	Washington Blvd., Freeway Ramp - 0.4 mi.	2001/02	$ 3,374,000

Programmed cost includes Right of Way, except for PDS only projects.
*** PDS = project development support, the project is funded through Project Approval and Environmental Document.**
**** includes funds for construction and R/W only**
[x] - does not include construction dollars

In addition to projects programmed in the STIP, nearly 17 projects on Route 101 are programmed in the State Highway Operation and Protection Program (SHOPP) at a cost of approximately $80 million. These projects generally address safety, rehabilitation, bridge replacement and operational concerns.

V. ENVIRONMENTAL CONSIDERATIONS

Principal environmental concerns along Route 101 in District 1 include:

- Wild and Scenic Rivers: Route 101 follows the Eel River in Mendocino and Humboldt Counties, and crosses the Van Duzen River in Humboldt County and the Klamath and Smith Rivers in Del Norte County. These wild and scenic rivers have critical salmon and steelhead spawning and nursery habitats, and are unique visual resources.
- Salmon and steelhead: The Route 101 Corridor crosses many large and small river systems that support critical habitat and populations of sensitive species, and water quality is of significant concern on these watercourses.
- The impact of gravel extraction on highway structures.
- Soil stability is a factor for concern along many areas of Route 101.
- Route 101 has archaeological and culturally significant sites where the local Native American tribes gather food and materials necessary for everyday life, sites where their ancestors lived and are buried, and sacred sites associated with religious activity.

[10] CTIPS, Current Official STIP Document, September 2000

EXHIBIT 20
CC-016-13
Caltrans Route Concept Report, p. 17

Exhibit 2 Parcel(s) Location Map.

(Portions of the Eureka, Arcata South, Arcata North and Tyee City USGS 7.5 minute quadrangles)

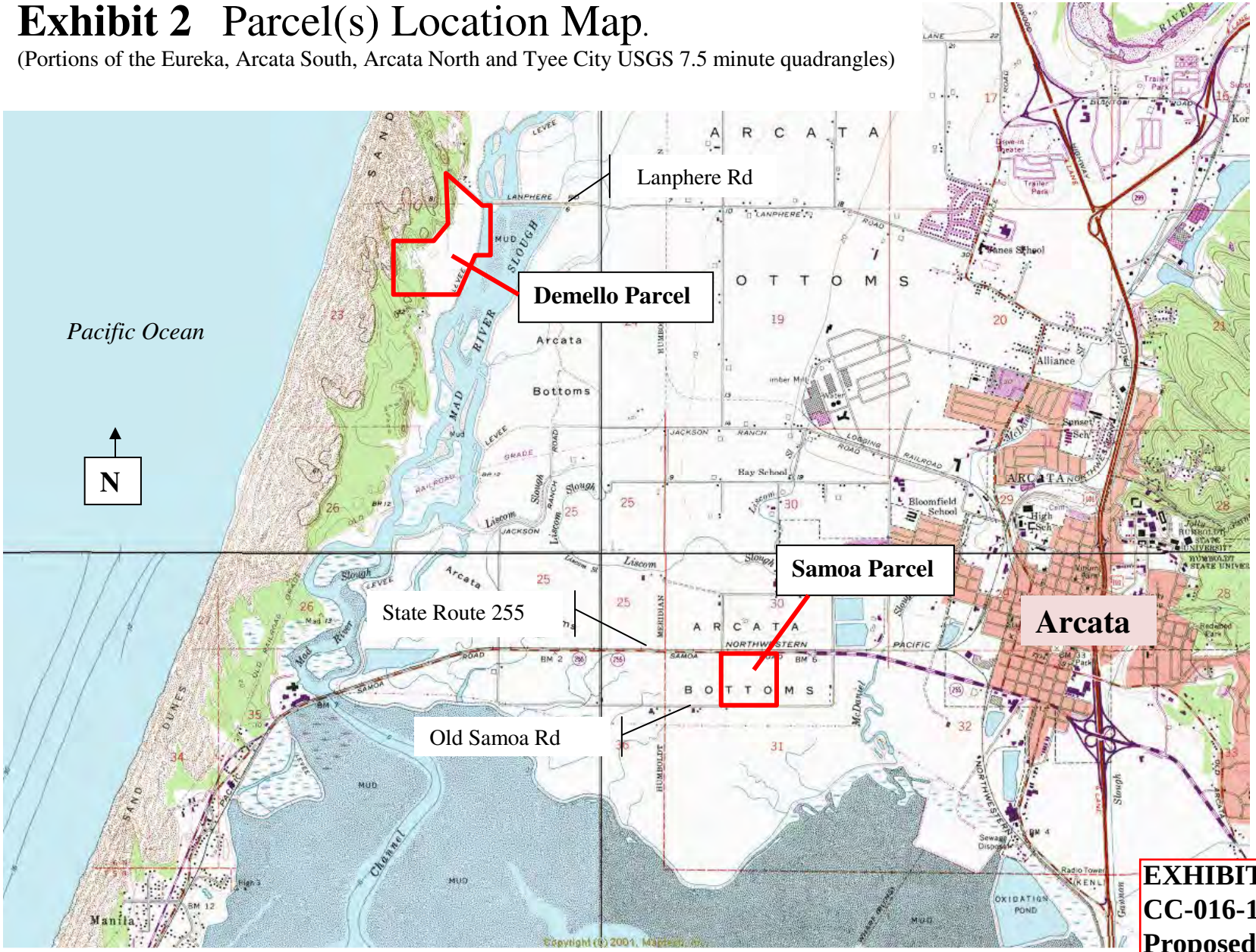
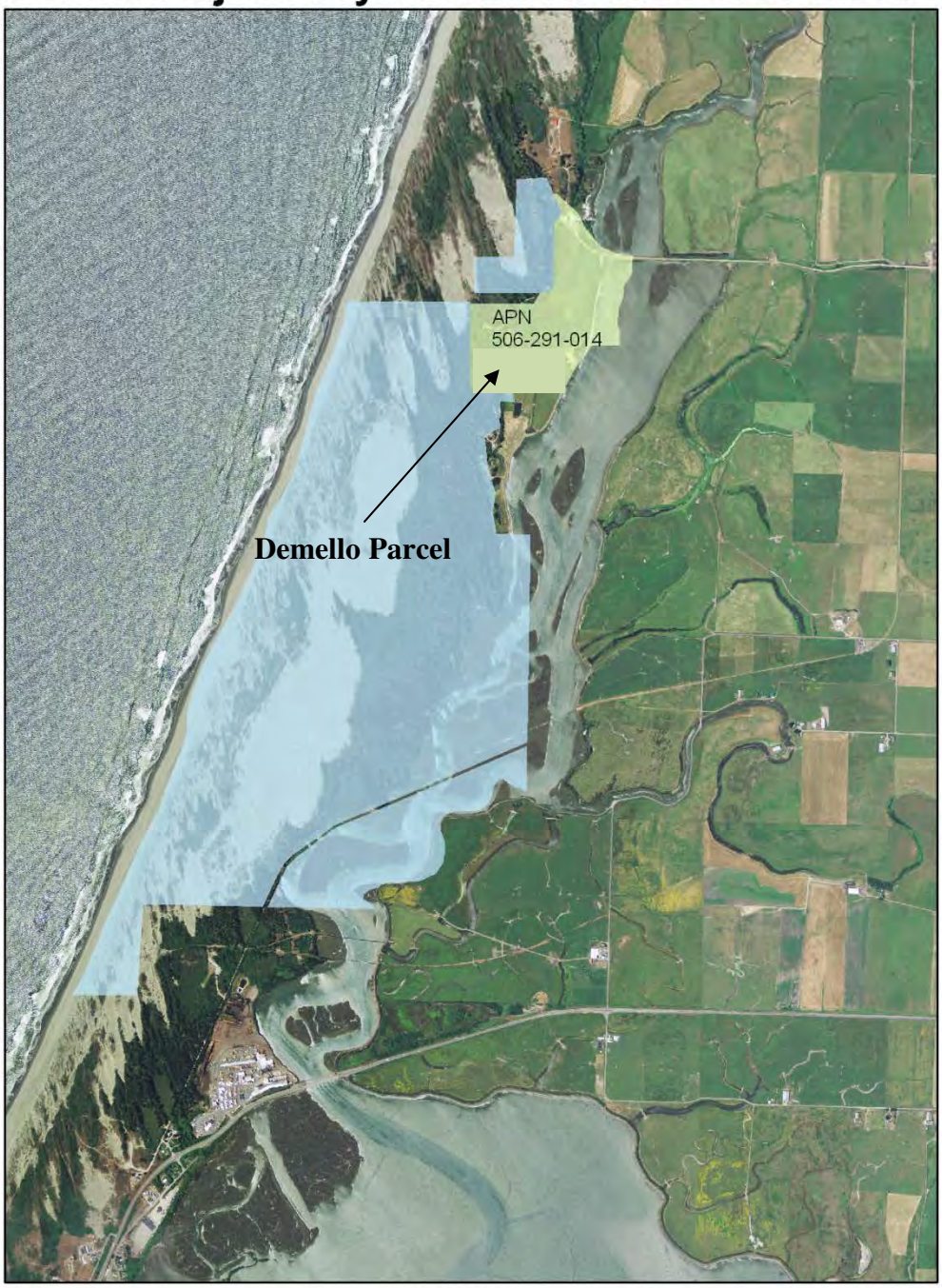


EXHIBIT 21
CC-016-13
Proposed Wetland Restoration Sites

Exhibit 3a
Parcel Adjacency to Public Resource Lands



Legend

Demello

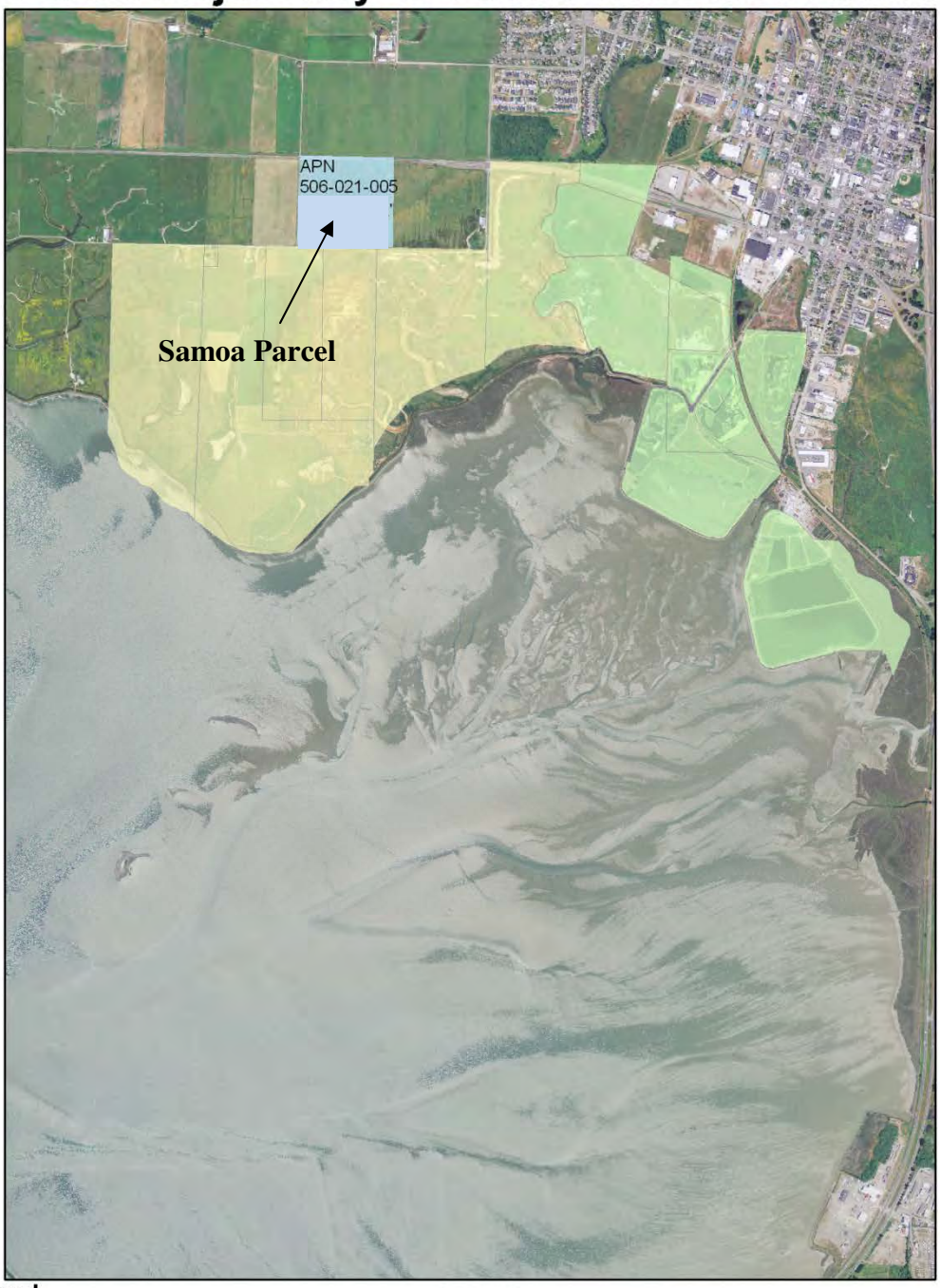
USFWS Lanphere Dunes Unit

1 : 24 000

0 0.25 0.5 1 Miles

N W E S

Exhibit 3b
Parcel Adjacency to Public Resource Lands



Legend

- Samoa
- CDFG Mad River Slough Wildlife Area
- City of Arcata Marsh and Wildlife Sanctuary

1 : 24 000

0 0.25 0.5 1 Miles

N W E S

Response to CC-016-13, Staff Report Comments on Draft Wetland Mitigation/Restoration Plan

California Coastal Commission (CCC) Comment: The draft Restoration Plan for the Demello and Samoa parcels appears to be written in language primarily intended to satisfy U.S. Army Corps of Engineers mitigation guidance.

Because Caltrans must mitigate for impacts to aquatic resources that are under both federal and state jurisdiction, proposed mitigation is written in the language of federal regulation, the "Mitigation Rule" (33 Code of Federal Regulations (CFR) parts 332 and 40 CFR 230). The Coastal Act utilizes California Environmental Quality Act (CEQA) guidelines to establish mitigation practices. It can however be problematic that under joint National Environmental Protection Act (NEPA) and CEQA review, a shared vernacular for mitigation terms is lacking; it would be consistent with CEQA Guidelines Section 15370 if all parties were to utilize the mitigation definitions of the federal Mitigation Rule[1]. The Mitigation Rule is a definitive legal document regulating how mitigation for impacts to wetland and waters under federal jurisdiction it is to be defined, *as well as how it is to be performed*. State agencies have the discretionary and independent authority to require mitigation that may be additive to that required under federal authority.

CCC Comment: The draft Plan also asserts that upland buffers may be given mitigation credit, which the Commission has not historically allowed.

Chapter 1 of the "CCC Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone" (CCC Guidance) states that in establishing wetland buffers one must consider that buffers should provide habitat for species residing in the transitional zone between wetlands and uplands. Chapter 2 goes on to recommend that wetland restoration design consider the establishment and maintenance of buffer areas both for wetland protection and to provide habitat for animals. The proposed restoration of transitional upland habitat, a minor component of our overall restoration plan, should be creditable.

CCC Comment: Caltrans would need to establish, among other things, that no non-agricultural lands are available or feasible to be used as a mitigation site.

Within the Humboldt Bay area, no feasible non-agricultural lands are available for the development of mitigation (restoration) to compensate for impacts to wetland habitat. Caltrans has previously submitted to CCC staff a listing of the numerous mitigation options pursued prior to arriving at the current proposal.

[1] CEQA Guidelines (Section 15370) notes that CEQA has adopted the definition of the term "mitigation" contained within the federal NEPA regulations so that this term will have identical meanings under joint NEPA/CEQA review.

EXHIBIT 22
CC-016-13
Caltrans Response to CCC Wetland Comments

CCC Comment: The Commission has not historically authorized conversion of agricultural lands in the Humboldt Bay area to mitigate wetland fill projects,

In Section 30001 of the California Coastal Act, the California legislature has declared that the coastal zone is a distinct and valuable natural resource of vital and enduring interest and as such it necessary to protect the ecological balance (of the coastal zone) and prevent its deterioration and destruction. Legislation to affect the specific protection of coastal wetlands from development is afforded by Section 30233(a) of the Coastal Act. Additionally, Section 30240 clearly protects environmentally sensitive habitat area (ESHA), stating that ESHA must be protected against disruption of habitat values and that the avoidance of ESHA, for non-resource dependent development, is mandatory.

Section 30241 of the Act protects prime agricultural land while other lands suitable for agricultural use are protected from conversion under Section 30242; however neither of these provisions provides for a ranking of agriculture as a use within the hierarchy of Coastal Act uses. As the Coastal Act provides no legislative authority to regulate agricultural use as a priority over habitat protection and restoration, clearly, preservation of agriculture is not intended to take precedence over the protection and restoration of wetlands and ESHA.

In a letter to the CCC Chair, Ralph Faust, former CCC Chief Counsel (in commenting on the CCC's regulation and preservation of agricultural lands in the coastal zone) reviews a history of CCC assertion of jurisdiction over agriculture (letter dated May 2, 2013). In quoting the first and primary CCC assertion of agricultural jurisdiction, Faust notes the CCC concern over agricultural intrusion into riparian and/or wetland habitat; stating that in a traditional interpretation the assertion of jurisdiction over agriculture was primarily intended to prevent the expansion of agriculture into sensitive habitat. Elsewhere in his letter, Mr. Faust also notes a reasonable assumption under the language of the Coastal Act, and prior CCC interpretation, is that ESHA preservation has higher priority than agriculture. Mr. Faust concludes that it is fair to assume that the ultimate goal of the Coastal Act is the *preservation of habitat* and *all else is subordinate*, as consistent with Section 30240 of the Act and years of CCC practice.

Caltrans is aware of a private developer seeking to construct a mitigation bank in the south area of Humboldt Bay[2], on lands that are identical to those Caltrans proposes to restore, with respect to existing land use (grazing/haying) and habitat position/condition (former tidelands now expressing as seasonal freshwater wetlands); while these lands are zoned commercial, the current land use is grazing and haying. The private developer proposes to construct mitigation that would restore wetland in a manner identical to that which Caltrans proposes. Per the developer, he has received encouraging feedback from

[2] Personal Conversation with Jim Hoff, private developer, April 4, 2013.

local CCC staff regarding his proposed endeavor, with local staff additionally encouraging the "creation" of wetlands on site through the excavation of a natural landform (transitional upland habitat).

One might conclude that the subtle but significant difference between the private proposal and the Caltrans' proposal is zoning; the private developer offers up commercially zoned property while Caltrans offers agriculturally zoned properties; again, the current land use for both proposed ventures is identical (grazing/haying). The Coastal Act regulates prime agriculture and other lands suitable for agriculture, not zoning, and the commercial properties are clearly "suitable for agriculture". It is puzzling as to why the developer's lands appear to CCC staff to be more suited to mitigation than those Caltrans has brought forward. The parcels Caltrans proposes for use are contiguous to hundreds of acres of protected natural resource properties; while the developer's parcels are bisected by a four-lane divided highway which runs down the middle of them.

Caltrans proposes to rectify damages to coastal wetlands and ESHA that have been incurred by both development and continuing agricultural practices. The CCC could find the following:

- The Coastal Act establishes a fundamental and primary goal that is *the protection of habitat* (wetlands and ESHA), and
- Proposed restoration is most protective of coastal resources pursuant to Sections 30007.5 and 30200(b) of the Act (the balancing provisions for resolving policy conflicts).

The CCC did just that with Coastal Development Permit 1-06-036 A-1, the McDaniel's Slough Wetland Enhancement Project, by permitting the conversion of 90 acres of grazing lands (which coincidentally are adjacent to the Samoa parcel) for wetland restoration purposes by invoking Section 30007.5 to find that implementing the proposed wetland restoration was most protective of coastal resources versus continued agricultural (grazing) use.

Like the McDaniel Slough project, our proposed wetland restoration project is also most protective of coastal resources, because:

- the area in question historically comprised fully functional tidal wetland and freshwater wetland and riparian fringe habitat that was diked and drained to make suitable for agricultural use;
- around Humboldt Bay, a far greater percentage of fully functional coastal wetlands (90%) have historically been lost than have coastal agricultural lands (perhaps 5%);
- with little grading or hydrologic manipulation, the sites are anticipated to return to and maintain historic and natural wetland characteristics, and

- proposed restoration will expand upon existing natural resource properties, providing continuity of use patterns, improved wetland function and habitat connectivity.

CCC Comment: The Commission has not historically allowed "enhancement" to mitigate wetland fill projects; instead creation of new wetlands is normally required to compensate for a net loss (filling) of wetlands associated with a proposed project.

This assertion runs counter to Chapter 2 of CCC Guidance. Chapter 2 acknowledges that the creation of new wetland is an endeavor wrought with uncertainty and warns "CCC staff should be very cautious in recommending wetland creation projects as mitigation for the loss of existing wetlands". (This guidance goes on to further discuss that *enhancement of degraded habitat* (defined as rehabilitation under the Mitigation Rule) *may be included* in a mitigation plan.)

In 2001, a nation-wide study by the National Academy of Sciences found that across-the-board wetland creation as a compensatory form of mitigation had failed to achieve a no net loss of aquatic function and value. The results of this study precipitated the enactment of the federal Mitigation Rule in 2008, which now *prescribes* that *wetland restoration* is the preferential form of compensation.

Under the federal Mitigation Rule wetland restoration, which is defined to include both wetland re-establishment and rehabilitation, (or "enhancement" and "restoration" in CCC usage of the terms[3]) *is the preferred form of compensatory mitigation*. Under CEQA, State agencies retain discretionary and independent authority to require mitigation that may be additive to that required under federal authority.

Per Section 30607.1 of the Coastal Act: *"Where any dike and fill development is permitted in wetlands in conformity with Section 30233 or other applicable policies set forth in this division, mitigation measures shall include, at a minimum, either acquisition of equivalent areas of equal or greater biological productivity or opening up equivalent areas to tidal action."*

With regard to Section 30607.1, Chapter 3 of the CCC Guidance advises that in practice the CCC has interpreted the phrase "at a minimum" to require inclusion of a restoration component in any acquisition plan. An alternative recommended mitigation approach is the "opening up equivalent areas to tidal action".

The Caltrans mitigation proposal meets the criterion for an acquisition with a restoration component. Additionally, as conceptually proposed, we hope to open up a more-than-equivalent acreage to tidal action. The proposed mitigation proposal more

[3] As the terms are utilized in Chapter 2 of the CCC Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone.

than fully compensates for projected project related impacts to highly degraded jurisdictional wetland, and in fact may over-compensate[4].

DEMELLO PARCEL

CCC Comment: As noted above, much of this site already qualifies as a coastal wetland, rendering restoration primarily "enhancement" rather than "creation" of new wetland habitat. Restoration of the grazed, lower area to tidal wetlands would be beneficial… however… (Caltrans) acknowledges (p. 10) the likelihood that the final plan will involve implementing freshwater wetland enhancement.

In conformance with the science predicating the Mitigation Rule, Caltrans does not propose to perform the "creation" of wetlands; however, re-establishment of three-parameter wetland and wetland rehabilitation (or enhancement, as CCC uses the term) is proposed.

In consultation with CCC staff since 2007, Caltrans has proposed to preferentially perform tidal restoration at the site. Any "acknowledgement" of a "likelihood" to instead perform a freshwater restoration, and/or that likely "site-constraints" exist (within the plan dated January 2013) is a mis-wording on Caltrans' part likely resulting from a third repackaging of our mitigation proposal. Our intent is to whole-heartedly pursue tidal restoration at the site. If this does prove to be infeasible, then a muted tidal approach would be pursued; only as a last resort would a freshwater approach be utilized. With regard to feasibility studies, Caltrans has been and continues to *seek CCC support* for our restoration proposal *prior to expending limited funding* on hydraulic design studies.

CCC Comment: While in the past, the Commission has authorized tidal restoration of degraded seasonal, but historically tidal, wetlands as mitigation for wetland impacts (e.g., in San Dieguito wetlands in southern California), as noted above such conversion has been limited locally to the context of pure restoration (versus enhancement) activities.

Our tidal restoration proposal *does* consist of "pure restoration" under the federal definition; it may not under a CCC usage of the term, pointing once again to the fact that a set of common terms is desired. However, linguistic challenges aside the proposal is in full compliance with Section 30607.1 of the Coastal Act which legislates that the opening

[4] Proposed mitigation likely over-compensates for projected impacts (fill) to approximately ten acres of highly degraded seasonal wetlands within a narrow strip over a distance of many miles. To-be-filled wetlands have been previously affected by multiple factors including: the previous historic conversion from their natural state as a tidally influenced wetland to a freshwater system; their location beside, and between, a four-lane divided roadway; and, their routine mowing for roadway maintenance reasons. These wetlands exhibit extremely low functionality related to the following function/value criteria: production export, wildlife diversity/abundance, aquatic diversity/abundance, uniqueness or heritage value, recreation value, or storm water treatment. In contrast, proposed mitigation will provide for coastal wetlands with extremely high functionality with regard to the same criteria.

up of equivalent areas to tidal action is in itself appropriate mitigation for impacts to coastal wetlands.

CCC Comment: Also, please note that the Commission has historically denied permit applications in the Humboldt Bay area for conversion of seasonal grazed wetlands (diked former tidelands) to freshwater ponds.

Although, we do not have complete Coastal Development Permit (CDP) numbers, Caltrans knows of at least two permit applications, of recent times, within the Humboldt Bay area that were approved for the conversion of seasonal grazed wetlands (diked former tidelands) to freshwater ponds; the McDaniel Slough restoration, and restoration performed at Dr. C.J. Ralph's ranch off Lanphere Rd..

CCC Comment: Thus, we believe planting the gaps in the existing deciduous swamp/riparian wetland along the western boundary to be simple enhancement, and not on its own appropriate as mitigation for this particular project, and that expanding that freshwater habitat into the existing wet pasture and former tidelands is also inappropriate as mitigation, and may serve to make future tidal restoration more difficult to implement. Also, it is unclear from the plan whether future road/utility easement vegetation management may affect the viability of the habitat, and/or whether the utility corridors themselves may cause habitat fragmentation or other diminution of habitat value.

CCC staff analysis of our mitigation proposal appears to have discounted the significant value of the existing deciduous swamp/riparian wetland which is present on-site, yet in need of restoration. Discounting the proposed expansion of this valuable resource, runs counter to the expertise of the adjacent land steward's United States Fish and Wildlife Service, Andrea Pickart, Ecologist, and Dr. C.J. Ralph, United States Forest Service, Research Ornithologist. As previously shared with CCC staff, Dr. C.J. Ralph has stated that the area of extant riparian habitat at Demello offers some of the richest habitat for migratory nesting birds in the state.

Performing planting in-fills to minimize habitat fragmentation to this coastal wetland type exhibiting extremely high habitat value, and/or performing expansion of this habitat into the pasture area, should be considered worthy mitigation in its own right, on an acre-for-acre basis, to offset impacts to the highly degraded, minimally functional, wetland existing within the project area.

It is highly unlikely that expanding this habitat type onto the grazed pasture would in any way preclude future tidal expansion, should that prove to be a future goal. An existing road that CCC staff references, belongs to Caltrans; no modifications will be made to it that could affect the viability of the habitat. The utility easements (extant, maintained power and phone line) are unlikely to offer any additive future level of habitat fragmentation or additive future diminution of habitat value.

CCC Comment: Finally, for this site, the proposal to restore the grazed relict dune to restored coniferous forest appears unrealistic and would presumably take decades or longer to achieve success.

With regard to the relic dune that is currently covered in nonnative grass species palatable to cows, coniferous dune forest (a protected rare and declining habitat type) can easily be established at the site, per United States Fish and Wildlife Service, Andrea Pickart, Ecologist.

SAMOA PARCEL

CCC Comment: For the reasons discussed above, the Commission staff does not believe that conversion of a large portion of the site (a third of the site) to riparian, or the grading of large areas to create ponds, could be authorized as consistent with the Coastal Act.

We do not understand how the Coastal Act could be interpreted to subordinate the protection and restoration of coastal wetlands to the protection of agricultural use. Our mitigation proposal is consistent with the Coastal Act, whose ultimate goal is the protection of habitat. Additionally our proposal is consistent with local restoration projects previously permitted by CCC (e.g. McDaniel's Slough Wetland Enhancement Project, permitting the conversion of 90 acres of grazing lands for wetland restoration including the creation of freshwater ponds; and Dr. C.J. Ralph's conversion of grazed wetland to freshwater ponds).

The CCC staff position on proposed restoration at Samoa ignores a science-based, holistic vision. Restoration of both the riparian fringe habitat (ESHA) and the seasonally saturated wetland habitat at this location will begin to remediate the loss of (likely) 90% of their historic extent. The mitigation location has been sited so as to provide additive and complimentary function to the approximate 850 acres of adjacent publically protected tidal and freshwater wetlands. The value of this proposed restoration (enhancement in Coastal terminology) *is significant*.

CCC Comment: In fact, the conversion of one type of wetland (grazed seasonal) to another (riparian) at this site may involve a net loss of wetland area at the site (e.g., filling of drainage ditches).

Restoration of riparian fringe habitat within a grazed wet pasture will in no way result in a net loss of coastal wetland acreage. Within the area proposed for freshwater fringe riparian habitat, despite the fact that they are artificial features, existing drainage swales will likely be retained in an effort to discourage potential "campers". Backfilling of drainage swales within the remainder area of seasonal wetland will serve to preclude the hastening of water off-site, and yet will not result in the loss of wetlands; filled swales

will continue to express as wetlands, as the land located between swales currently does, due to the parcel's low-lying topography, high water table and clay soil components.

Chapter 3 of the CCC Guidance specifies that the CCC work with the applicant to develop specific mitigation requirements, with the help of other State and Federal agencies. Caltrans has previously received the support of the California Department of Fish and Wildlife, the North Coast Regional Water Quality Control Board, the Environmental Protection Agency, the National Marine Fisheries Service and the United States Army Corps of Engineers for our mitigation proposal.

Figure 3-18A
Aerial Photograph of existing Route 101/Indianola intersection facing east

Figure 3-18B
Photo-simulation of proposed interchange (Alternatives 2, 3) at Indianola Cutoff

EXHIBIT 23
CC-016-13
Caltrans Indianola Interchange Photo Simulations

Photograph of Existing Route 101
facing Humboldt Bay from Indianola Cutoff

Visual Simulation of Modified Alternatives 3A Proposed Interchange
facing Humboldt Bay from Indianola Cutoff

Photograph of existing southbound Route 101 north of Indianola Cutoff

Visual Simulation of Modified Alternatives 3A proposed interchange north of Indianola Cutoff

Photograph of Existing northbound Route 101 south of Indianola Cutoff

Visual Simulation of Modified Alternatives 3A Proposed Interchange south of Indianola Cutoff

Photograph of existing southbound Route 101
South of Indianola Cutoff

Visual Simulation of Modified Alternatives 3A Proposed Interchange
south of Indianola Cutoff

EXHIBIT 24, p. 1
CC-016-13
Humboldt County LCP
Scenic areas (CSA)

EXHIBIT 24, p. 2
CC-016-13
Humboldt County LCP
Scenic areas (CVA)

EXHIBIT 24, p. 3
Composite
Orange = CVA
Yellow = CSA

ATTACHMENT 2

Mitigation Options Pursued

(For the Eureka to Arcata Corridor Improvement Project)

City of Eureka, Martin Slough
Contact: Redwood Community Action Agency (RCAA) Don Allen – problems with perpetuity (no ability for Caltrans to transfer endowment dollars to a non-profit), also RCAA has potential for other funding sources.

DFG Lands
Contact: Karen Kovacs. No ability to use DFG lands for external agency mitigation purposes.

Salt River Restoration – in Eel River watershed. Contacts: California Coastal Commission (CCC). CCC prefers mitigation within same watershed.

Security National
Contact: Randy Gans. Previewed approximately 300 acres in various parcels around Humboldt Bay, but later stated they had no interest in selling at this time.

Bode Property
Contact: Spoke with owner (Mr. Bode, 4/04/06). Properties are all developed. Had maybe 4 acres of existing wetland on a 7 acre parcel still available. Suggested property across from Drive-In at Indianola (Agricultural land at Indianola – see below).

Agricultural land at Indianola
This parcel has unpermitted fill on it per Barry Douglas Caltrans (per "Kelly Reid USACE"). This information was passed on to Carol Heidsiek at the Corps; it was never refuted. Further, this land is in ag use.

Moranda Parcel at SR 255
Contact: Earl Moranda. Not interested in selling. Later sold property to City of Arcata.

Dias Parcel (adjacent to Old Samoa parcel)
Landowner contacted, no interest in selling. Later said he'd sell in package deal with another 20plus acre parcel.

Kelley Garrett,
Mitigation Specialist
Caltrans District 1

EXHIBIT 25
CC-016-13
Caltrans List: Mitigation Options Pursued

Humboldt State University (HSU) property at Mad River Slough
Approximately 20 acres on SR 255 of filled, cut-off, old slough channels. Contact: Director of Facilities Planning, Gary Krietsch. Fall 2006 property review, unfortunately it is on a deed with several other properties of no use to Caltrans for mitigation. Gary was adamant that it was a package deal. Caltrans HazMat unit had concerns that hazardous material might be on site.

Rodoni/Rocky Gulch prop
Behind Bracutt Maintenance Station on 101, 20 –25 acres of brackish marsh enhancement (spartina removal) possible. Contact: Jacoby Creek Land Trust. Later ruled out, CCC staff did not like.

Miranda Ranch
North Coast regional Land Trust proposed a partnership to 80 acres of salt marsh. Property later sold, didn't hit the open market.

Brainard Ditch
Replumb the ditch and restore Cutoff Slough. Ruled out because the property is too close to airport (therefore controversial).

Drive-In on 101
Field review (3/31/06). Property does not appear to be wetland. Pack n' Carry very similar but all paved. Caltrans Design noted these parcels are prohibitively expensive due to need to re-locate. Further, the County of Humboldt (County) has also stated we cannot do restoration on commercial industrial props.

Bracutt Mill Yard
Contact: Rick Hess. Owner may be interested to sell 5 acres of former railroad (RR) RR right-of-way (Rick Hess says RR rights have expired). Also interested to sell 3.73 acres already wetland between RR and eucalyptus trees. However, County has stated we cannot do restoration on commercial industrial props.

Highway 101 Slough
Contact: USFWS (RayBosch) . Proposed to retrofit tide gate, convert freshwater habitat to brackish, increase habitat for Goby, decrease flooding as cattails die out. However, this work is being done as part of the project (E/A Corridor).

King Salmon/Pacific Gas and Electric property
Directed to investigate this lead by NEPA 404 meeting. Upon contact the owner responded that a project was being permitted and built to fix a dike and to re-contact in fall 2006. Not re-contacted as other leads were being pursued.

Kelley Garrett,
Mitigation Specialist
Caltrans District 1

Others

Potential to remove ½ acre parking lot at Bracutt Marsh. Not significant enough area to pursue further.

Approximately 1 acre of wetlands in Caltrans right-of-way, near Myrtle Avenue in Eureka. Caltrans could partner up with other adjacent land owners (County Schools) by buying conservation easements and create higher functioning wetland habitat in perpetuity. Caltrans later sold off these parcels as excess lands.

Wetland props on market

7 acres at Humboldt Hill and 101

1 acre at S. Broadway

Explore Conservation Easements on drainages within coastal zone on private property (CCC and poss. USACE jurisdiction) as mitigation. Coastal Conservancy says this has been done successfully on private THP props. Caltrans Right-of-Way thinks this could be public noticed for acquisition. Acquire a corridor?

Site visit on Miller property, proposed conservation easement (C/E) on "enhanced" riparian. Better would be C/E on created saltmarsh (berm to be moved increasing habitat). However this would involve and affect adjacent agricultural parcels

Kelley Garrett,
Mitigation Specialist
Caltrans District 1

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: Kim Floyd
Project Manager
District 1-Office of Project Management

Date: July 24, 2012

From: TODD LARK
North Region-Design E3

File: 01-HUM-101-PM 79.9/86.3
EA 01-366000
Route 101 Eureka Arcata
Improvement Project

Subject: Review of Barrier Separated Trail

Design has prepared typical cross sections to describe the impact associated with constructing a barrier separated trail between Eureka and Arcata. The attached drawings indicate the segments of the highway improvements planned and the necessary revision to provide a barrier separated trail. The trail was assumed to be placed to the west of US 101, along the southbound right side shoulder.

CONFIGURATION

For a two way Class 1 bicycle path, the minimum width is 8 feet. Class 1 bicycle paths require 2 feet of clearance to obstructions per Section 1003.1 of the Bicycle Transportation Design Chapter of the Highway Design Manual (6th edition). The trail would provide a 2 foot unpaved shoulder in the southbound direction, and a 2 foot wide paved shoulder in the northbound direction, due to the obstruction of the concrete barrier. This 10 foot wide paved trail would meet the minimum width requirements of a Class 1 bicycle trail. However, the requirement for a 5' separation from trail to edge of shoulder is not met (Section 1003.1(6)). The typical cross sections for US 101 also indicate reduced lane and shoulder widths as proposed for the preferred alternative, where an exception to the mandatory design standards had previously been approved. The southbound shoulder of US101 would be 10 feet to provide minimal recovery room for errant vehicles and room for maintenance, enforcement, and disabled vehicles.

WETLAND IMPACT

A temporary barrier separated trail would increase the permanent impact on wetlands, where fill would cover up to 20 feet in additional width of fill. Adding a trail from PM 79.9 to PM 85.0 would permanently impact a minimum of approximately 7.6 acres of wetlands (see table below).

BARRIER SEPARATED TRAIL ESTIMATED PERMANENT WETLAND IMPACTS				
Location		Length	Average Width of wetlands impacted	Area
PM 79.9	Crossing Eureka Slough Bridge	700 feet	14 feet	0.2 acres
PM 79.9/80.6	Eureka Slough to Airport Rd	3,400 feet	8 feet	0.6 acres
PM 80.6/83.3	Airport Rd to Bracut	14,200 feet	14 feet	4.6 acres
PM 83.7/85.0	Bracut to South G Street	6,800 feet	14 feet	2.2 acres
	Minimum Increase in Total Permanent Wetland Impacts			7.6 acres

EXHIBIT 26
CC-016-13
Caltrans Memo Barrier Separated Trail

ESTIMATED COST

Costs are estimated based on a typical cross section. Earthwork is estimated based on expected thicknesses and widths of fill at 5 representative segments of US101 from the Eureka Slough Bridge and South G Street in Arcata. Because the widening would be toward the median and under traffic, the hot mix asphalt paving thickness is assumed to be approximately 0.5' thick. A materials recommendation was not obtained for this planning level cost estimate.

It should be noted that the barrier is assumed to be a lower cost, minimum footprint Standard Plan Concrete Barrier Type 60, 2'-0" wide by 3'-0" high smooth concrete, with no traffic screens or architectural treatment. There is approximately 25,000 feet of barrier estimated between the Eureka Slough Bridge and South G Street in Arcata. Barrier rail terminal sections would be assumed to be placed at the beginning of the barrier, and one at each opening in the rail; Bracut Industrial Park, Indianola Cutoff, California Redwood (2 entrances). A decorative steel bridge rail, similar to that used on the Van Duzen River bridge would increase the cost by approximately $8 million to the cost of a barrier separated trail.

A temporary barrier separated trail was anticipated to include the crossing of Gannon Slough, which is approximately 400 feet long, and would require widening and replacing the barriers on that bridge. The estimate includes extending a segment of the trail under the Eureka Slough Bridges, and extending the trail east of Caltrans Right of Way to Jacobs Avenue. Right of Way costs for purchase of property for mitigation of wetland impacts are not known, nor is the cost of acquiring an easement from Jacobs Avenue to the Eureka Slough Bridges. The estimated construction cost of a temporary barrier separated trail is as follows:

CONSTRUCTION COST ESTIMATE TEMPORARY BARRIER SEPARATED TRAIL	
Earthwork, paving, barrier (type 60 concrete-no aesthetic)	$ 9,000,000
Gannon Slough Bridge Widening	$ 1,800,000
Total	$ 10,800,000

Please contact me for any additional information with regards to a temporary barrier separated trail.

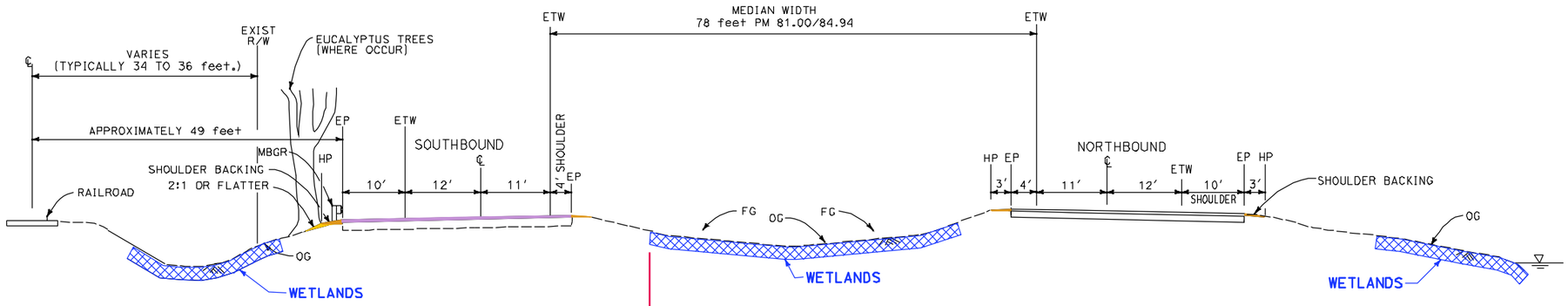
Attachments

Typical cross sections (3 sheets)

c: Project file

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

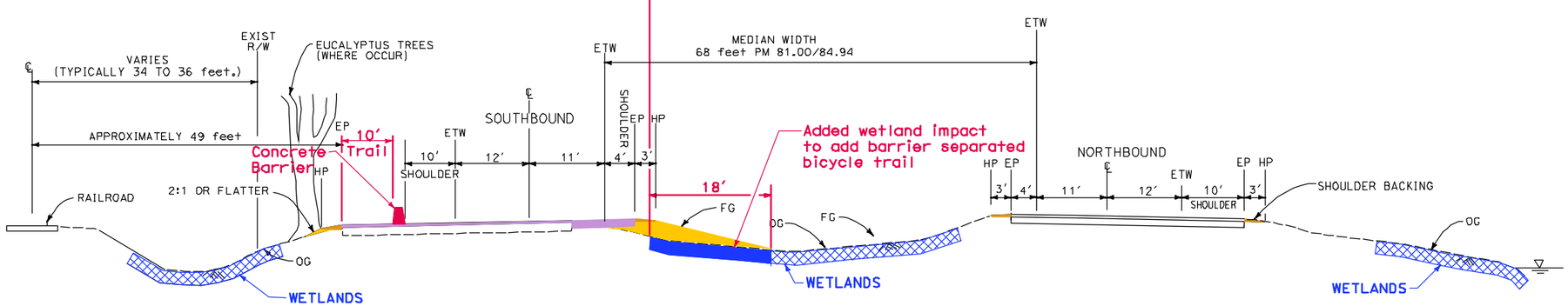
FOR DESIGN STUDY ONLY



ROUTE 101

PM 80.6/83.3

AIRPORT ROAD TO BRACUT



ROUTE 101

PM 80.6/83.3

AIRPORT ROAD TO BRACUT
Realignment for Barrier Separated Trail

BARRIER SEPARATED TRAIL
CALIFORNIA REDWOOD

Page 1 of 3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN

FUNCTIONAL SUPERVISOR: L.R. ASHLEY
CALCULATED-DESIGNED BY: TODD LARK
CHECKED BY:
REVISED BY:
DATE REVISED:

LAST REVISION 08-11-08
DATE PLOTTED => 23-JUL-2012
TIME PLOTTED => 14:52

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s119316
DGN FILE => cross-section-trail.dgn
CU 03232
EA 363301

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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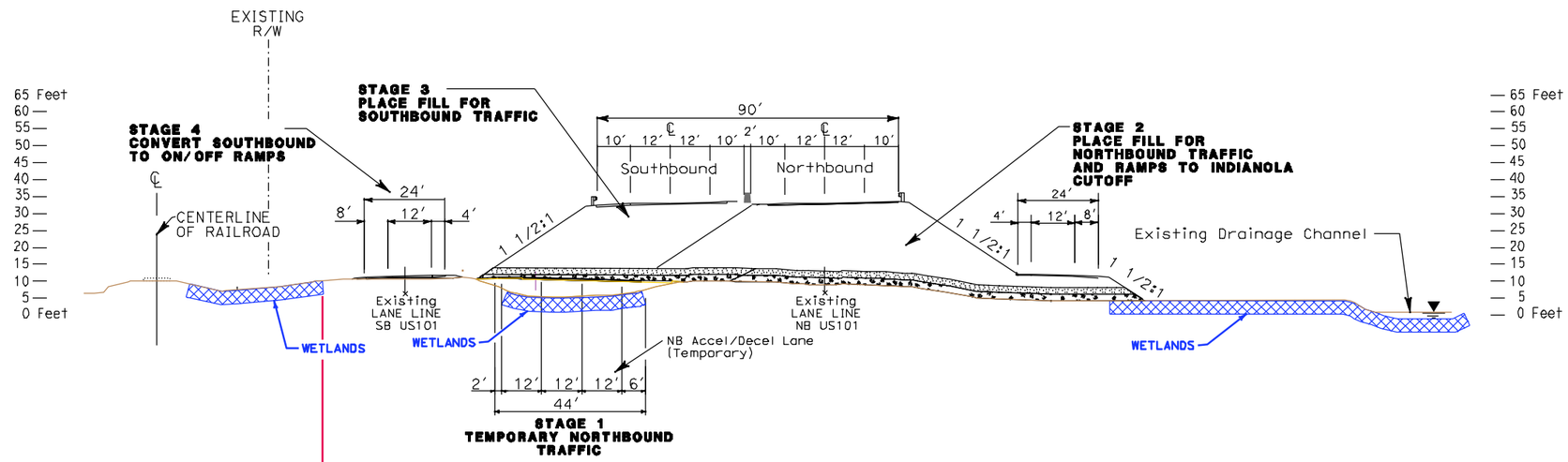
FOR DESIGN STUDY ONLY



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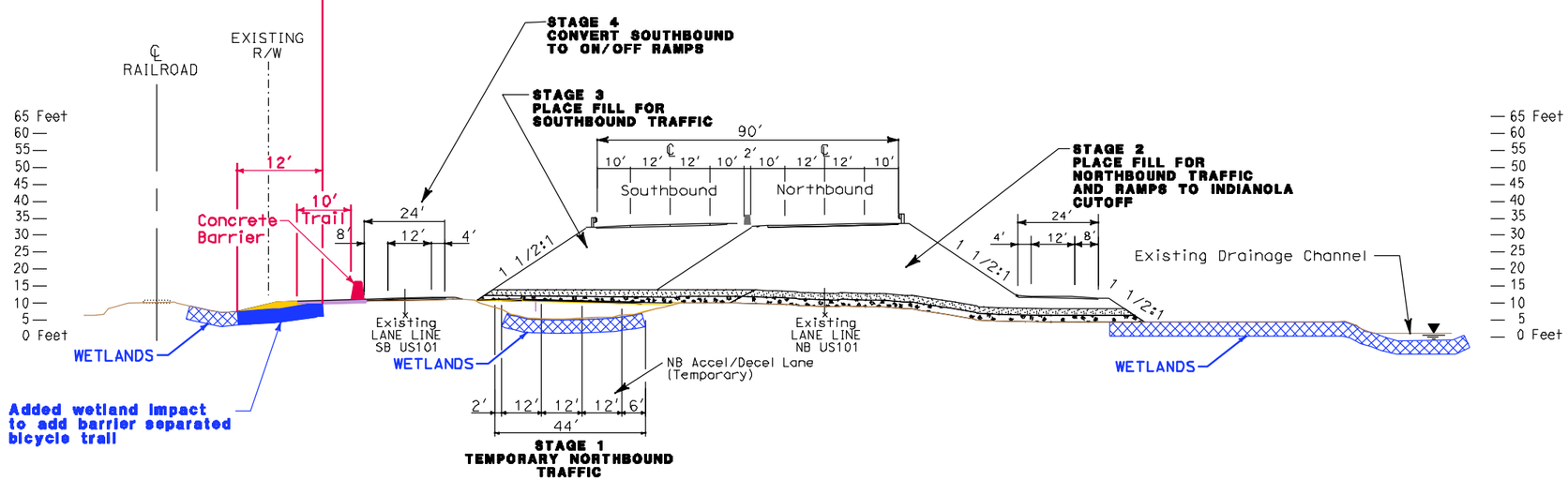

ROUTE 101

PM 82.2/83.3

INDIANOLA CUTOFF INTERCHANGE
Added Barrier Separated Trail

BARRIER SEPARATED TRAIL
INDIANOLA INTERCHANGE
Page 2 of 3

REVISED BY	DATE REVISED
TODD LARK	

CALCULATED-DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR: L.R. ASHLEY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

DESIGN

LAST REVISION 08-11-08 | DATE PLOTTED => 23-JUL-2012 | TIME PLOTTED => 14:52

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

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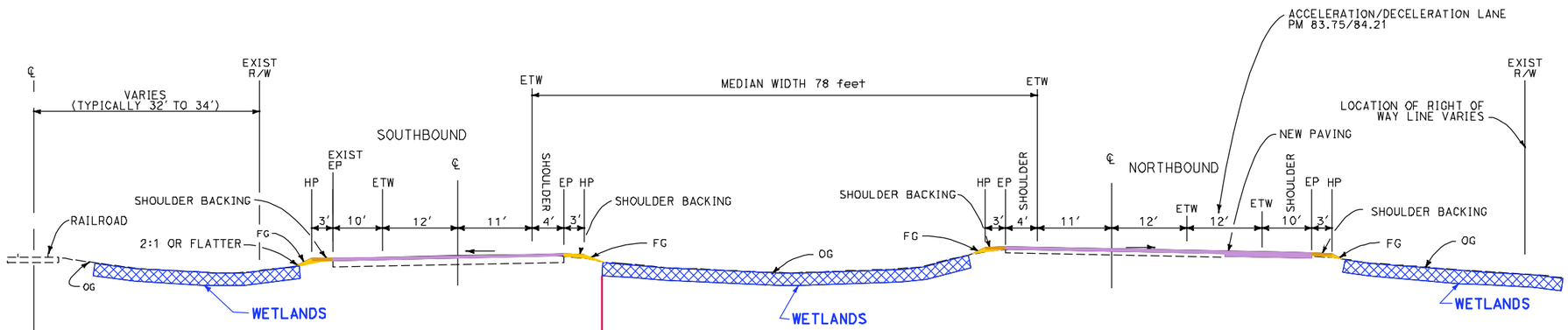

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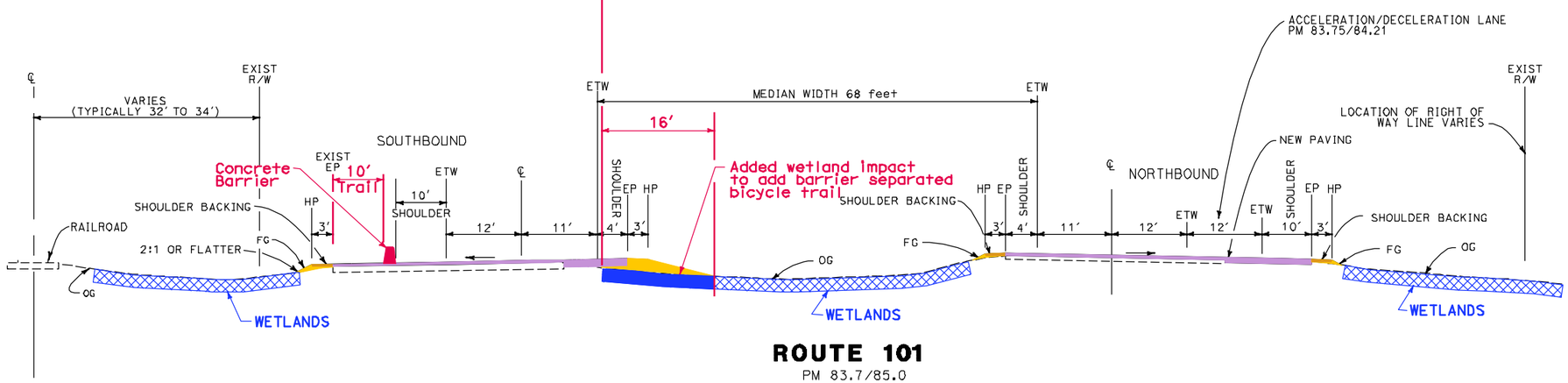

ROUTE 101
PM 83.7/85.0

BRACUT TO SOUTH "G" STREET
Realignment for Barrier Separated Trail

BARRIER SEPARATED TRAIL
NORTH OF BRACUT

Page 3 of 3

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	101	79.9/86.3		

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REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. CIVIL STATE OF CALIFORNIA

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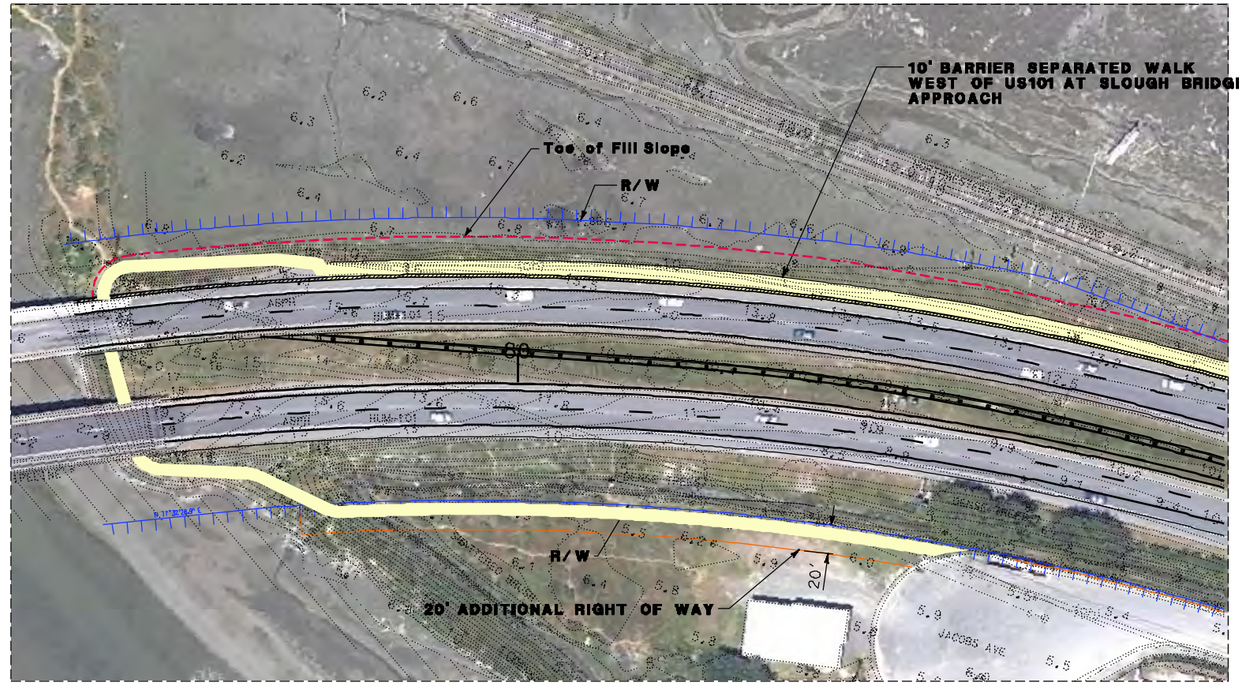

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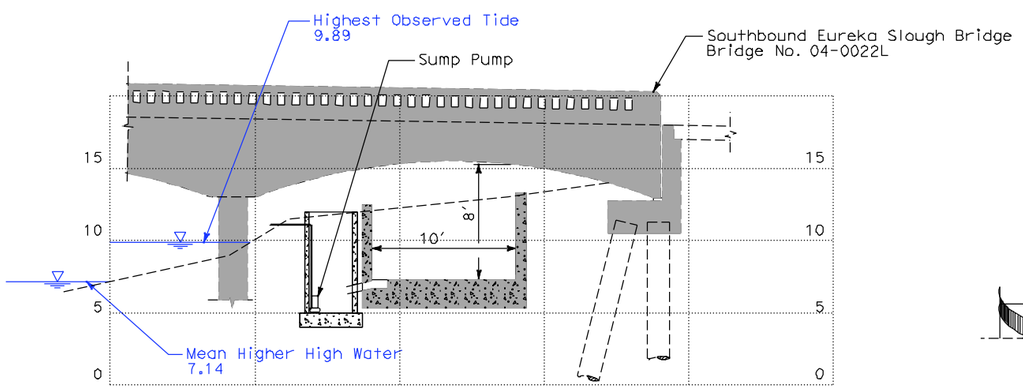

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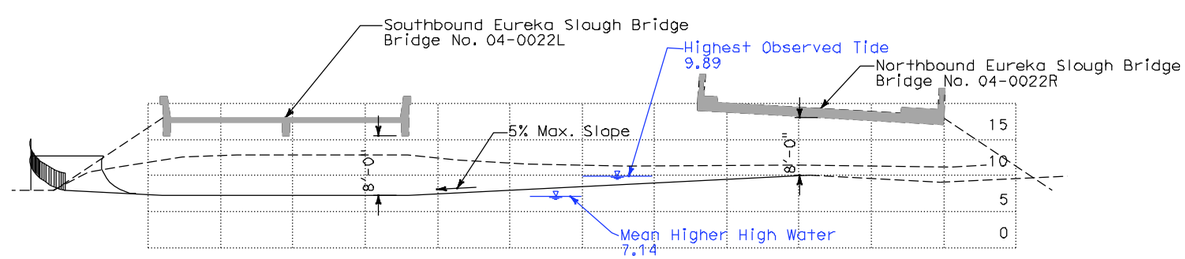

ELEVATION (under bridges)

Scale: 1"=20' H & V

JACOBS AVENUE PEDESTRIAN TRAIL AND UNDERCROSSING

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DATE PLOTTED => 18-JUL-2012
TIME PLOTTED => 09:48

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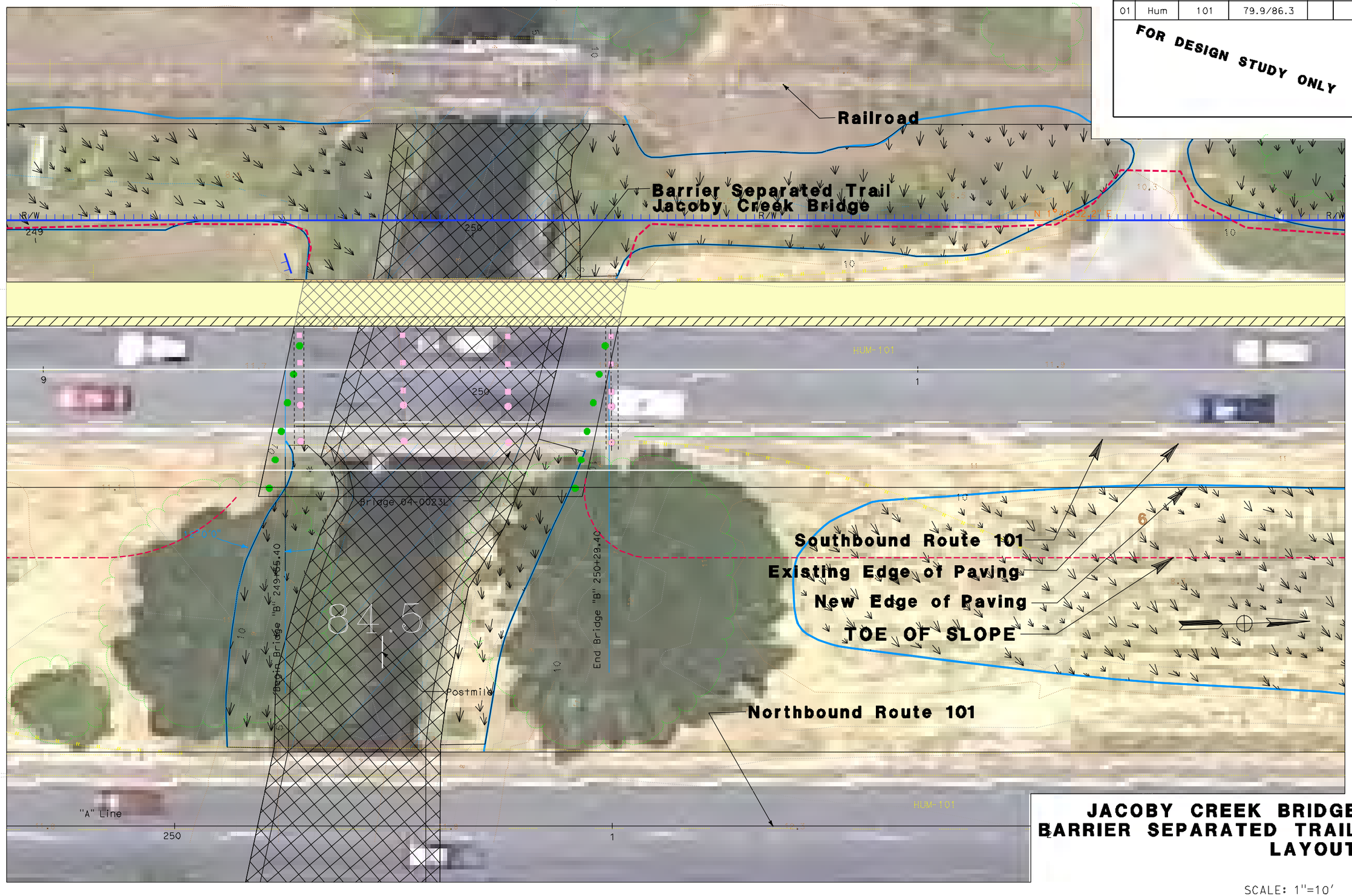

JACOBY CREEK BRIDGE BARRIER SEPARATED TRAIL LAYOUT

SCALE: 1"=10'

REVISED BY	DATE REVISED
TODD LARK	

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FUNCTIONAL SUPERVISOR: L.R. ASHLEY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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LAST REVISION 08-11-08 | DATE PLOTTED => 20-JUL-2012 | TIME PLOTTED => 09:47

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s119316 | DGN FILE => trail-jacoby-ck.dgn | CU 03232 | EA 363301

NELSON
NYGAARD

MEMORANDUM

To: Jessica Hall and Jennifer Kalt, Humboldt Baykeeper

From: Michael Moule, PE, TE and Magnus Barber

Date: August 6, 2013

Subject: Eureka-Arcata Route 101 Corridor Improvement Project Review

PROJECT BACKGROUND

California Department of Transportation (Caltrans) has proposed alterations to approximately 6 miles of the Highway 101 Safety Corridor between Eureka and Arcata, CA. The Safety Corridor is a 50-mile per hour rural divided highway. Bicyclists and pedestrians use the corridor's shoulder to commute, recreate, and tour the coast. Businesses and feeder roads access Highway 101 primarily from the east, with openings in the highway's median to allow for crossings. Old Arcata Road and Highway 255 are significant streets that connect Eureka and Arcata, through farmland, natural habitat and residential areas. Crash rates prior to the installation of the Safety Corridor were above the state average at Indianola Road and the Mid-Cities Motors access road. Crash rates at other crossings are within state averages, despite weather events, such as a fog, that impact visibility.

Caltrans has proposed several alternatives to address the crash rate along this corridor and meet other project goals. The preferred alternative would close medians at most access locations, install an interchange at Indianola Cutoff, and a partially signalized intersection at Airport Road / Jacobs Avenue. Other alternatives studied included the installation of up to six (6) traffic signals at the access locations.

Humboldt Baykeeper asked Nelson\Nygaard Consulting Associates to review background data, assess some of the alternatives proposed by Caltrans, and recommend other possible alternatives. This memo summarizes the findings of this data review and alternatives assessment.

DATA REVIEW

Observations of Existing Conditions

General Observations

Route 101 between Eureka and Arcata is a 4-lane rural divided roadway with a wide median; sometimes called a rural "parkway" design. The shoulders are typical fairly wide (about 8 feet), with a ground in rumble strip under the edge line. One notable exception is the bridge for the northbound lanes over the Eureka Slough – this bridge is older and has a 2-foot shoulder. It also has a 4-foot sidewalk, which is suggested for bicyclists to use, via shared lane markings as shown in the picture below.

Exhibit 27
Moule and Barber
Traffic Study

Roadway Continuity

The conditions at each end of this corridor are important, since the context of Highway 101 varies significantly as it travels through Eureka, Arcata, and the rural areas surrounding these cities. In Eureka, Highway 101 is a one-way couplet on 4th and 5th Streets through downtown, a very urban condition. Northbound 101 is on 5th Street, which is primarily a 3-lane one-way street. Southbound 101 is on 4th Street, which is primarily a 2-lane one-way street. In Arcata, Highway 101 is a limited access freeway, starting just north of Bayside Cutoff and continuing north for more than 20 miles. In the existing condition, the project corridor provides a reasonable transition between the downtown urban street context in Eureka and the limited access freeway context in Arcata.

Intersection and Driveway Access

This corridor has seven access points as follows:

- Two "cross" access points that have connections on both the east and west side of the highway. Both of these access points allow all turning movements, but are not at public streets but rather for private properties typically with industrial land use.
- Two "T" access points have roadway connections on the east side, connecting to the larger street network (Indianola Cutoff and Bayside Cutoff). These both allow all turning movements to just the one side.
- Two "T" access points that allow all turning movements for access to private properties on the east side of the highway (Airport Road/Jacobs Avenue and access for the car dealerships.
- One "T" access point that allows only right turn movements at the south end of Jacobs Avenue, providing access to several private properties. Left turn movements are currently made at the access where the north end of Jacobs Avenue connects to Airport Road.

All access points are one-way or two-way stop control, so that Highway 101 has free-flow traffic, and the side streets or driveways have stop control.

From a bicycling perspective, the existing access points are both good and bad. Full movement access at most locations means that bicyclists can arrive at and depart from destinations without any out-of-direction travel. On the other hand, the unsignalized intersections introduce potential hazards for bicyclists. Bicyclists making left turns at the access points must navigate across two

lanes of traffic, which at times likely has only a few gaps. Bicyclists traveling on the highway shoulder are potentially endangered when motorists turn onto or off of the highway, especially when motorists make left turns. A common bicycle-motor vehicle crash type occurs when motorists turn left to or from a minor street or driveway; drivers are primarily focused on other motor vehicles and sometimes miss seeing a bicyclist, resulting in a crash.

Alternative Routes for Bicyclists

There are two alternative routes for bicyclists connecting Eureka and Arcata. If bicyclists find that travel along Highway 101 becomes more circuitous and/or less safe, these alternate routes become more important connections:

- Highway 255 provides an alternative to 101, but it is a more circuitous route (about 1.5 miles or 20% longer). It has lower traffic volumes and therefore might be a more desirable route, but it does have narrower (but sufficient) shoulders and a higher speed limit along most of its length than the Safety Corridor on Route 101.
- Myrtle Avenue and Old Arcata Road provide another alternative, but this route is even more circuitous, about 4 miles or 50% longer, and has some elevation changes in terrain. Again it has lower traffic volumes and narrower, but sufficient shoulders. For many recreational cyclists, this route might be preferred due to the more varied terrain, but it is the longest of the three routes. The most circuitous part of this alternative is along Myrtle Avenue near Eureka. Many cyclists likely choose to ride Highway 101 near Eureka, and then use Indianola Cutoff or Bayside Cutoff to connect to Old Arcata Road. This may be especially true since 101 becomes a limited access expressway north of Bayside Cutoff. Using 101 and Old Arcata Road reduces the extra distance dramatically to either about 1 mile (about 10%) if Bayside Cutoff is used, or about 2 miles (about 25%) if Indianola Cutoff is used.

Distances from downtown Eureka to downtown Arcata

Route	Length in Miles	Percentage Greater Than the Direct Route on 101
US 101	7.7	0%
California 255	9.1	18%
Myrtle Avenue + Old Arcata Road	11.6	51%
US 101 + Indianola Cutoff + Old Arcata Road	9.6	25%
US 101 + Bayside Cutoff + Old Arcata Road	8.6	12%

Review of Background Studies, Memos, and Reports

November 2005 Traffic Study Report

In this study, the discussion of the alternatives with signals at Airport Road indicates that there would be separate signal phases for Jacobs Avenue and Airport Road. Providing two signal phases for traffic on the east side of Route 101 could significantly increase the amount of time that traffic on Highway 101 is stopped, delaying traffic on 101 a significant amount, and potentially driving the “need” for more through lanes on 101. In order to maintain the fewest possible lanes on Route 101, it is recommended that only one signal phase be provided for these two streets. This may require geometric changes to these streets, as shown in several of the background documents.

DEIR 2007

This document discusses many of the safety reasons for the proposed alternatives, including eliminating uncontrolled left turn movements to or from Route 101, and also reducing left diverge and merge movements. With respect to left merge issues, this document states the following on page 5 of chapter 1:

> "A left-merge movement is one where traffic on an acceleration lane merges into, or a deceleration lane merges out of, the main flow of traffic from the left-hand side of the road. This can be an unexpected move to motorists since more than 95% of highway merge movements are right hand merges. Left-merge movements have much higher collision rates than that of right-side ramp exits and entrances. Of the total number of rear-end, sideswipe and overturned vehicle collisions occurring at intersections along Route 101 from 1994 to 1999, three times as many occurred in the left lane as the right. The American Association of State Highway and Transportation Officials (AASHTO) 2001 publication "A Policy on Geometric Design of Highways and Streets" states: "Left-side main roadway exit ramps should be avoided because they may appear to be a right side entrance ramp to a confused motorist." and later in the guide: "Left-hand entrances and exits are contrary to the concept of driver expectancy when intermixed with right-hand entrances and exits. Therefore, extreme care should be exercised to avoid left-hand entrances and exits in the design of interchanges."

The concern about left merge movements for the Safety Corridor is perhaps a bit exaggerated. The discussion about the ratio of crashes occurring in the left lane is relevant, although this may or may not be due to left merges. Additionally, the quotes from the AASHTO document (commonly referred to as "the Green Book") are excerpted from the chapter about "Grade Separations and Interchanges." This reference would fully apply if this roadway is or will be a limited access freeway. But for unsignalized or signalized intersections, the concerns about left merges and diverges are not as great as they are for limited access freeways. On highways that are not limited access, there is more driver expectation for "friction" along the roadway, including vehicles entering from the left side. This isn't to say that left merges are completely unproblematic, but perhaps not as bad as the document is making it out to be. For example, when comparing a fully signalized intersection with the Continuous Green T Intersection alternative suggested later in this memo, the tradeoff for southbound 101 is between signal control and occasional vehicles merging into the traffic stream from the left. A traffic signal is likely to be associated with more frequent crashes than the vehicles merging in from the left.

Memo from Troy Arseneau to Kimberly Floyd, July 17, 2012

On page 3, this memo discusses pedestrian crossings at signalized intersections as follows:

> "Another major disadvantage to a "signalized boulevard" alternative would be in facilitating pedestrian traffic across U.S. 101 mainline. In the District 1 Traffic Operations modeling effort, it was assumed that pedestrians would be allowed to cross U.S. 101 mainline at the Indianola Cutoff intersection, with only one crosswalk crossing U.S. 101 being allowed at the intersection. Under this scenario, mainline traffic delay was found to be greatly increased by each pedestrian call due to the large pedestrian crossing distance. Ideally, pedestrians would only cross one direction of U.S. 101 at a time, make an additional pedestrian call (push the pedestrian button) once in the median pedestrian refuge area for the crossing of the opposing mainline travel lanes, and then wait for the next pedestrian phase to occur to finish crossing the highway.

> Challenges would exist by having a raised pedestrian refuge in the U.S. 101 median because of the speeds on mainline U.S. 101. Per the Highway Design Manual, Sixth Edition, California Department of Transportation, Index 405.4 (2), "On facilities with speeds over 45 mph, the use of any type of curb is discouraged," meaning that a raised pedestrian island in the median would not be desirable and less likely to be deemed "acceptable" by Caltrans Headquarters geometrician and traffic liaisons.
>
> Not having a raised pedestrian refuge island would place pedestrians at considerable risk of being struck by vehicular traffic. This would force the need to have a long enough pedestrian phase (about 45 seconds) to ensure that pedestrians could cross both directions of mainline traffic causing considerable delay to mainline traffic. Our engineering analysis used the pedestrian walking speed of 3.5 feet per second as recommend by the California Manual on Uniform Traffic Control Devices, 2012 Edition, California Department of Transportation, Page 948, and required by Caltrans Traffic Operations Policy Directive 12-01, dated March 30, 2012."

It is true that a curbed roadway is discouraged by Caltrans guidelines, but this doesn't necessarily make it impossible to allow pedestrians to cross the roadway in two stages. A pedestrian walkway could be placed in the median, connecting the two legs of the crosswalk. Waiting on this walkway in the wide median is probably not less safe than waiting at the outside edge of the roadway to cross, with or without a raised curb. At 50 mph, no curb is sufficient to adequately deflect an out-of-control vehicle that is running off of the road. But even if the signals are designed to allow pedestrians to cross all of Route 101 in one signal phase, it is unlikely that pedestrian signals would cause significant delay along the corridor. This is due to the fact that pedestrian usage is very low in this area, and this is unlikely to change unless there are significant changes in land use. It is true that providing signal timing for pedestrians to cross an eight lane roadway would result in a long delay for motor vehicles each time a pedestrian pushes the button to actuate the signal. However, the pedestrian signals would likely only be actuated a handful of times per day, so the overall effect on traffic flow on 101 would be small.

On page 5, this memo includes a long statement about the interchange not increasing capacity. It even states: "While the interchange will no longer require vehicles entering the highway from the minor streets to have to stop (but will have to yield upon entering U.S. 101) as they will be able to merge onto the highway at the interchange, the interchange will not increase highway capacity on either U.S. 101 or the minor streets." As noted above, an interchange absolutely increases the capacity for the minor streets. Today, due to high volumes on Highway 101, the capacity for left turns from the minor streets is quickly approaching zero, so it is not surprising that the Caltrans studies reported Level of Service (LOS) F for westbound and eastbound left turns from the side streets and driveways, even those with low volumes of left turning vehicles.

On page 6, this memo refers to the California Coastal Commission staff report: "A statement was also made indicating that the project will "speed up" traffic and make it less safe for bicyclists and impact the bicycle trips length." Troy Arseneau responds to this by stating, "This statement is incorrect because the project geometrical improvements, in themselves, will not cause an increase in vehicular speed on U.S. 101. In addition, speed limits are determined in a separate process, which is mandated by the California Vehicle Code and the California Manual on Uniform Traffic Control Devices (CAMUTCD)." The statement that the geometric changes will not cause an increase in vehicle speeds is likely inaccurate. A roadway with fewer access points, fewer uncontrolled left turn movements, and longer merge and diverge lanes will generally result in faster vehicle speeds, compared to the existing highway with unsignalized intersections that

create "friction", which likely reduces motor vehicle speeds. Without left turn conflicts, drivers will experience less friction and will tend to go faster. The reference to speed limits is meaningless because speed limits have little effect on actual travel speeds, unless significant enforcement is provided (as with the Safety Corridor). But it is quite likely that speed limits will increase because the current speed limit is set artificially low due to the safety corridor. As Troy Arseneau stated, CVC and CA-MUTCD standards require speed limits to be set in response to higher measured speeds on the corridor, which is the likely result of reducing friction through the project's proposed improvements.

Letter from Kimberly Floyd to Mark Delaplaine July 25, 2012

This letter includes the following quote: "The construction of an interchange does not increase the capacity of a highway segment." This is not entirely true. It could arguably be true for through movements, but absolutely not for turning movements. The capacity of the proposed interchange is undoubtedly higher than the capacity of the existing stop-controlled intersection. This is evidenced by the LOS F ratings shown for left turning movements in the traffic studies for the project. The reason that these left turn movements show LOS F isn't necessarily because there are a lot of vehicles turning left, but rather because there are so many vehicles on Highway 101, that there are few gaps for left turning traffic to turn across the traffic stream. Consider that if in theory the volume on 101 increased to a point where there are no gaps in the traffic stream, then the left turn capacity would be zero. With an interchange the left turn capacity isn't affected by the through volume on 101 in the same manner. It is MUCH higher.

Coastal Consistency Addendum February 2013

On page 13, this document states, "It would not be appropriate to allow pedestrians to cross Route 101 at each intersection in the corridor." By law, pedestrians are allowed to cross 101 anywhere along the corridor as long as they yield to traffic on the roadway. Caltrans probably intends that they don't recommend providing designated, marked crosswalks at all of the intersections, particularly unsignalized intersections. If either signalized intersections or roundabouts are used, placing crosswalks is more practical. At signalized intersections, traffic can be stopped to allow an occasional pedestrian to cross. At roundabouts, the reduced motor vehicle speeds make it possible for pedestrians to cross much more easily and safely than across an uncontrolled intersection.

This document also discusses challenges with pedestrian crossings at signalized intersections. On pages 13-14, it states: "Simultaneously attempting to maintain acceptable traffic flow, while providing sufficient time for pedestrians to cross Route 101, would be an untenable goal. In order to maintain an acceptable level of service (LOS) on Route 101, additional lanes are required for signalized Eureka-Arcata Corridor Improvement Federal Coastal Consistency intersections. For pedestrians, the signal timing would be set such that there would be insufficient time to allow pedestrians to cross the widened Route 101 because the additional lanes create additional width for pedestrians to cross. If the signal phase time for pedestrians were increased to provide sufficient crossing time, this would result in traffic delay and lower the LOS for the Route 101 through traffic." As discussed above in response to the memo from Troy Arseneau, pedestrian usage is very low along this segment of Route 101, so the overall delay to traffic on 101 is likely to be minimal. In addition, as discussed later in this memo in the section on the signalized boulevard alternative, the additional lanes may not be necessary.

Traffic Volume Data

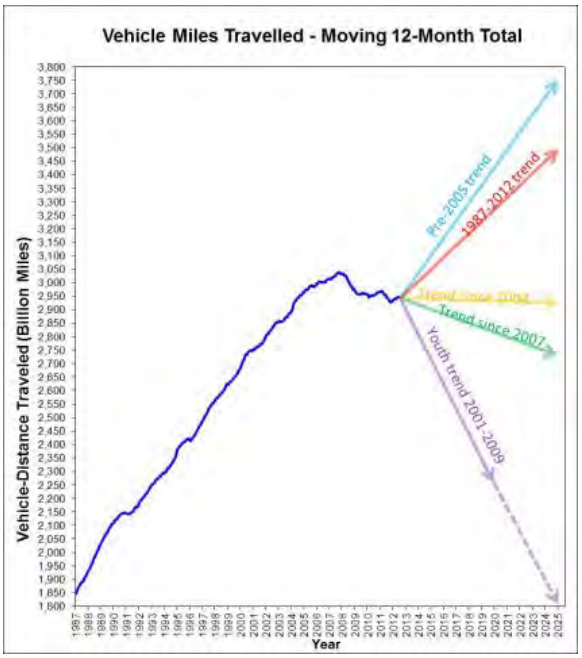
Although there are dozens of background documents and studies that have been provided by Caltrans, thus far very little traffic volume data has been received. There are numerous studies that provide the results of what appear to be very detailed traffic analysis, but the raw count data and detailed analysis results have generally not been received. Thus far, the only actual count data received are total Average Annual Daily Traffic (AADT) for several locations along the corridor, as well as counts of the left and right turning movements at the intersection of Route 101 and Indianola Cutoff.

The turning movement counts at Indianola Cutoff are at the same time both too much and too little information. Caltrans sent a month's worth of counts of all the right and left turning movements at the intersection, at 15 minute intervals. While this detailed 15-minute breakdown is useful to see how turning volumes change throughout the month a typical turning movement count for an intersection such as Indianola and 101 would also include the straight through volumes. As described below in the traffic analysis section of this memo, we have been able to use this detailed information to develop a traditional turning movement count summary for this intersection, but not without some effort and the result is merely an estimate.

Ideally, we would prefer a simple one-page sheet showing the peak hour turning (and through) movements at the intersection, preferably both the existing counts (typically manually counted by a person on site), as well as estimated future counts. Regarding future counts, the main thing we would be looking for is anticipated turning movement (and through) counts based on the change to the road network when the project is built (e.g. when all the left turns are prohibited). They've analyzed this and reported their results, but have not provided the actual count information to easily allow for an independent review.

Increases in Background Traffic

Several of the documents from Caltrans indicate that there will be ongoing traffic growth on the corridor, typically showing an increase factor of 1.4 each year. Using an approximate growth factor has been common practice on projects like this for decades. However, it is critical to note that there has recently been an unprecedented change in the growth in vehicle trips in the United States. The figure at right shows the actual total vehicle miles traveled (VMT) nationwide from 1987 until 2012, with several theoretical trend lines for future years. Since the 1950s until 2004, VMT increased at roughly the same rate (the figure shows this trend from 1987 until 2004. Since 2004, VMT has either grown more slowly or even dropped from year to year. The changes in growth in VMT call into question any predictions on the future growth in traffic on any corridor, including Route 101.



Historical trends for Vehicle Miles Traveled and possible future trends (Sources. Data: Federal Highway Administration. Future trends: interpolated from historical data)

Induced Growth or Development

Many transportation agencies have historically overlooked the potential growth or development inducing effect of roadway construction projects. However, it is now well documented that roadway projects can encourage growth and development, especially projects that increase capacity. But even when the overall mainline capacity isn't increased (e.g. in areas where capacity increases are restricted by the Coastal Act), changes to intersection control can influence future development nearby.

As an example, consider possible signalization of the intersection of Route 101 and Indianola Cutoff or other street or driveway access points to Route 101. The signals on 101 will increase travel time as noted in the Caltrans reports, thus possibly discouraging people from driving on 101, which could have several effects, including drivers shifting to other routes, but also might discourage development in areas that this effects. But on the other hand, right now there is a lot of delay when trying to make a westbound left turn onto Route 101 from the existing access points. Signals at these locations would absolutely make this left turn more convenient, potentially inducing growth on or near these side streets. For the minor streets/driveways on the corridor, signals would absolutely encourage growth on the properties that currently access this stretch of 101, especially compared to the alternatives that eliminate left turns at these locations, which would discourage growth/development at these locations

The installation of roundabouts could have similar traffic inducing effects, and due to lower overall delays might actually induce growth and development more than signals.

SIGNALIZED BOULEVARD ALTERNATIVE

General Evaluation

When compared to other alternatives, the signalized boulevard alternative is by far the worst alternative from an operational perspective. It will result in the most overall delay for traffic on Route 101. From a safety perspective, it falls somewhere in the middle. Traffic signals are better than any alternative that maintains uncontrolled left turns.

But as indicated in several of the documents from Caltrans, signals do result in an increase in rear-end crashes. Therefore, any alternative that eliminates uncontrolled left turn movements without adding signals will be a safer alternative. In addition, reducing the number of signals without allowing uncontrolled left tuning movements will improve safety and operations for Route 101.

Although signals will likely result in more overall crashes than the alternatives that eliminate left turns without using signals, it is important to note that most of these crashes will likely be rear end crashes, which have lower severity than the angle crashes that are currently occurring with vehicles making uncontrolled left turns. This said, it is important to note that signalized intersections also experience angle crashes when drivers fail to stop at red signals. Red light running crashes are relatively rare, but in this case, there are other factors that may result in higher incidence of red light running. The context of this section of highway could potentially negatively affect red light running. North of Bayside Cutoff, Route 101 is a limited access freeway, where drivers expect few interruptions in free-flow conditions. Currently, the Eureka-Arcata segment of Route 101 acts as a transition between the freeway context in Arcata and the urban signalized context in Eureka. Southbound drivers see uncontrolled intersections in this

transitional zone before they encounter their first signal. If a series of signals is installed in this segment, this transition would no longer exist. The northernmost signal and possibly other signals would potentially experience higher than normal red light running incidents. This can be mitigated somewhat by installing warning signs with flashing beacons or changeable message signs, both treatments previously used by Caltrans in similar situations.

Number of Traffic Signals

Based on our experience in traffic design and engineering, it is unlikely that Caltrans would build a Signalized Boulevard alternative with six traffic signals. Many of the minor streets or driveways where signals are proposed have traffic volumes well below the thresholds typically necessary to meet the signal warrants in the California Manual on Uniform Traffic Control Devices (CA-MUTCD). It is highly unlikely that Caltrans would install a series of unwarranted signals. Safety and operational goals can absolutely be met with fewer signals. In fact, safety and operations on Route 101 would both be improved if the proposed signals were replaced with intersections with closed medians, prohibiting direct left turn movements. However, as minor street or driveway volumes increase at intersections with median closures, the inconvenience to users becomes greater, so it is more important to provide full movement intersections.

It is recommended that Caltrans consider a signalized boulevard concept with two to four signalized intersections. If a signalized boulevard concept is to be further considered, here are some considerations regarding which intersections should be signalized, listed with the most important intersections to signalize listed first:

1. Indianola Cutoff: This road appears to carry the most traffic of all the access points to Route 101, and this intersection's location would allow it to serve as an appropriate place to make U-turns for nearby lower volume access points where only right-in, right-out movements would be allowed. If a signalized boulevard alternative is used, we recommend that this intersection be the highest priority intersection for signalization.
2. Airport Road / Jacobs Avenue: This access point serves many businesses of various types, so requiring indirect left turns would make it inconvenient for more users than at other locations. Therefore a signalized intersection is recommended here.
3. Bayside Cutoff: This intersection serves as an important access point to the rest of the roadway network, and would be a useful location for a signalized intersection. There is also a long tangent along Route 101 north of this intersection, which makes the intersection visible to southbound drivers for more than a mile. This would make it easier to successfully notify southbound drivers that there is a signal ahead, as they leave the limited access portion of Route 101. On the other hand it is less important to include a signalized intersection here because Bayside Cutoff connects to the larger roadway network, making a full movement intersection here somewhat redundant with one at Indianola Cutoff. Any users who would prefer to access 101 at Bayside Cutoff could detour to Indianola Cutoff. However, users who want to access Bracut would be served by the ability to make U turns at this intersection.
4. Mid-City Motors: Of the remaining access points, Mid-City Motors likely has the highest volume of traffic entering and exiting traffic Route 101. In addition, the nearest U-Turn location to the north (Indianola Cutoff) would require 3 miles of out-of-direction travel. So a signal might be useful here, although it seems unlikely that signal warrants would be met.

5. Bracut: The traffic volumes at this location likely don't meet signal warrants. Additionally, if signals at Indianola Cutoff and Bayside Cutoff allow for U-turns, then the out of direction travel is not all that significant for users wishing to access the land uses here. It is recommended that a signal not be installed here.
6. Simpson Sawmill: The few land uses accessing the highway at this location likely generates very little turning traffic, so a signal is not recommended here.

Number of Travel Lanes

The following recommendations about number of lanes at signalized intersections are based on the intersection of Route 101 and Indianola Cutoff. This intersection carries the highest overall turning volumes, and is the only intersection that we have analyzed. Given the lower volumes at other intersections, we anticipate that the same number of (or fewer) travel lanes would be sufficient at other intersections as well.

Through Lanes

As described in the traffic analysis section at the end of this document, our analysis indicates that two northbound lanes and two southbound lanes would be sufficient for Indianola Cutoff with existing traffic volumes. Our estimated left turn and U-turn volumes require relatively short green intervals for the southbound left turn and the westbound left turn, which means that northbound and southbound traffic would experience sufficient green time to move the existing traffic in two lanes. To achieve the best level of service for northbound and southbound traffic in two lanes, the optimal signal timing includes a long signal cycle length of approximately 120 to 150 seconds. This results in relatively long average delays and poor level of service for the westbound and southbound left turn movements. However, we recommend this signal timing in order to favor the through movements on Route 101. Long cycle lengths may also reduce the phenomenon of induced development.

Turning Lanes

Northbound

Caltrans has recommended a deceleration lane for the northbound right turn movement at signalized intersections. The use of a deceleration lane is important to reduce rear-end crashes when drivers make northbound right turns during the northbound green interval. We recommend that this deceleration lane be included in the signalized intersection design.

Southbound

Caltrans has recommended a southbound double left turn lane at Indianola Cutoff. Our analysis indicates that a single left turn lane would be sufficient. We recommend that the signalized intersection include only a single southbound left turn lane, and therefore only one eastbound receiving lane on Indianola Cutoff.

Westbound

Caltrans has recommended two westbound left turn lanes and one westbound right turn lane. Our analysis indicates that one westbound left turn lane would be sufficient. We recommend that only a single westbound left turn lane be installed at this intersection, along with a single westbound right turn lane. However, the use of a double left turn lane does not appear to increase wetland

encroachment, and would further reduce the necessary green time for the westbound left turn movement, increasing green time for the northbound and southbound through movements along 101. So if any additional turn lanes are to be added in order to improve intersection capacity, it is reasonable to add this second left turn lane.

Additional Lanes for Future Year Traffic Volumes

Our analysis did not assume any future growth in background traffic along the Route 101 corridor. Caltrans estimated future traffic growth using a traffic model, and this future growth may be a factor, but they have not provided future estimated turning movement counts. In addition, as we noted in the "increases in background traffic" section of this memo, recent trends in traffic growth indicate that there may not be significant growth in traffic in the future.

Another way to look at the "necessary" number of travel lanes is to compare the through capacity of the existing roadway without signals with the through capacity of Route 101 with traffic signals. This may be especially useful since Coastal Act requirements don't allow capacity increases in wetland areas. In their memos on this subject, Caltrans seems to ignore overall intersection capacity, and focus primarily on the capacity for through movements. The appropriateness of using intersection capacity versus through capacity is something that we won't try to address; it is more of a legal question than a technical question. But for the sake of argument, I'll focus on through capacities for the moment.

The recommendation by Caltrans for three through lanes southbound and four through lanes northbound may be an attempt to maintain the same through capacity for Route 101, even though this roadway is not near its capacity at this time. It is true that signalizing through movement will reduce the capacity of each of the lanes, therefore additional through lanes would be needed to maintain the through capacity. However, we believe that the signal timing at Indianola cutoff can be adjusted in such a way that three through lanes would be sufficient to carry the through traffic at the intersection. This is done by providing a long enough cycle length to ensure that the through movements have a green signal for at least 70% of the signal cycle. Given the low turning volumes, this should be possible if a long cycle length is used. If three through lanes are used for northbound and southbound traffic, it should be possible to add a lane on the approach to the intersection, and drop it again after the signalized intersections, as long as signals are installed at only the three highest ranked intersections in the list provided above. Because these signalized intersections are spaced fairly far apart, it would not be necessary to carry three through lanes for the entire length of the project.

Wetland Encroachment

The discussion of travel lanes above addresses minimizing the highway's footprint in this area. Based on our analysis, the existing traffic can be handled with two through lanes northbound, two through lanes southbound, one southbound left turn lane, one northbound right turn lane, two westbound approach lanes (one for right turns and one for left turns, and one eastbound departure lane. This is a total of 13 approach and departure lanes at the intersection, compared to the total of 23 approach and departure lanes shown in the drawing from Caltrans. This is a significant reduction in the highway's footprint.

If three through lanes for northbound and southbound traffic are used in an effort to maintain the existing through capacity, then the total number of lanes would be 17 lanes.

Other Recommendations

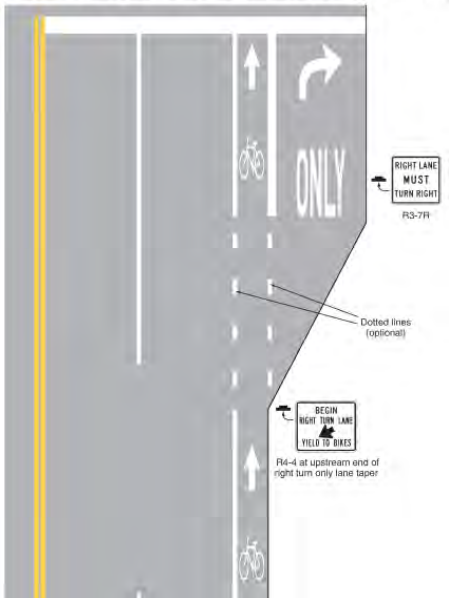
The following recommendations are suggested to minimize crashes, improve traffic flow (maintain existing capacity), maintain pedestrian and bicycle access, and/or reduce wetland impacts.

Pedestrian Treatments

As described above in the review of background documents, it is possible to provide designated pedestrian crossings at the signalized intersections. These could be built as two-stage crossings, where pedestrians cross one direction of Route 101 at a time, or could be built to allow pedestrians to cross all the way across in one phase. Two-stage crossings would reduce the impact on motor vehicle traffic operations, but one stage crossings would provide less delay to pedestrians. Either way, the overall impact on traffic flow is likely to be minimal due to the fact that there are (and likely will be) few pedestrians on this corridor.

Bicycle Treatments

Figure 9C-4. Example of Bicycle Lane Treatment at a Right Turn Only Lane



Because bicyclists can more easily travel long distances, bicycle travel on Route 101 is much more common than pedestrian travel. The signalized intersection design will allow bicyclists to make left turns to and from the minor streets more easily. Left turns from Route 101 are more difficult because ideally bicyclists should merge across into the left turn lane, which requires merging across two lanes of high speed traffic. As indicated in several of the Caltrans documents, this can be a difficult maneuver, especially as traffic volumes increase and there are few gaps in the traffic stream. If a pedestrian crossing is included at the signalized intersections, bicyclists would have the option of stopping at the intersection and crossing Route 101 like a pedestrian.

Another challenge for bicyclists with the signalized intersection design is the right turn lanes. In a typical rural intersection design, there would be a shoulder to the right of the right turn lane, and bicyclists would need to merge across the right turn lane. One solution to this problem in areas where consistent bicycle traffic is expected is to provide shoulder space between the through travel lanes and the right turn lane. This would be similar to the standard bike lane design shown at right (figure 9C-4 from the California MUTCD), except there would be no bike lane markings included.

Continuous Green T Intersection

As described below in the Potential Alternatives section of this memo, we recommend that a Continuous Green T Intersection design be considered for each of the possible signalized intersections. This is essentially what has been proposed at Airport Road in Caltrans Preferred Alternative 3A, and called a “half signal”.

CALTRANS PREFERRED ALTERNATIVE 3A

Caltrans Preferred Modified Alternative 3A includes a full interchange at Indianola Cutoff, and a continuous green T intersection (half signal) at Airport Road.

Indianola Interchange

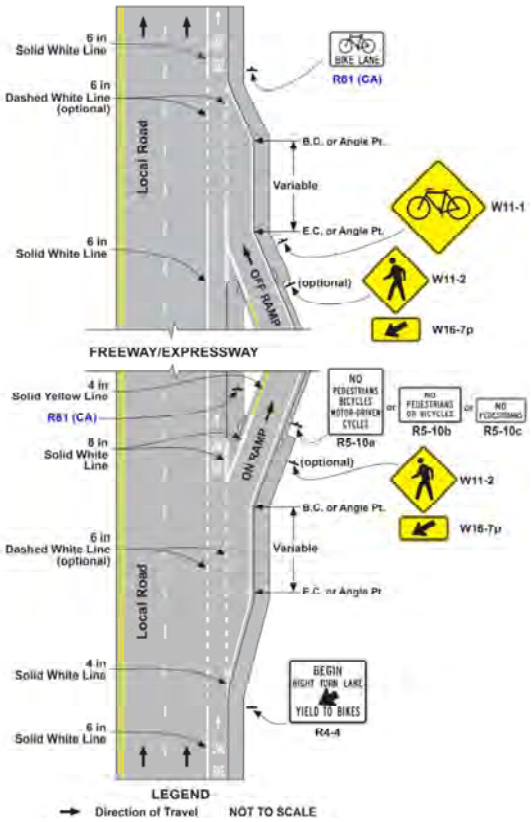
An interchange at Indianola has both positive and negative aspects for all users. This memo doesn't discuss the significant cost of construction, impact on views of Humboldt Bay, wetland encroachment, and several other environmental concerns with the installation of an interchange. This memo focuses on the effects on the roadway users. On the positive side, it eliminates the need for pedestrians, bicyclists, and motorist to cross at grade, thus providing a safer condition for these crossing movements including left turn movements for bicyclists and motorists. On the negative side, the interchange results in out-of-direction travel for all users, as discussed further under Median Closures below.

Interchanges introduce one additional challenge for bicyclists and pedestrians, specifically the high-speed on and off ramp movements by motorists. These concerns are discussed at length in chapter 9 of the Caltrans document Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians. The following is a list of common issues with free-flow ramps from this document:

- Acute intersecting angle limits visibility of pedestrians and bicyclists;
- Crosswalks are not marked across ramps.
- Ramp traffic is not controlled, and motorists traveling at high speed are not likely to yield to bicyclists or pedestrians;
- Bicyclists may not use the best travel path when navigating through the intersection;
- Bicyclists must weave through free-flow turning traffic traveling at a much higher speed.

One mitigating solution to the free-flow ramp problem is to provide bike lanes or undesignated shoulder areas between the right turn deceleration lanes and acceleration lanes, as shown in Figure 9C-103 from the California MUTCD, shown at right.

Figure 9C-103 (CA). Example of Bicycle Lane Treatment Through an Interchange



Median Closures

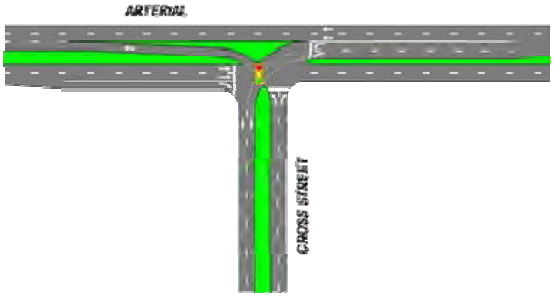
One of the major challenges of this alternative is that it restricts left turning movements to just two locations along the corridor. This will make it increasingly difficult for people to choose to bicycle (or walk) to any of the land uses along this corridor. The theoretical out-of-direction travel

for these users can be considered the same as that calculated for motor vehicles in some of the Caltrans documents. However, when people bicycle or walk, they would be much more likely to choose not to take the circuitous route, and simply cross at random locations along the highway in order to take the shortest possible route; this is simply human nature. If a user is able to physically traverse the median including any guardrails that are used, they are quite likely to do so if this activity will save them a significant amount of time or effort. Design for pedestrian and bicyclists should facilitate movement along direct and simple paths.

POTENTIAL ALTERNATIVES

We propose the following ideas for consideration for the Eureka-Arcata segment of Route 101. We recommend that Caltrans evaluate these alternatives more fully, in order to meet the project goals, minimize environmental impacts, and reduce negative impacts to pedestrians and bicyclists.

Continuous Green T-intersection



This is an alternative design for signalized intersections, where the traffic along the top of the T intersection (in this case southbound Route 101 traffic) would not be stopped at the signal, but traffic in the other (northbound) direction would be stopped in order to allow left turns to and from the stem of the T. The image at right (from the Maryland State Highway Administration (MDSHA)) shows this design (Route 101 would be the "Arterial" as labeled on this image). This design has been proposed by Caltrans for Airport Road as Modified Alternative 3A, called a "half signal." We've chosen to use the term "Continuous Green T-intersection" (CGT) since this is what is used by the Federal Highway Administration (FHWA), and "half signal" is more commonly used for a special kind of pedestrian signal. For more information about CGTs, see the case study from FHWA at this link (http://safety.fhwa.dot.gov/intersection/resources/casestudies/fhwasa09016/). Our recommendation would be to consider the design of CGTs at Airport Road, Indianola Cutoff, and Bayside Cutoff, with closed medians at the remaining intersections and driveways.

Advantages

One major advantage of the CGT alternative is that there would be no southbound traffic signals, until beyond Eureka Slough, which is important due to the fact that southbound drivers have just driven on more than 20 miles of limited access freeway.

Disadvantages

Left Side Merges

One possible disadvantage of a CGT alternative is that it would maintain the situation where left side diverges and merges occur at this intersection. As pointed out in several of the background documents, left merges and diverges are discouraged by Caltrans compared to right merges and diverges. The alternative is traffic signals for southbound 101, which would likely have a much worse safety record than these merges and diverges. In fact, the left side diverge would still be in

place at a signalized intersection. Merging crashes are typically much less severe than the broadside crashes that occur at a signalized intersection when motorists fail to stop at red signals.

Acceleration Lane May Contribute to Wetland Encroachment

Another disadvantage of the CGT alternative is that there would be an acceleration lane along southbound 101 on the south side of each intersection, a feature that would not be necessary for normal signalized intersections. However, there would not need to be a northbound "left" turn lane (actually a U-turn lane) at the intersections. So unless the southbound acceleration lane would need to be longer than the northbound left turn lane, there wouldn't be a significant difference in wetland encroachment between these two alternatives.

Pedestrian Crossings

The CGT alternative does not provide an easy way to provide a pedestrian crossing at the intersections. There are no pedestrian facilities on Route 101 in the existing condition, and pedestrians who choose to cross at the existing intersections must wait for a gap in traffic to cross each direction of travel. As mentioned above in the discussion about the signalized boulevard alternative, signalized intersections allow for an opportunity to provide pedestrian crossings. In fact, the California MUTCD states that "Signal design shall provide for or prohibit pedestrian movements." For CGTs on Route 101, the southbound movement would typically not have a red signal that would provide a time when pedestrians can cross. There is an example of a CGT with pedestrian crossings in San Francisco at the intersection of Lake Merced Boulevard and Brotherhood Way (http://goo.gl/maps/6dZiE). In this case, the southbound traffic on Lake Merced Boulevard is only stopped when a pedestrian pushes the button to cross the street. This works fine in San Francisco where there are many signals nearby, so a red signal is not unexpected by southbound drivers. But on Route 101, introducing a rarely used red signal would likely result in frequent rear end crashes and red light running incidents, endangering pedestrians and other users. The best recommendation we have for this situation is to provide a signalized pedestrian crossing across the northbound travel lanes and the left turn lane to the island between the southbound through lanes and left turn lanes, and then provide a walkway to the edge of the southbound through lanes. Pedestrians would simply cross the southbound lanes when they found a gap, as they would at an unsignalized intersection. The alternative would be to prohibit pedestrian crossings at this intersection, per the California MUTCD.

Bicycle Treatments

For the most part, the CGT design is the same for bicyclists as a fully signalized intersection. The only difference is that it is difficult to provide a signalized pedestrian crossing as described above, so bicyclists would not have the option of crossing at a signalized pedestrian crossing.

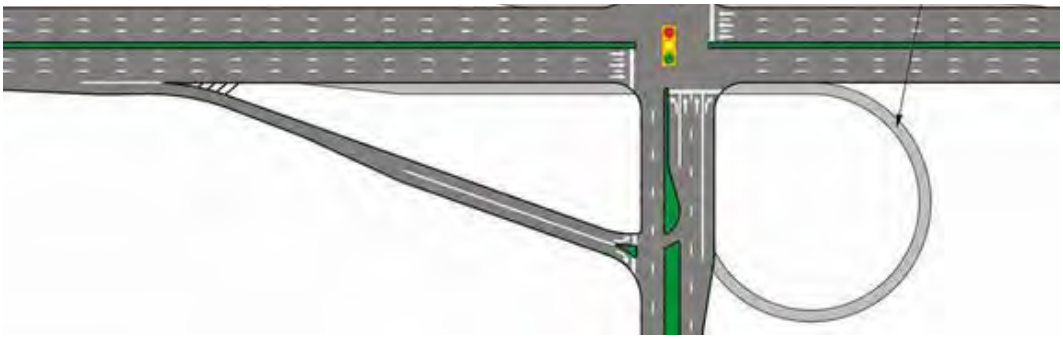
Turning Movements

With the Continuous Green T-intersection, all left and right turning movements would still be possible. Southbound left turns and U-turns would diverge off of southbound 101 to be controlled by the traffic signal, and westbound left turns would go through the traffic signal and then merge onto southbound 101. Caltrans proposed this design for Airport Road but not at other intersections, probably due in part to the desire to allow direct northbound U turns, which are not needed at Airport Road. Indeed there would be no way to allow these U-turns at the intersection. There are several possible ways to allow indirect left turns. Caltrans has already evaluated "Michigan left turns", but this design creates significant wetland encroachment issues, and has

other problems. We recommend evaluation of two alternative methods of providing for indirect northbound U-turns, both of which have the advantage of occurring along the cross streets and not on Route 101 itself.

Jughandle Intersection

This type of intersection provides for indirect northbound U-turns. The image below from MDSHA shows two different types of jughandles. For Indianola Cutoff and Bayside Cutoff, the design shown on the left side of this image is the preferred design, primarily due to limited available land outside of existing wetlands. To make a northbound U-turn, drivers would make a right turn off of Route 101 in advance of the intersection, then a left turn onto the cross street, and then a left turn onto Route 101. The distance between the jughandle connection and Route 101 would be relatively short (about 180 feet), but given the anticipated low volume of northbound U turns at these locations, this should not be a major concern. Drivers making the left turn from the jughandle onto either Indianola Cutoff or Bayside Cutoff would only need to wait for gaps in traffic coming from the southbound left turn movement –the signal would provide long gaps that would easily allow this movement.

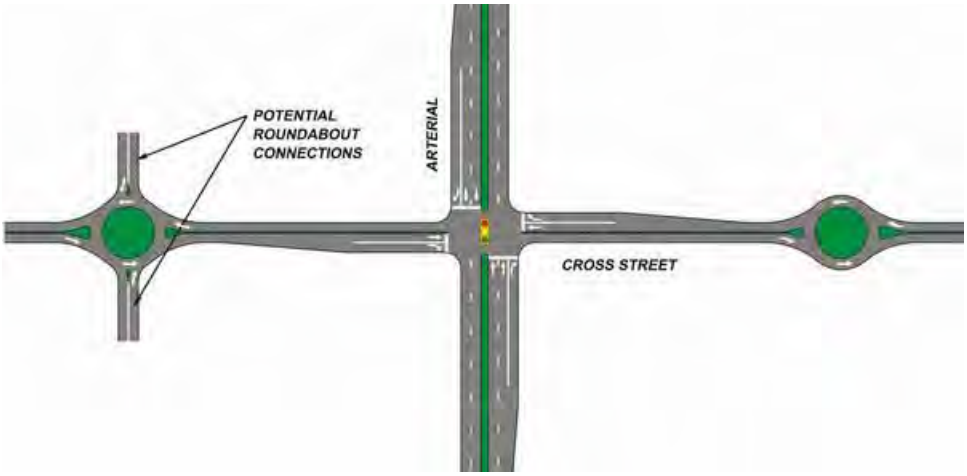


Bowtie Intersection

This type of intersection allows for U-turns at a roundabout (or “fake” roundabout) on the cross street. In this case, there would only need to be one roundabout on the east side of Route 101 (only half of the bowtie). The image below from MDSHA illustrates this solution.

At Indianola Cutoff, it is recommended to evaluate the placement of a roundabout at the intersection of Indianola Cutoff and Indianola Road, east of where 101 Slough crosses underneath Indianola Cutoff. It appears that a roundabout with the necessary 130-foot inscribed circle diameter could be built at this location without significant wetland impacts, and minimal right-of-way requirements, probably just on the north side of Indianola Cutoff.

At Bayside Cutoff, there are two options to evaluate. The first option would include a “fake” roundabout east of the driveway to the residence near this intersection. This option would require a right-of-way on both sides Bayside Cutoff. The second option would include a roundabout at the intersection of Bayside Cutoff and Old Arcata Road, similar to the existing roundabout at Indianola Cutoff and Myrtle Avenue. This option has the disadvantage that this intersection is a half mile away from Route 101.



Roundabout Corridor

In all of the reviewed background information, we did not identify any discussion of using roundabouts along Route 101 itself. There was a mention of a roundabout interchange at Indianola, but nothing on mainline 101. Within the past year, Caltrans has developed a new Intersection Control Evaluation and Selection process that recommends that roundabouts be given more consideration when changes to intersection control are being given. A Caltrans presentation (http://dot.ca.gov/hq/tpp/offices/ocp/ATLC_files/August_2012/6.pdf) about this process identifies several possible performance benefits of roundabouts including the following that are relevant to the Eureka-Arcata segment of Route 101:

- Safety
  - Reduction in Total Crashes by 35%
  - Reduction in Injury and Fatal Crashes by 76%
  - Slower speeds 15-25 mph at and near critical (conflict) area
- Operations
  - Less delay & queuing compared to signalization over a broad range of traffic volumes (for all users)
  - Optimizes intersection efficiency 24hrs a day
- Other
  - Access Management: Facilitate U-turns that can substitute for more difficult midblock left turns.
  - Environmental: Noise, air quality impacts and fuel consumption may be reduced.

Given this, we strongly recommend that Caltrans do a full evaluation of a roundabout corridor along Route 101. We recommend that roundabouts be considered for installation at Indianola Cutoff, Airport Road, and Bayside Cutoff.

Advantages of Roundabouts

Roundabouts have much better safety records than either signalized intersections or two-way stop controlled intersections, as shown in the bullets from the Caltrans presentation above.

Roundabouts would make it very easy for drivers to make U-turns in order to access locations that are anticipated to be restricted by median closures. With roundabouts at the 3 locations

mentioned above, the delay created by out-of-direction travel to the other access points would be less than in any other alternative.

Roundabouts would reduce fuel consumption compared to any signalized alternatives.

When compared to signalized intersections, roundabouts are a much better solution when drivers have just left a limited access freeway corridor. With a signalized intersection, drivers may have to brake abruptly when the signal changes from green to yellow to red. The roundabout is always there and familiar drivers would always expect to have to slow down somewhat as they approach and go through the intersection. In addition, the central island of the roundabout can be designed and landscaped in a way to be very visible to drivers as they approach. In the event of an inattentive driver approaching a roundabout, the resulting crash is typically a fixed object crash instead of a high speed angle (broadside) crash at a signalized intersections (both roundabouts and signals can also have rear-end crashes.

Roundabouts are likely safer than signalized intersections in foggy conditions (a common occurrence adjacent to Humboldt Bay), because the roundabout is always there and slowing is anticipated by familiar drivers.

Because traffic doesn't need to be stopped for a specified time to allow other movements, roundabouts don't typically require additional approach lanes and departure at the intersection. And if additional capacity is desirable at roundabouts, the approach lanes and departure lanes can be quite short, sometimes simply flaring to a wider entry width immediately adjacent to the roundabout. This could result in smaller wetland encroachment than signalized intersections.

Disadvantages of Roundabouts

A full interchange like the one proposed at Indianola Cutoff may improve safety even more than a roundabout.

Roundabouts require slow speeds for through movements regardless of whether or not there is cross traffic. This is one of the reasons that they have a significant safety advantage. However, this slowing results in geometric delay, which would be experienced at each roundabout by every motorist who travels the corridor. On the other hand, stopped delay is typically shorter at roundabouts than at signalized intersections.

Roundabouts require a large footprint at the intersection. In this case, an inscribed circle diameter of 160 to 180 feet is recommended, which is wider than the existing width of the highway. The roundabouts would need to be offset to the east somewhat in order to avoid encroaching into Humboldt Bay, but it appears that the roundabout geometry can be designed to make this work at all 3 locations on Route 101. In addition, in order to provide adequate deflection at the roundabouts, the approach and departure roadways would need to be realigned toward the median of the existing highway, encroaching on the wetlands in the median. These encroachments could easily be mitigated by providing wetlands in the central island as well as the areas vacated by realigning the approach and departure roadways.

Bicyclists at Roundabouts

Roundabouts would serve bicyclists who want to make left turns better than signalized intersections because the roundabouts would make it easier for bicyclists to merge properly to make left turns. Motorists would be physically required to slow to about 20 to 25 mph, a speeds that are much more compatible with bicycling.

The disadvantage for bicyclists is that all bicyclists including through bicyclists would need to merge with motor vehicle traffic in order continue through the roundabout. For southbound bicyclists, it might be possible to provide a bypass bike lane on the west side of the road so bicyclists don't have to go through the roundabout. This bike lane would be physically separated from the roundabout, which would make for a nice environment, but make it difficult to maintain.

Pedestrians at Roundabouts

It would be recommended to simply provide pedestrian walkways in the splitter islands of the roundabout, showing pedestrians where to cross at the safest location. Given the low volume of pedestrians, sidewalks and marked crosswalks probably wouldn't be necessary, although it might be beneficial to reserve space for future sidewalks around the roundabout. Even without crosswalks and sidewalks, the roundabouts would make it much easier for pedestrians to cross Route 101, because drivers would be driving only 20 to 25 mph.

TRAFFIC ANALYSIS

The traffic analysis discussed below is only for the intersection of Route 101 and Indianola Cutoff, as this intersection has the highest turning volumes along the corridor.

Traffic Counts

Caltrans provided turning movement counts for the intersection, collected at 15-minute intervals for nearly an entire month during September 2012. We used data from Tuesdays, Wednesday and Thursdays to find the average morning and afternoon peak hour turning volumes for a typical weekday. Mondays and Fridays were not used, as they are usually affected by weekend traffic.

To generate the missing through movements, we used the 2011 traffic volumes published by Caltrans in the 2011 Traffic Volumes on California State Highways[1] as shown in the table below. We used the "Back Peak Hour" and "Ahead Peak Hour" volumes to add to the average turning movement counts for a weekday in September. When balancing the volumes at the intersection, we always chose the highest volume in order to err on the side of more traffic, rather than less traffic. The resulting turning movement counts are shown on the left side of the figure on the next page.

2011 Caltrans Traffic Counts at Indianola Cutoff

Route	County	Post mile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
101	Humboldt	82.68	Indianola	3,450	38,000	36,000	3,950	38,000	36,000

Accounting for U-turns

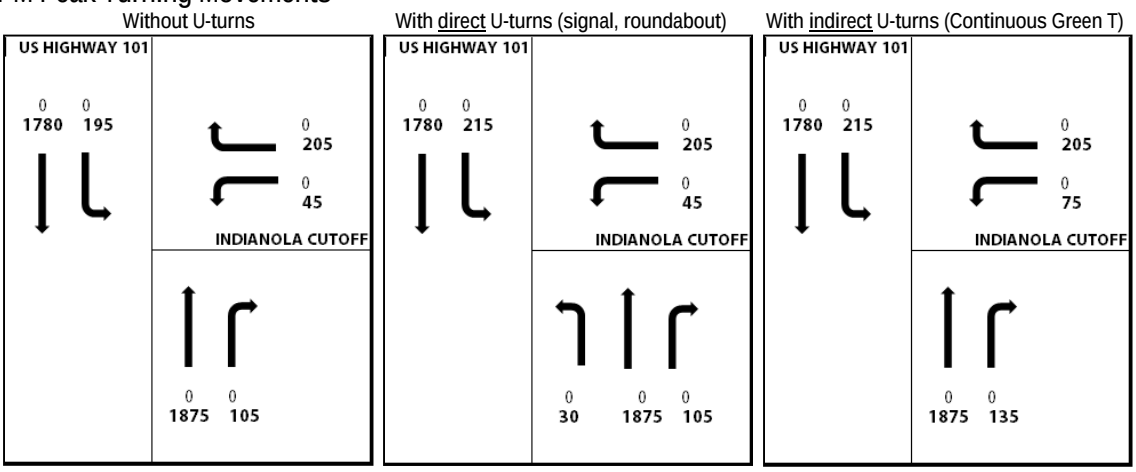
Several of the proposed designs call for closing the median at several intersections and driveways. However, there are properties at these intersections that generate traffic – south of Indianola Cutoff there is a car dealership and a lumber yard, and north of Indianola Cutoff (Bracut) there is

[1] http://traffic-counts.dot.ca.gov/2012TrafficVolumes.pdf

an RV park, bicycle camping, and some industrial uses. With the median closed, people entering or exiting these land uses would need to make U-turns at Indianola. For example, vehicles exiting the car dealership and wishing to turn south would need to first turn north and then make a u-turn at Indianola. For the purposes of this analysis, we assumed that Airport Road and Bayside Cutoff would also be signalized or have roundabouts, allowing left turn and U-turn movements. So no U-turn volumes from these intersections were included in the analysis at Indianola Cutoff.

For the signalized and roundabout alternatives, direct U-turns are possible, resulting in the turning movement counts shown in the middle image below. For the Continuous Green T-intersection alternative, only indirect u-turns would be permitted for northbound to southbound U-turns. That is, first turning right onto Indianola Cutoff, then making the u-turn there, and then turning left back onto 101. We consulted the ITE Trip Generation manual for the land uses at the minor intersections in question, and determined that *at most* these land uses would add 30 northbound U-turns (i.e. 30 right turns and 30 westbound left turns for the CGT alternative), and 20 southbound U-turns.

PM Peak Turning Movements



Scenarios

Three different configurations were tested against the existing design – a conventional signalized intersection, a Continuous Green T-intersection, and a two-lane roundabout.

Continuous Green T Intersection

Two-lane Roundabout

Sources. Left: CDOT/FHWA ©. Right: Nelson\Nygaard and Sidra software.

Summary of Results

Intersection performance was analyzed using Synchro and Sidra, two software packages commonly used in the transportation engineering industry to investigate how intersections perform under varying traffic conditions. Only the PM peak was analyzed, as volumes were overall higher for almost all movements than during the AM peak. For the signalized scenario, the signal timing was optimized to produce the best possible results. As can be seen in the table below, a roundabout would provide the lowest overall delays.

		PM Peak		PM Peak + U-turns	
Intersection	Control Type	LOS	Delay (sec)	LOS	Delay (sec)
Route 101 at Indianola Cutoff	Signalized	B	18.3	C	23.6
	Continuous Green T	B	15.9	B	17.4
	Roundabout	A	9.0	B	11.3

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August 27, 2013

File: 01-HUM-101
PM 79.9/86.3
01-366600
Eureka-Arcata Route 101
Corridor Improvements

Mr. Mark Delaplaine, Manager
Energy, Ocean Resources
and Federal Consistency Division
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Subject: Response to 6/27/2013 CCC Staff Report re: Eureka-Arcata Federal Coastal Consistency Determination/Certification CC-016-13

Dear Mr. Delaplaine:

The California Department of Transportation (Caltrans), on behalf of the Federal Highway Administration (FHWA) and Humboldt County Association of Governments, has prepared the attached response presentation to the 6/27/2013 CCC Staff Report regarding the Eureka-Arcata Federal Coastal Consistency Determination/Certification CC-016-13. This information may be shared with Coastal Commissioners per the Ex Parte Communication requirements.

If you have any questions or require additional information, please contact me at (707) 441-5730.

Sincerely,

SANDRA ROSAS
Branch Chief
North Region Environmental Services Branch E-1

Exhibit 28
Caltrans Response to July CCC Staff Recommendation

List of Attachments
Response document
Digital slide presentation
Traffic simulation.

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Federal Highway Administration (FHWA)

California Department of Transportation (Caltrans)

Humboldt County Association of Governments (HCAOG)

Eureka-Arcata U.S. Route 101 Corridor Improvement Project

U.S. Route 101, between the Eureka Slough Bridge, Eureka

and the 11th St. Overcrossing, Arcata

County of Humboldt

Applicants' Response to California Coastal Commission Staff Report Recommendations dated June 27, 2013 regarding FHWA Federal Coastal Consistency Determination

Consistency Certification No.: CC-016-13

CCC Hearing September 12, 2013

A copy of this response document has been provided to the San Francisco CCC staff and the North Coast District CCC staff.

Executive Summary

The California Department of Transportation (Caltrans), the Humboldt County Association of Governments (HCAOG) and the Federal Highway Administration (FHWA) (the Applicants) provide the information below to the California Coastal Commissioners to underscore and summarize the findings developed over thirteen years of rigorous technical analysis and design revisions that support the FHWA Federal Consistency Determination for the U.S. 101 Eureka-Arcata Corridor Improvement Project (the Project). That consistency determination explains that the construction and operation of the Applicants' Modified Alternative 3A (the Preferred Alternative) will be consistent to the maximum extent practicable with the enforceable policies of the state coastal management program.

Commission Staff recently recommended that the Commission object to the consistency determination. For reasons explained in detail below, Applicants demonstrate that this recommendation is contrary to the facts and the Coastal Zone Management Act (CZMA). First, the purpose of the Project is not to increase the corridor's traffic capacity, rather, it is to reconfigure and upgrade the current facility to reduce the high fatal and injury accident rates that have plagued the Corridor since Caltrans began studying the issue in 2001. In addition, the traffic studies support the finding that the Project, in fact, does not have the effect of increasing traffic capacity. The Preferred Alternative best satisfies this vital purpose while requiring fill of very limited wetlands acreage that is more than offset by the Applicants' mitigation commitments. Second, the Preferred Alternative maintains as low a visual profile as possible so as to minimally impact coastal views from throughout the Humboldt Bay region. Third, it will supply new and enhanced opportunities for connecting the public with low-cost recreation resources within the coastal area. And fourth, due to the existence of a variety of external factors, the Preferred Alternative will not remove any barriers to growth within the coastal area.

I. The Project and the Applicants' Preferred Alternative

The six mile stretch of U.S. 101 connecting the cities of Eureka and Arcata (see Exhibit 1 for Project maps) has seen continued unacceptable levels of collisions since Caltrans initiated its environmental study in 2001. (See Exhibit 2 - collision chart, noting increased frequencies at Mid City Motor World and Indianola.) While the safety corridor signage has provided temporary relief, the efficacy of this program is expected to diminish over time as drivers become accustomed to it and enforcement is defunded.

The primary purpose of this Project is to provide a set of safety enhancements and other improvements to reduce the corridor's collision rate. These enhancements are designed to target the principle cause of the danger — the six, at-grade, uncontrolled intersections within the

corridor allowing for dangerous uncontrolled left-turn movements — without impacting the overall carrying capacity of the road facility.

The Applicants developed several distinct design solutions through rigorous analysis, public comment and years of discussion with Commission Staff, ultimately distilling the commentary to five alternatives. Of these five, the Preferred Alternative emerged as the least environmentally damaging practicable alternative. The U.S. Army Corps of Engineers, Federal EPA, and U.S. Fish and Wildlife Service all concurred with the Applicants' determination. FHWA issued its Federal Coastal Consistency Determination based upon the Preferred Alternative in January 2013.

The Preferred Alternative will result in the elimination of uncontrolled left turn movements within the corridor by closing all of the median crossings. Two of those intersections will then reopen: one of them with a grade-separated interchange and the other with signal improvements. Additional safety enhancements include extension of acceleration and deceleration lanes at these intersections and rehabilitation work to bring the corridor up to current traffic engineering design standards to the extent it is feasible to do so. Corridor safety will also be improved by replacing the southbound Jacoby Creek Bridge, bringing it up to current design standards.

II. Federal Coastal Consistency

The Commission Staff report recommends that the Commissioners object to the FHWA Consistency Determination for the Project. This recommendation follows Caltrans' and the other Applicants' extensive collaboration and consultation with Commission Staff over the last thirteen years, during which the Applicants have worked to avoid, minimize, and mitigate the Project impacts to the Coastal Zone. It is based upon such discussions and other analyses that the Applicants are confident in their claims that the Project can be delivered in a manner that is consistent to the maximum extent practicable with the enforceable policies of the California Coastal Management Program.

There are four bases for the Commission Staff recommendation: 1.) that the Project would impermissibly fill wetlands; 2.) that it inadequately protects public views; 3.) that it does not sufficiently support public access and recreation goals; and 4.) that it would induce growth. The information that follows supports the Applicants' positions with respect to each of these areas of Commission Staff concern.

III. The Project requires limited use of wetlands

The Preferred Alternative will have 10.3 acres of permanent wetland impact. Nonetheless, a project that uses wetlands is consistent with the California Coastal Management Program if it: 1.) qualifies under one of seven prescribed allowable uses, 2.) when there are no feasible, less

environmentally damaging alternatives available, and 3.) feasible mitigation measures are provided that will minimize the effects of the wetlands impacts. The Preferred Alternative satisfies all three tests.

A. The Preferred Alternative is an Allowable Use

Section 30233 of the Act lists the limited allowable uses for filled wetlands including uses incidental to public service purposes. Road projects may serve incidental public service purposes when no better alternatives exist and when the project is necessary to maintain the road facility's existing capacity.

The Commission Staff report states that the Preferred Alternative does not meet these qualifications due to a misapprehension that the grade-separated Indianola interchange will increase capacity. Such claims ignore the traffic engineering analyses completed by the Applicants.

The Preferred Alternative would add no new lanes for through traffic on U.S. 101 or the local streets and thus it cannot be capacity-increasing. Instead, the Preferred Alternative will improve the level of service within the facility's existing carrying capacity. This is just as true at Indianola as it is elsewhere within the corridor. The planned interchange maintains existing capacity as it is designed with single-lane ramps. While there is no other grade separation included within the Preferred Alternative, the presence of a grade separation at Indianola does not belie an increase in capacity as the Staff Report suggests, but rather it is a response to the fact that the existing intersection had the highest collision rate anywhere within the corridor.

While capacity will remain constant, the level of service provided is expected to greatly improve. The improved access for left turning drivers throughout the corridor and especially at Indianola will reduce or eliminate the dangerous and frustrating queues that slow drivers within the existing corridor. These drivers become impatient and choose inappropriate times for completing their left turn movements; a frequent cause of fatal and injury broadside collisions. The rates for such collisions are expected to decline under the Preferred Alternative.

The resulting safety benefits would not just accrue to through travelers, but would also benefit coastal visitors in motor vehicles, on bicycles, and on foot, by providing safer access to coastal resources for all of them. Similarly, the grade separation will provide the best way to safely and efficiently access the Bay Trail being developed for the rail right of way immediately west of the corridor, by providing a connection between the west side of U.S. 101 and Old Arcata Road (see part V, below, for more information about the Bay Trail).

Through these enhancements, the Preferred Alternative is expected to provide a public service (improving safety performance) that is incidental to the primary transportation purpose of the existing facility. The Preferred Alternative would thus constitute an allowable use of the wetlands it will permanently impact.

B. The Commission has recently approved similar projects

The Commission has approved very similar projects for similar reasons in the recent past. The Genesee Overcrossing highway improvement project in San Diego and the Alton Interchange project in southern Humboldt County are two such projects where similar wetland impacts were approved.

The primary purpose of the Genesee Overcrossing project was to accommodate both existing and future traffic. To make these accommodations, the Commission allowed 1.12 acres of wetlands fill because the project was found to not increase capacity. Reviewing the consistency certification, the Commission relied on the fact that the existing overcrossing was a four lane bridge, connecting two six lane segments of Genesee Avenue. The Commission understood that bringing the bridge up to six lanes as well did not increase overall capacity, but instead just removed a local bottleneck from the facility.

As at Genesee, with the Preferred Alternative, the constant number of through lanes is the determining factor for evaluating capacity. In addition, neither project is part of a new route or highway expansion and both are described as "improvements."[1] As at Genesee, the Preferred Alternative constitutes an allowable use for the limited wetlands acreage at issue.

The Alton Interchange project is a highway improvement requiring permanent impacts to prime agricultural lands, another coastal resource protected by the Commission. Impacts of this scale (about four times as large as the impacts of the Preferred Alternative) were acceptable to the Commission because of the improved safety and connectivity with coastal resources that would result from the project. This same rationale is plainly applicable to the Preferred Alternative, where improved safety and access are the intended results of the project.[2]

C. The Preferred Alternative is the Least Environmentally Damaging

The second test for use of wetlands requires the applicant to demonstrate that the Preferred Alternative is the least environmentally damaging feasible alternative available. Caltrans' analyses of alternative designs of its own creation, designs developed through the public comment period, as well as the alternative suggested by Commission Staff, all indicate that the

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[1] The Genesee staff report dated June 14, 2012, stated that "The Commission has in the past determined that the fill for certain highway improvement projects that was necessary to maintain existing capacity was considered to be for an "incidental public service" pursuant to the requirements of Coastal Act Section 30233(a)(4). This finding can be supported for this coastal development permit application on the basis that the proposed project, an interchange and associated freeway improvements, is not part of a new route or highway expansion. In particular, this interchange project does not expand the capacity of the roadway system . . . . which is consistent with the determination that the construction proposed in the subject project is "incidental" to the overall existing highway and roadway facilities. For the reasons set forth above, the Commission finds that the proposed fill is for an incidental public service purpose, and thus **is an allowable use** for placement of fill within a wetland, pursuant to Section 30233(a)(4) of the Coastal Act.

[2] Addendum to Commission Meeting for Thursday, June 12, 2008, North Coast District Item Th21c, CDP Application No. 1-07-038.

Preferred Alternative is the least environmentally damaging solution for addressing the primary project purpose of improving safety within the corridor.

A feasible alternative must meet the primary purpose of the project.[3] Caltrans analyzed the alternative supported by Commission Staff involving a signal at the Indianola intersection (the Signalized Alternative) and found that it would be infeasible.

Caltrans traffic engineers found that the Signalized Alternative would fail spectacularly. Using existing 2013 traffic volumes during the afternoon Peak Hour (4-5 pm), the average traffic queue length for northbound U.S. 101 at Indianola would be about 104 cars or 2,600 feet. The maximum queue would be 120 vehicles long or 3,000 feet. Moreover, closure of the other median crossings for safety would further increase demand at Indianola, lead to longer queues, result in a lower level-of-service, and increase the potential for deadly broadside collisions. In fact, the Caltrans Safety Office has forecast a 45% decline in collisions for the Preferred Alternative against the Signalized Alternative, examining both broadside and rear-end collisions. The likelihood of the latter collision type is increased when a signal is added to expressways in rural settings with high traffic volumes, such as the corridor. The Signalized Alternative would also fail to adequately protect bicyclists and pedestrians who use the facility, as there would be no grade or barrier separation included under the Signalized Alternative. In conclusion, far from enhancing safety, the Signalized Alternative would actually exacerbate the problems that currently exist in the corridor, rendering it *less* safe.

D. The Humboldt Baykeeper's Nelson-Nygaard Memorandum is flawed

Commission Staff largely ignored Caltrans analysis, justifying its decision based on a supposed institutional bias for interchanges and a report compiled at the behest of Humboldt Baykeeper dated August 6, 2013[4]. Commission Staff requested Caltrans respond to the Baykeeper Report and it does so here. As an initial matter, the study was quite rudimentary and deeply flawed, owing to the absence of verifiable data supporting its conclusions (there were no appendices supporting the data claimed, nor was Caltrans ever contacted to provide its data to the reporters). In fact, the traffic volume data that was used in the firm's analysis was not provided anywhere in its report. The report also relies upon specific software programs as they are the only source for certain conclusions reached, and yet there is no evidence that the Humboldt Baykeeper consultant had such software at its disposal. In fact, it is unclear whether the consultant conducted any of its own independent traffic counts.

There were several other flaws to the report. For instance, it is unclear whether the analysis used software default values or the actual parameters used by Caltrans in its signal timing plans (i.e. all red times, yellow times, bicycle accommodation, etc.) The consultant also admitted that it

[3] Office of Ocean and Coastal Resource Management, Consistency Appeal of Chevron USA Inc. from an Objection by the California Coastal Commission (Oct. 29, 1990) (upholding Commission objection to offshore drilling based upon alternative that was consistent with the Coastal Plan and satisfied the project's primary purpose).
[4] Nelson-Nygaard Memorandum dated August 6, 2013

only used existing year traffic analyses, the logic for which is not explained and appears to be inferior to the twenty year planning horizon built into Caltrans designs. The Baykeeper consultant's report actually offered no analysis of future conditions of any kind, nor did the report provide any analysis of the queuing times and distances expected at peak times or the low performance of the overall facility that would result. In general, the Report was vague and unsubstantiated, claiming that the problems Caltrans anticipated would be accommodated through signal timing, yet never identifying what that signal-timing would be.

The consultant's report then concludes by suggesting several more nascent design alternatives, incorporating jug handles, T-intersections, bowtie intersections, and a roundabout corridor, although it fails to provide the information necessary to determine whether the underlying traffic, geometric, or environmental (i.e., wetland impacts) analyses had been performed for any of these suggested alternatives.

Based upon the concerns articulated above, Caltrans could not responsibly disregard its own studies in place of the unsubstantiated claims of the Nelson-Nygaard Report, although that is precisely what Commission Staff has done. That report, containing little more than untested conjecture, is not a sound basis for rejecting thirteen years of project development and design.

E. Feasible Mitigation Will Minimize the Effects of the Wetlands Use

An interagency meeting was held on August 22, 2013, to address CCC staff concerns regarding proposed project mitigation and to come to agreement on appropriate compensatory mitigation for the project. In attendance were representatives from the U.S. Fish and Wildlife Service and the Federal Highway Administration, in addition to CCC Federal Consistency staff (Mark Delaplaine), CCC North Coast office staff (Bob Merrill, Dr. John Dixon), and Caltrans staff and management. The goal of the meeting was to provide recent information of the historical ecology of the Humboldt Bay area with regard to wetlands, providing CCC Federal Consistency staff additional information regarding the mitigation plan and addressing any potential outstanding staff concerns. The outcome of the meeting was positive and meeting objectives were met. CCC staff did request further elaboration on the inability of commercial/industrial sites, previously investigated for mitigation potential, to provide ecologically sound mitigation. Please see Attachment 1 (dated 8/27/13).

IV. Public Views

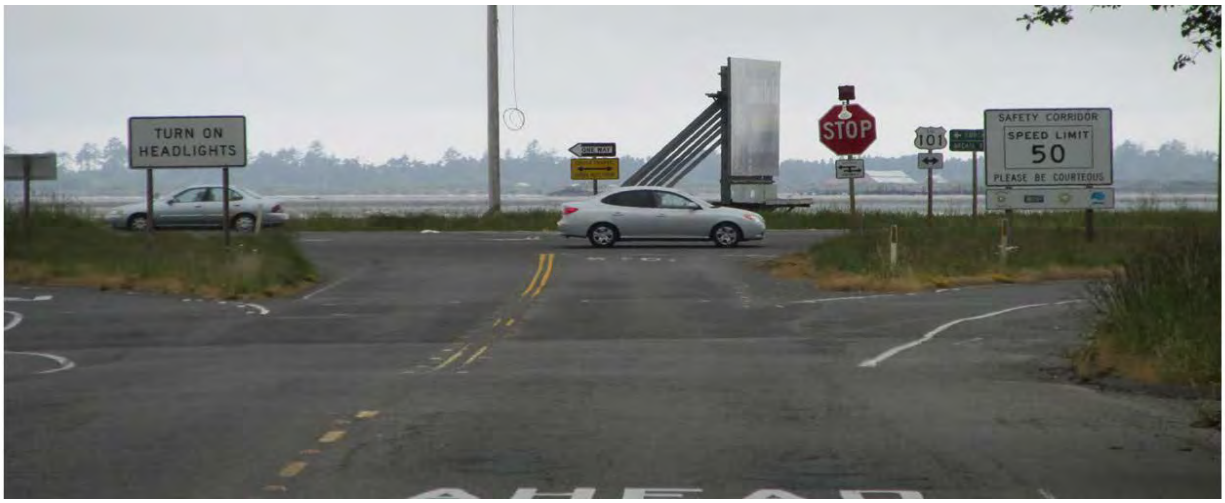
The Preferred Alternative conforms to the standards and policies of the Coastal Act relating to preservation of coastal visual qualities, and such qualities were considered and protected throughout the design development process. Section 30251 of the Act requires that applicants consider and protect visual resources of public importance, minimize alterations to natural land forms, and that a project remains visually compatible with the character of surrounding areas.

The Preferred Alternative satisfies these criteria. Commission Staff's objection to the Project based on purportedly inadequate attention to public views is not supportable under the Section 30251 standards, nor does the Preferred Alternative fail to satisfy the alternative standards that Commission Staff applied instead.

Commission Staff's objections related exclusively to the Indianola interchange, where the height of the facility would block views of Humboldt Bay from westbound Indianola traffic. After stating the statutory standard applicable to public view protection, the Commission Staff Report then proceeds inexplicably to reference Humboldt County LCPs: "while at this stage of the Commission's review . . . local Coastal Programs are not the legal standard of review, the Commission nevertheless looks to the relevant LCPs for guidance in conducting federal consistency reviews." However, Commission Staff examined the Preferred Alternative's consistency with LCPs at some length, and yet Commission Staff failed to note that these LCPs emphasize views *from* U.S. 101 (views which would be undeniably enhanced by the Preferred Alternative's elevation), rather than views *across* it. Thus the Applicants request that if the Commission Staff is going to apply the standards of the LCPs, then they should do so in their entirety.

The Preferred Alternative would also meet the statutory standard of Section 30251. While it is true that the height of the interchange would block the view from westbound traffic on Indianola until it emerges from under the interchange, there are no public viewing areas to the east of the highway that would be negatively impacted by this limitation. The reason for this is fairly obvious from the photographs from the area revealing that the Bay is barely even visible from the eastern side of the highway. There are public viewing areas elsewhere around the Bay, and from those positions, the interchange is not particularly visible due to its low profile and the presence of significantly taller trees nearby.

Commission Staff additionally objects to the scope of earth moving activity to support the elevated interchange. The statute, however, protects "*natural* land forms" (emphasis added), and the landscape of the Indianola intersection is anything but natural. Instead the landscape is the reclaimed result of more than a century of diking and dredging of Humboldt Bay, predominantly to assure the stability of the railroad right of way running parallel and to the west of the corridor. The non-native trees, billboards, the abandoned rail line itself, or the permanently shuttered drive-in theatre in between the right of way and the bay elements of the natural landscape are also unlikely to be regarded as highly scenic. Elsewhere within the Commission Staff report this reality is well understood, as evidenced by the Commissions earlier statement that: "the reality that the 101 corridor between the two cities is both semi-urban and semi-rural environment." This is one of the semi-urban sections, which is not to say that it lacks visual value, but rather that it is a reasonable location for a landscaped interchange. The parties have recently agreed to mitigate for the interchange further by working with the owner, advertiser, and relevant Caltrans organizations to fund the removal of the outdoor advertising display (shown in photograph below) currently blighting this area of the corridor.



Existing View Westbound Indianola Road

Existing View Northbound U.S. 101

V. Public Access and Recreation

The Commission mandate with respect to public access and recreation arises under the Constitution and sections 30213-14 of the Coastal Act. Provisions relating to the Applicants' coastal trail obligations are found at §31408, and in AB 1396 (2007). (§30214(c).) This authority imposes limited requirements upon coastal consistency applicants, urging them to coordinate, cooperate and consult with the Commission and other coastal actors with the aim of developing the Coastal Trail. Absent from the legislative regime is any obligation requiring the Applicants to fund or build the trail. Nevertheless the Applicants are committed to preserving

and enhancing coastal access and recreational activities where feasible and within the project scope.

Commission Staff is concerned that the Preferred Alternative would adversely affect bicycle use by eliminating the median crossings, thereby extending out of direction travel. Commission Staff also anticipates increased vehicle speeds after the Preferred Alternative is completed that could endanger bicyclists.

These are legitimate concerns that the Applicants share, but such concerns are addressed by several of the design features within the Preferred Alternative. Consistent with the Project purpose and need, and in recognition of the unique difficulties faced by the corridor's bicyclists, Caltrans is proposing phased improvements throughout the corridor. The first phase of these improvements shall include shoulder widening to ten feet, lane narrowing at the lane closest to the median for traffic calming, rumble strip and shoulder stripe installation, and colorizing the shoulder to enhance its visibility. During a second phase, the Indianola interchange would allow for a grade-separated bicycle crossing which would all but eliminate the hazards left turning bicyclists currently face. To a lesser extent, but still much improved over the existing conditions, the half-signalization of the Airport Road intersection will also enhance bicyclist safety, as will lengthening of the acceleration and deceleration lanes and widening the southbound Jacoby Creek bridge to accommodate a separated bicycle/pedestrian trail.

The Coastal staff contends that closing the median openings would negatively impact coastal access since it would thereafter require out of direction travel for some bicyclists at certain intersections. While this is undoubtedly true for a limited number of bicyclists, most bicyclists use the corridor as commuters between its two termini.

Commission Staff also expressed concern about the impact of the Preferred Alternative on bicyclist safety. The Applicants assert, however, that the grade separation at Indianola would improve safety and access for all travel modes, especially commuters (both automobile and bicycle) and touring bicyclists. This latter group is regionally served by the popular Pacific Coast Bicycle Route, allowing bicyclists to use the corridor year round to reach destinations as far south as Mexico. The touring bicyclists are also expected to use coastal campgrounds within the corridor area. Lastly, Caltrans is committed to keeping the speed limit at 50 mph within the corridor, insofar as the vehicle code allows. All bicyclists are expected to appreciate the enhanced safe access the Preferred Alternative will provide to coastal campgrounds and other coastal facilities. The Preferred Alternative would accordingly provide a safer environment for accessing coastal resources for both motorists and bicyclists.

Proposed Grade Separation

Grade Separation with future Bay trail

A. The Applicants support the Coastal Trail

Pedestrian access to coastal recreational activities would also benefit from the Preferred Alternative, due to the Applicants' ongoing support of the proposed enhancements of the Bay Trail. Two roughly parallel trails are currently in various stages of analysis or completion around Humboldt Bay. The more easterly of the two would utilize an existing railroad right of way running between the corridor and the Bay (the "Bay Trail"). Commission Staff, however, indicates a preference for an interim coastal trail immediately adjacent to U.S. 101 to serve coastal visitors until the Bay Trail is complete.

While a trail system with several redundancies providing a variety of options for coastal trail users would be a wonderful addition to the bay coastline, such a system is not a feasible addition to this Project. To add an interim coastal trail as Commission Staff advocates, would require an additional twelve feet of paved area (an eight foot trail with two two-foot shoulders) in addition to a two-foot wide and three-foot high concrete separated barrier. This interim solution would cost an estimated $12 million to construct (not including wetland mitigation costs) and consume an additional 7.6 acres of wetlands. The interim trail would therefore be inconsistent with certain values the Commission aims to protect. Furthermore, incorporation into this Project would severely undermine the Bay Trail's future, as HCAOG has stated that it could not support both a Bay Trail and an interim trail.

Commission Staff is reluctant to accept the Applicants' claims concerning the Bay Trail because they understand that trail option to be somewhat speculative. However, this understanding is not accurate. The City of Arcata has already developed plans and has completed the environmental process for 5 miles of the Bay Trail and is planning on breaking ground next summer. The section of the Bay Trail from Bracut to Eureka is in the planning stages and project lead HCAOG is identifying funding sources and will begin the environmental approval process in the near future. In Eureka, the Bay Trail will connect to a series of coastal trails, such as the Elk River-Hikshari trail, which was recently opened by the city. The long-term plan for the Bay Trail project is to provide a bicycle/pedestrian trail from old town Eureka to the Heritage Museum in Samoa across Humboldt Bay. Recent developments reinforce the Applicants' position that the Bay Trail is far from speculative. A recent North Coast Railroad Authority (NCRA) resolution would allow the trail to proceed in the rail right of way under certain conditions, and funding sources are beginning to fall into place.[5] Therefore, the Project proponents will continue to

[5] One plan requires approximately $2.7 million for construction and Caltrans has already committed $1 million for construction of a segment of the rail with trail project. Furthermore, the Caltrans director supports TIGER grant application for the balance of the $2.7 million needed. Under this plan, Caltrans will supply staff assistance for NEPA approval and to supplement the trail system with elements from the Preferred Alternative, including a separate bike and pedestrian path on the proposed southbound Jacoby Creek Bridge replacement. Portions of HCAOG's regional local transportation funds are also earmarked for the Bay Trail project, and HCAOG staff have confirmed with Coastal Conservancy staff that work on the north coast 3-year plan will commence in October with the Bay Trail as the top priority. In addition, HCAOG intends to get a sales tax initiative on the ballot in 2016 for transportation funding. If the Bay Trail is not funded by then, HCAOG could include it in the Expenditure Plan.

coordinate and consult with Commission Staff and other interested agencies concerning issues relating to the Coastal Trail in satisfaction of their statutory obligations, but can only expend such efforts in support of the Bay Trail — the more feasible of the options available.

VI. The Preferred Alternative will not induce growth

The Indianola Interchange is not projected to induce growth in a manner inconsistent with the legal standard set forth on Section 30254 of the Coastal Act. Several distinct factors are operating to limit growth and development around the Indianola intersection. The Preferred Alternative's proposal for improving the level of service at that intersection, while not increasing its capacity, will not remove those barriers to growth. Section 30254 provides that:

> New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division; . . . Where existing or planned public works facilities can accommodate only a limited amount of new development, services to coastal-dependent land use, essential public services and basic industries vital to the economic health of the region, state, or nation, public recreation, commercial recreation, and visitor-serving land uses shall not be precluded by other development.

In addition, section 30250 imposes the following restrictions on coastal infrastructure development:

> New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources. In addition, land divisions, other than leases for agricultural uses, outside existing developed areas shall be permitted only where 50 percent of the usable parcels in the area have been developed and the created parcels would be no smaller than the average size of surrounding parcels.

Commission Staff indicated concerns that the proposed Indianola grade separation component of the Project would pose cumulative impact and growth pressures in a manner inconsistent with the requirements of sections 30254 and 30250 of the Act. Commission Staff was also concerned that the Indianola interchange would increase traffic capacity in the rural area of the coastal zone surrounding the intersection.

Caltrans maintains that there are mitigating factors that should address the Commission Staff's concerns: principally, there are other constraints limiting growth at Indianola. For instance, the absence of additional lanes in the Project's design means that the overall system capacity is not expanded. In addition, the land near the proposed Indianola interchange is in Humboldt County's jurisdiction and is zoned for agricultural use. South of the interchange, the land is within the City of Eureka's jurisdiction. Further, the absence of a sewage system makes development impracticable and the high water table makes it likely to stay that way.

Indeed, Wal-Mart, Sam's Club, and Costco have all expressed interest in developing near the Indianola cutoff intersection over past years, but none has done so due to the barrier imposed by coastal development permits in addition to those factors noted above. Such developments, if they did somehow occur, would be consistent with the Act due to the mandate of Section 30001.5, which requires the protection and promotion of a broad array of land uses.

Commission Staff has suggested that improved traffic flow resulting from the interchange would spur modification of zoning restrictions and encourage the installation of a sewer, but to the extent this is true, which is by no means certain, it would be equally true of the Signalized Alternative the Commission Staff has recommended.

Consistent with Section 30254, the proposed Indianola grade separation would not adversely affect businesses vital to the local economy located near the Indianola intersection. In 2010, there was a 0.7 % decline in total wage and salary employment, non-farm employment was down to -.3 % and manufacturing had steadily declined for a decade. In addition, the county has the 18th highest unemployment rate in the state. For the agricultural-zoned properties around the northeast side of Indianola Road, the Project proponent is prepared to explore mechanisms to minimize potential growth pressures or zoning changes as necessary. The Indianola improvements will not lead to growth, but they may provide a lifeline to existing businesses in the area.[6]

In addition, the Applicants are committed to working with the Commission, the County, and the City of Eureka to develop additional and effective mitigation measures through the coastal land use permitting process to assure that development pressures, if realized, do not induce growth around the Indianola interchange. Currently, ideas include creation of easements or imposition of use restrictions to meet these purposes.

[6] Caltrans Economic Analysis Branch. *2011 Humboldt County Economic Forecast*, Sacramento, available at http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2011/Humboldt.pdf

VII. Conclusion

Project proponents have worked in good faith with Commission Staff to address their concerns with the Preferred Alternative. The Project proponents accordingly request that the Commission affirms the consistency determination completed by FHWA, allowing the Project to move forward.

Eureka Arcata US Route 101 Corridor Improvement Project

2013

In Cooperation With

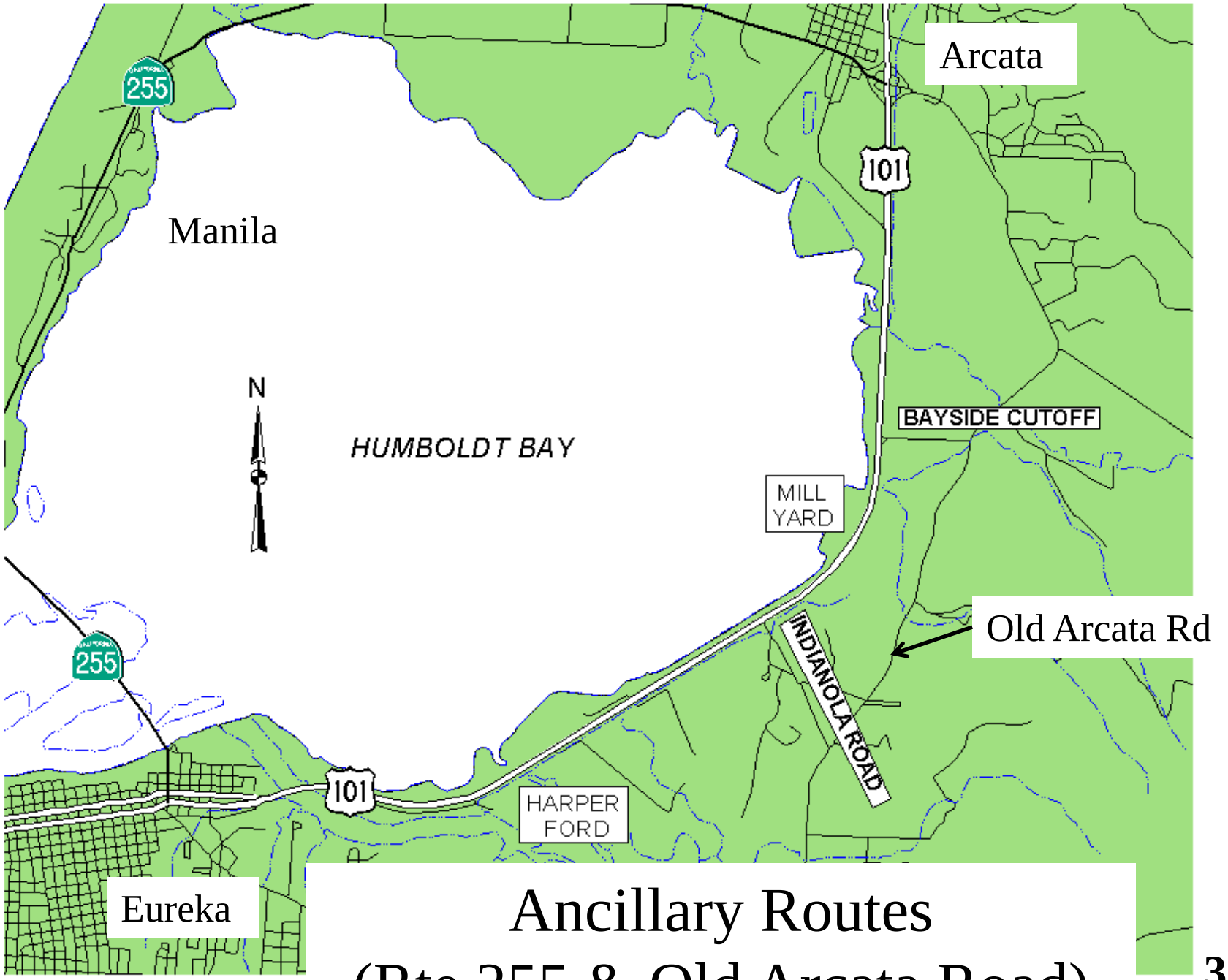
Caltrans

FHWA

HCAOG
HUMBOLDT COUNTY ASSOCIATION OF GOVERNMENTS

Route 101 from Eureka Slough Bridge to 11th Street Overcrossing in Arcata

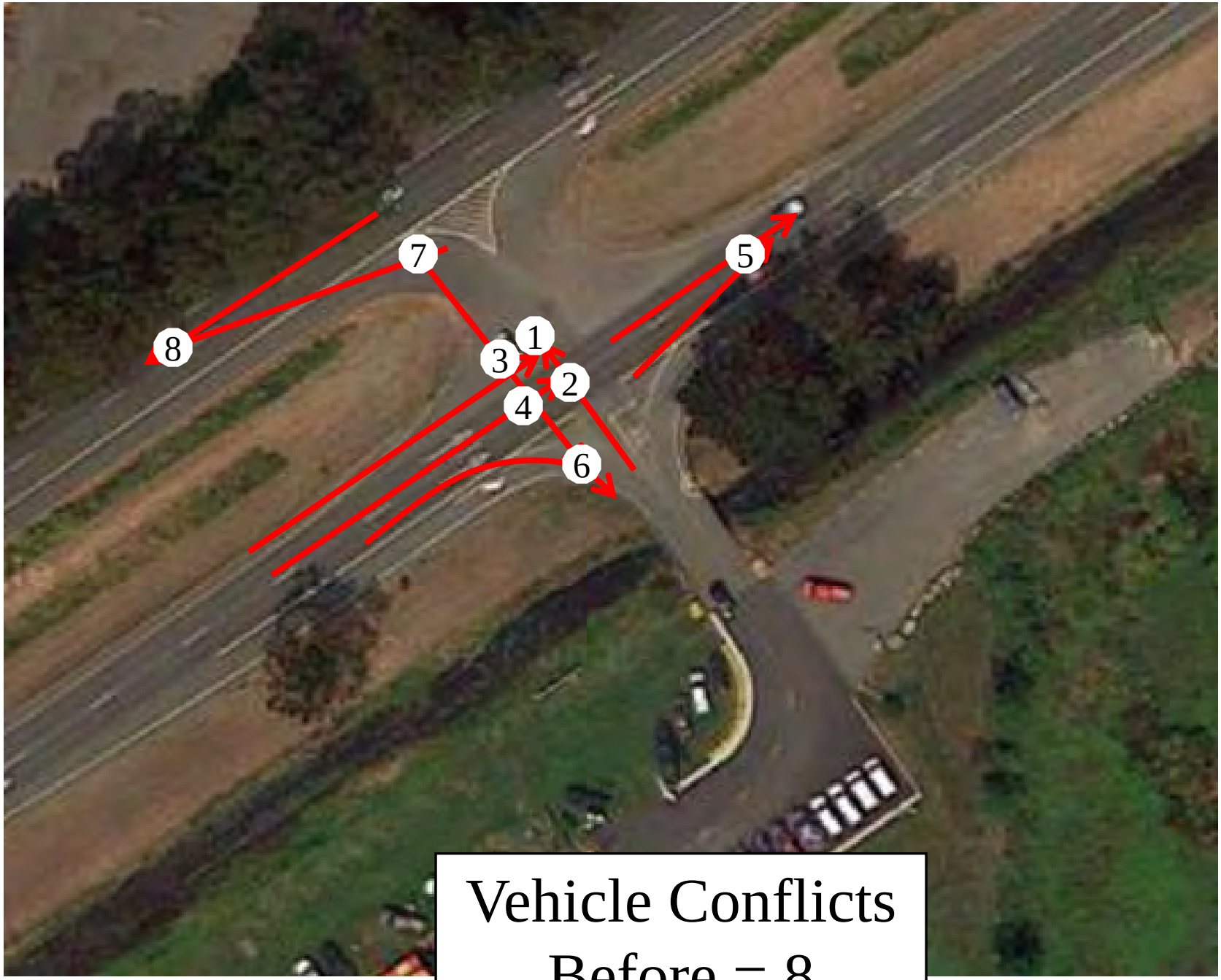
ISSUE – SAFETY & OPERATION OF AT GRADE INTERSECTIONS



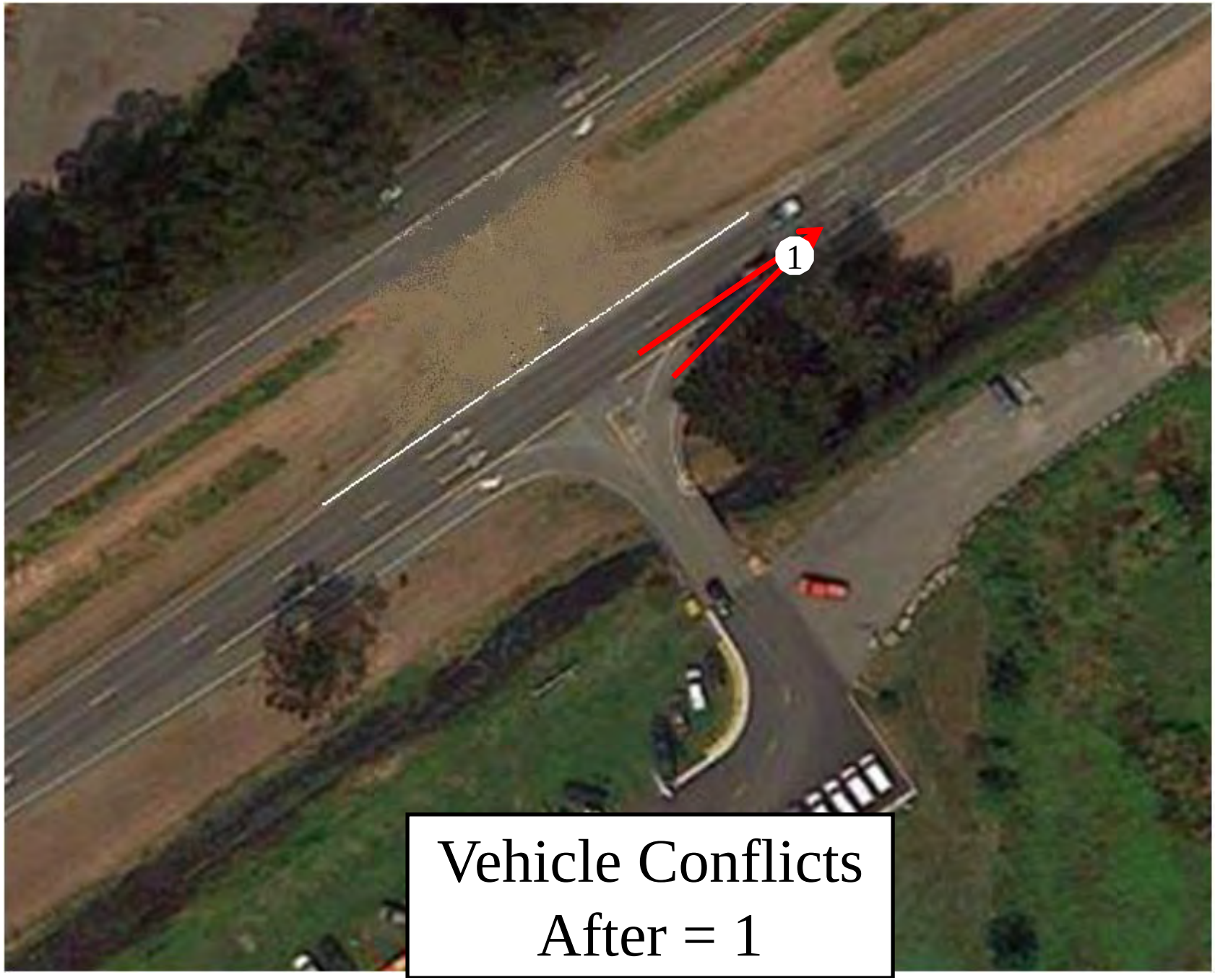
Ancillary Routes
(Rte 255 & Old Arcata Road)

Project Goals

Reduce Operational Conflicts



Vehicle Conflicts
Before = 8



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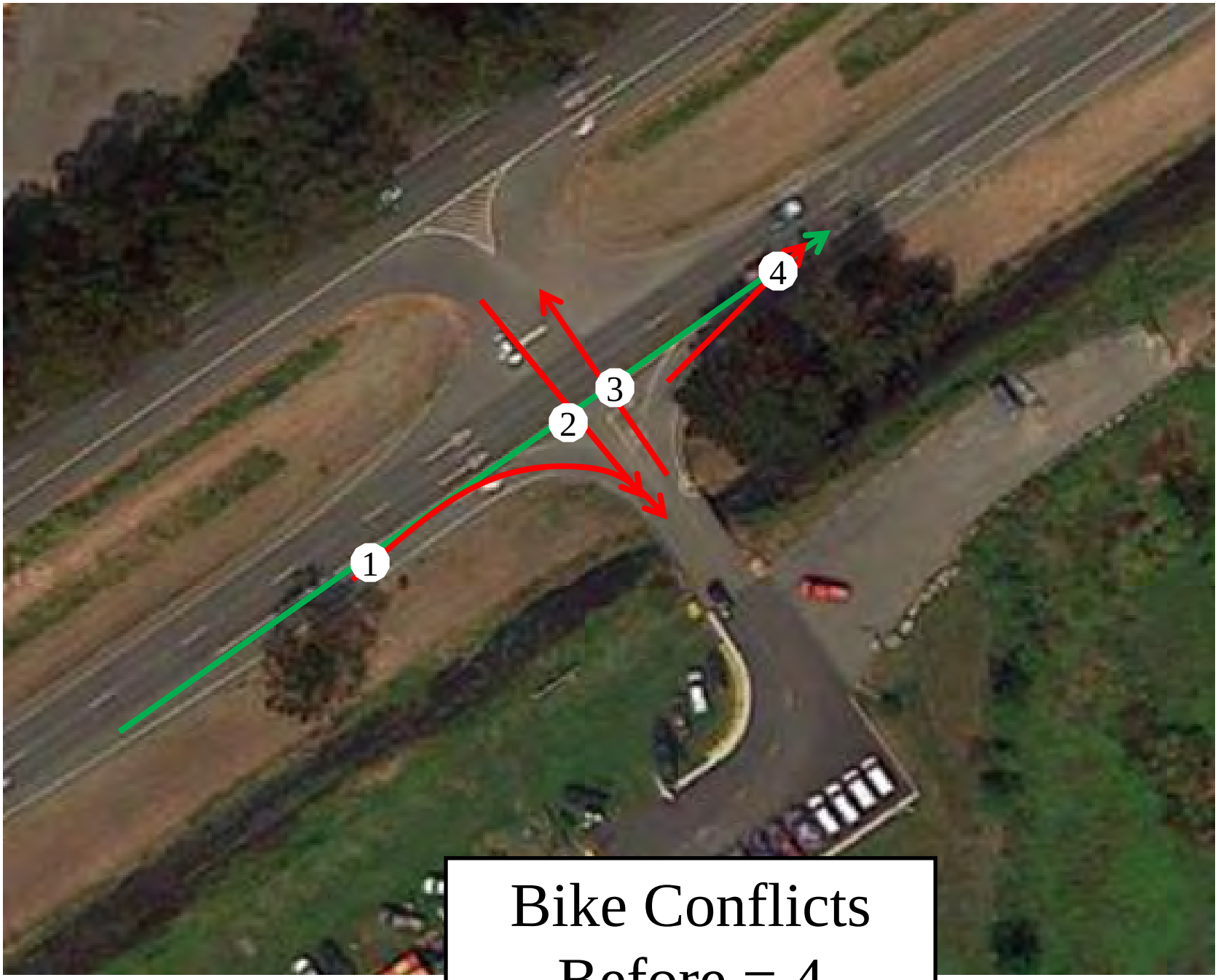

Bike Conflicts
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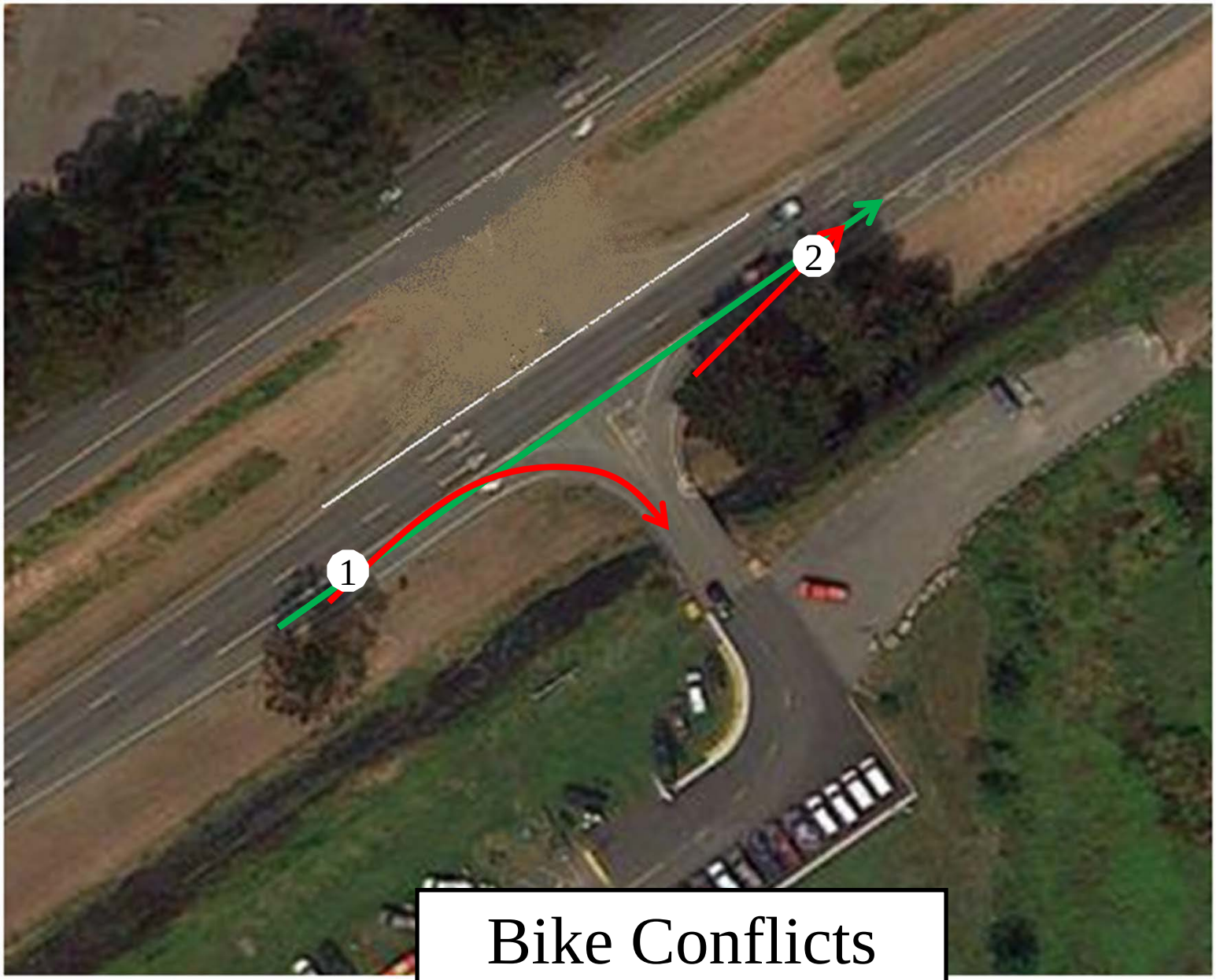
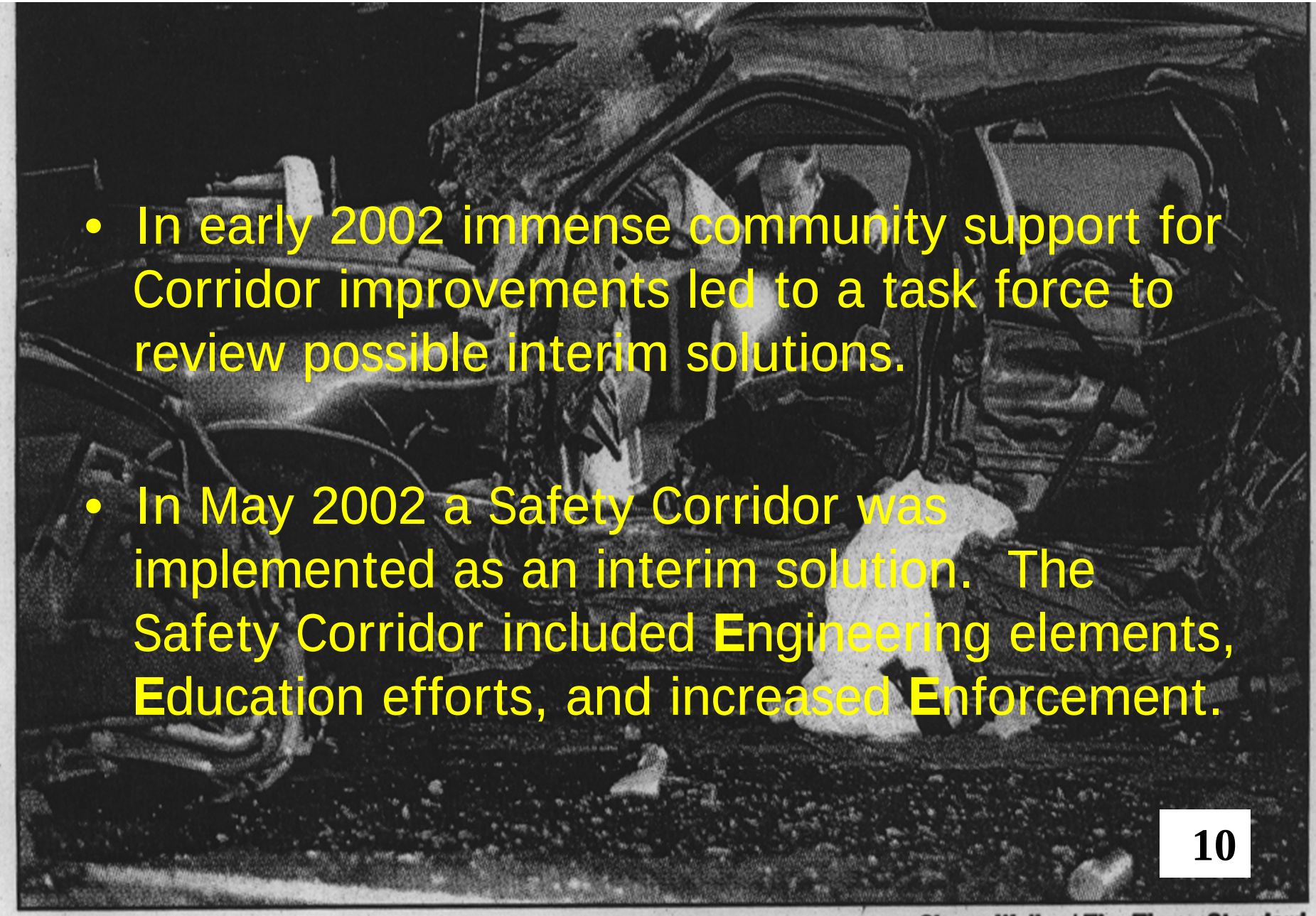


Bike Conflicts
After = 2

Project Goals

Improve Safety at Intersections



- In early 2002 immense community support for Corridor improvements led to a task force to review possible interim solutions.

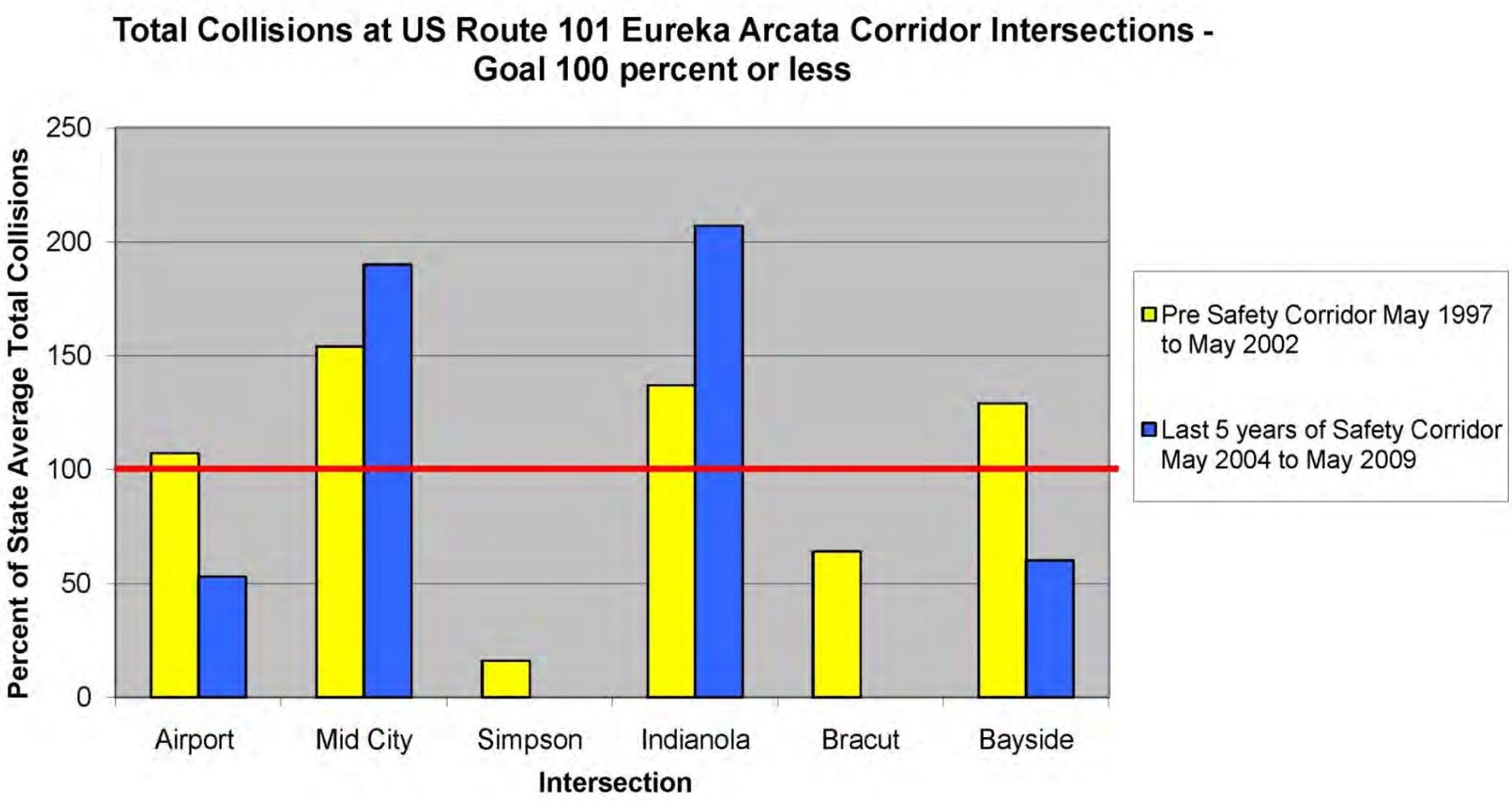
- In May 2002 a Safety Corridor was implemented as an interim solution. The Safety Corridor included **E**ngineering elements, **E**ducation efforts, and increased **E**nforcement.

Shaun Walker/ The Times-Standard

A California Highway Patrol officer examines the interior of a 1991 Plymouth Acclaim that was involved in an accident that killed three people on U.S. Highway 101 at the Indianola

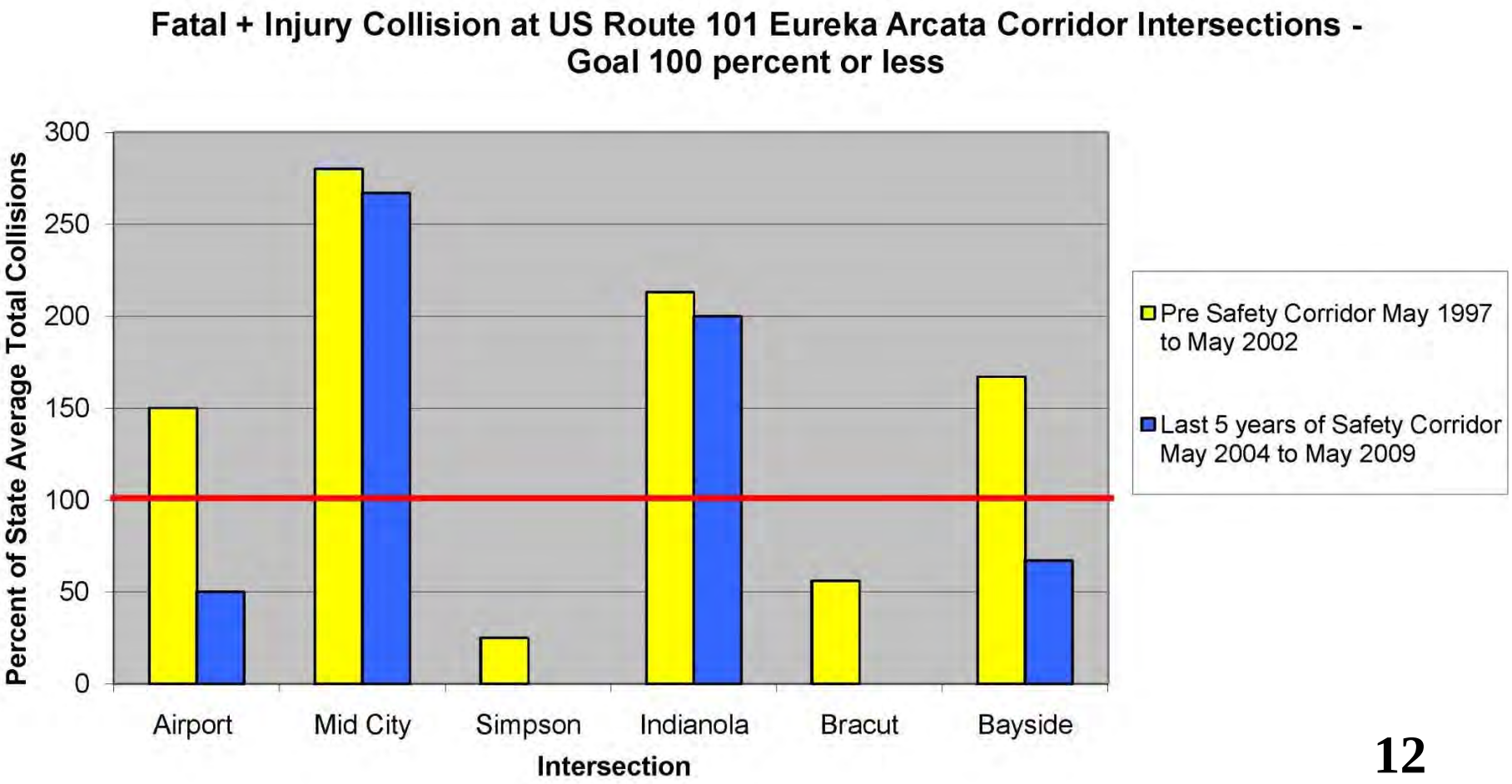
Eureka to Arcata
Route 101 Improvement Project

Collision Frequency



Eureka to Arcata
Route 101 Improvement Project

Collision Severity



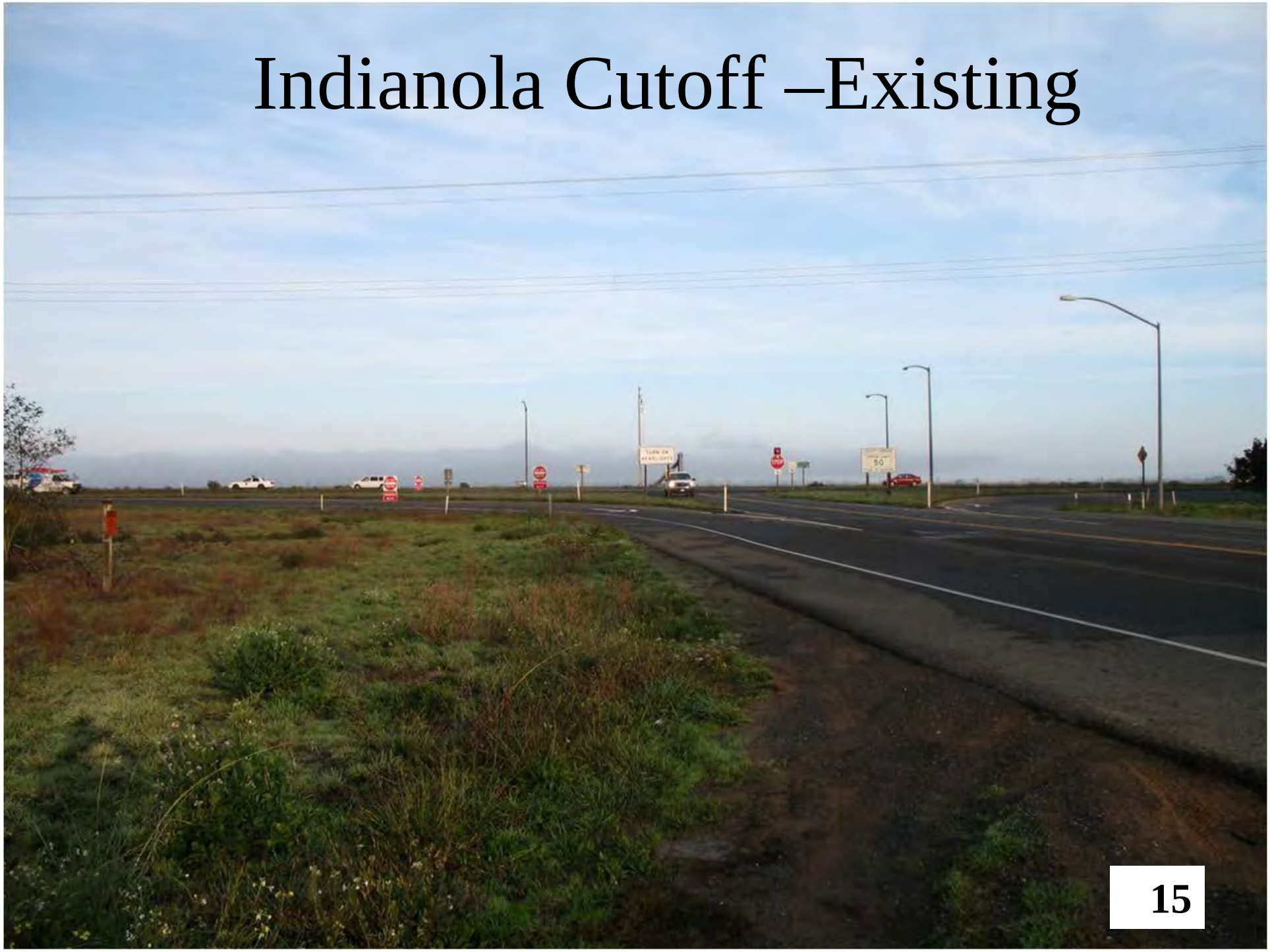
LEDPA – Least Environmentally Damaging Practicable Alternative

(concurrence from USFWS, EPA, US ACOE)

- Construct grade separation at Indianola Cutoff
- Construct half signal at Airport Road
- Close all remaining median openings
- Construct rehabilitation improvements

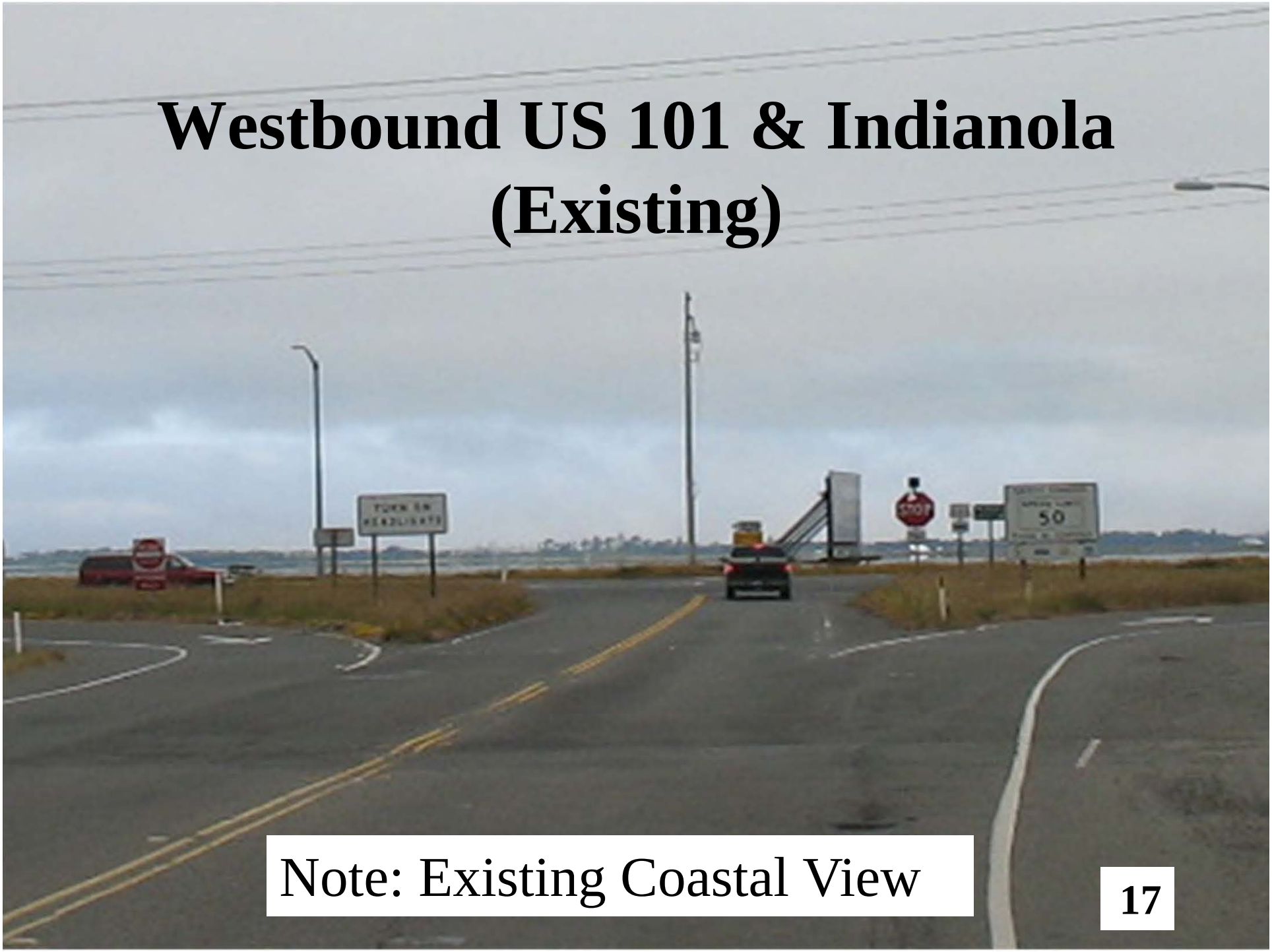
Northbound US 101 – Proposed half signal at US 101 and Airport Road

Indianola Cutoff –Existing



Indianola Cutoff – Proposed

Westbound US 101 & Indianola (Existing)



Note: Existing Coastal View

Westbound US 101 and Indianola (Proposed)

Indianola Existing

Indianola Proposed

Indianola Existing

Indianola Proposed

Indianola Proposed
(with future Bay trail)

Indianola Existing

Indianola Proposed

Indianola Proposed (with future Bay trail)

Proposed Indianola grade separation plays key access piece in the proposed Bay Trail plan

http://baytrailplan.org

Bay Trail
Grade Separation
Old Arcata Road

Existing Indianola Cutoff

Proposed Indianola Cutoff

Commission Staff Alternative

Signal at US 101 and Indianola with no additional lanes

- If installed today could create a northbound US 101 vehicle back up over half a mile long in the PM peak.
- Would likely cause diversion (PM peak) to other roads.
- Would be less safe than the preferred alternative
- Would not provide safe and efficient bike and pedestrian connection from proposed trail to Old Arcata Road inland.
- Would not meet the primary purpose of the project to improve operations and safety at corridor intersections.

Corridor Project Timeline

- Environmental Studies Begin - July 2001
- Safety Corridor Implemented – May 2002
- Draft EIR/EIS - June 2007
- Public Meeting – December 2008
- LEDPA (Preferred) Alternative – March 2011
- Conceptual Mitigation Plan Concurrence – July 2011
- Coastal Consistency Determination September 2013
- Finalize EIR/EIS 2014

Consistency Timeline

- Initial Consistency request submittal: November 2011
- Consistency scheduled for May 2012 Commission meeting
- Caltrans withdraws consistency request: April 2012
- Caltrans provided additional information in response to draft Commission staff report: July 2012
- Caltrans and Commission staff meeting – November 2012
- Resubmitted consistency request: February 2013
- Agreement signed to Stay Consistency Certification Review Period (extends 6 month review period): July 2013

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Th 12a

Correspondence

CC-016-13, Caltrans
Eureka Arcata Route 101 Corridor Improvement Project

Attached are public comment letters and emails

Exhibit 29
Correspondence

Keeping Northwest California wild since 1977

August 14, 2013

Mark Delaplaine
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219
Email: mark.delaplaine@coastal.ca.gov

Transmitted via email

Re: California Coastal Commission Review Of and Upcoming Vote On Caltrans Highway 101 Eureka-Arcata Safety Corridor Project

To Mark Delaplaine and the California Coastal Commission:

Please consider these comments on behalf of the Environmental Protection Information Center (EPIC). EPIC is an Arcata, California, based public interest conservation organization, with 2,000 active members and more than 5,000 online activists. Our members live through out the state and nation, including a significant number of local members who live in Humboldt County, and in the Eureka – Arcata area specifically. Our organization is working on a day-to-day basis to provide a vehicle for our members and grassroots constituency to have access to meaningful public participation on crucial natural resource management and environmental planning issues that can impact the livelihoods and well being of our families and communities. In that vein, these comments are provided by our organization in representation of thousands of people who have a direct interest in transportation planning in our region, and who have translated support for our policy stances into political action.

It is our understanding that the California Coastal Commission will meet in Eureka from September 10-12, and that amongst the items on the agenda will be a Coastal Commission vote on the Caltrans proposal for the Highway 101 Eureka-Arcata Safety Corridor. In this letter we convey the imperative of the Coastal Commission voting NO on the current Caltrans proposal for transportation infrastructure development in this critical section of highway. This project suffers from several flaws, and better alternatives must be designed, proposed, and considered before advancing with the project. Our opposition is based upon an intimate local knowledge of this section of highway, and a study of the proposal that reveals Caltrans plans to be inadequate and lacking in a number of fundamental elements. The remainder of this letter will highlight some of those shortcomings, and what our organization believes might be done to address those inadequacies. We encourage the Coastal Commission to vote NO on the Caltrans proposal, and to remand the project to Caltrans to have the agency engage in a more integrated manner with the local community, and to come up with a plan design for the Safety Corridor that is adequate for the times in which we live, the real transportation needs of our communities, and the sensitive ecosystems that make up the environment in which the highway is located. Caltrans needs to do a better job with project design for the Highway 101 Eureka – Arcata Safety Corridor, and it is imperative

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Fax: (707) 822-7712
www.wildcalifornia.org

that the California Coastal Commission exercises their authority to protect our coast and communities, and to encourage Caltrans to work with the local populace to establish a plan that is viable and worthy of public funds.

Public Participation Must Be Prioritized

Caltrans has been enmeshed in a series of high profile environmental conflicts that have resulted in legal challenges in both state and federal court. One of the primary causes of these textbook environmental conflicts has been the lack of transparency on the part of Caltrans, and the absence of meaningful public participation. This project as proposed for the Eureka—Arcata Safety Corridor suffers from the same obstinate agency patterns of project review that led to community resistance and opposition to the Richardson Grove Improvement Project, the Highway 197/199 STAA Access Project, and the Willits Bypass Project, to name just a few local examples. It cannot be overstated that Caltrans is facing criticism across the state for failing to fully address community concerns, and for failing to adequately analyze the impacts of their projects. Our organization is confident that the California Coastal Commission is more than familiar with those dynamics. The Highway 101 Eureka-Arcata Safety Corridor Project suffers from these same problems of lack of public participation, and the current project proposal demonstrates a total disconnect from the true transportation needs and interests of the local community, which have been communicated in various manners to Caltrans. Meaningful public participation must be honored, respected, and nurtured in order that any transportation infrastructure development in the Safety Corridor be based on the needs of the community, and not on outdated and antiquated visions of transportation in a world fast changing from climate change and biodiversity loss.

The Project Must Analyze, Assess, and Plan for Sea Level Rise

An indication of how the current project proposal design is inadequate for 21st century realities along the coast of California is the failure to appropriately include considerations of sea level rise. The highway, trail, and inland areas along this section of Humboldt Bay all rely on the deteriorating railroad berm for protection from rising sea level and/or potential extreme weather events. The erosion of the railroad berm is putting Highway 101 at risk from extreme high tides and major storms. This erosion will only worsen as sea levels rise. The confluence of tidal wetlands ecosystems, climate change, and the anticipated sea level rise is endemic to this project site, yet Caltrans does not adequately address this complex of issues in the specific project design, and in their transportation planning for this area. Millions of dollars of public funding should not be spent on this project until Caltrans completes its sea level rise study for this section of highway. Our understanding is that the agency has communicated to the public that this study will be ready in 2014. At a minimum this project should be halted until the sea level study is completed, the information shared with the public, and the findings integrated appropriately into project design and planning for transportation development in this area. The Coastal Commission should include the rapid and thorough completion of the sea level rise study in its recommendations to Caltrans upon voting NO on the current proposal.

Lack of Safe-Access for Bicyclists and Pedestrians a Fatal Flaw

It is incomprehensible that Caltrans would present a multi-million dollar project proposal that fully fails to include viable options for safe pedestrian and bicyclist travel along the Safety Corridor. This failure on the part of Caltrans to integrate pedestrian and bicycle transportation into their plan demonstrates the lack of vision and absence of innovation in their proposal. The section of trail from Arcata to Eureka is the regions highest priority for completing the California Coastal Trail, and this section of Highway 101 is also designated as part of the world renowned Pacific Coast Bike Route. Turning the Highway 101 Eureka-Arcata Safety Corridor into a high-speed motor speedway without providing for safe access and transit for bicycles and pedestrians is a fatal flaw, and should be sufficient on it’s own to convince the

Coastal Commission of the necessity of a NO vote on this project. Broad improvements for this section of highway must provide safe access for bike commuters, touring cyclists, and recreational cyclists, as well as pedestrians and runners. Bicyclists from Bayside and Indianola must also be guaranteed safe access to bike facilities along the Safety Corridor. There is a diverse local community movement that is advocating for the design of a Bay Trail that will meet many of these goals, and the Caltrans proposal for the Highway 101 Eureka-Arcata Safety Corridor must integrate this vision into the project design in order that their proposal be congruent with the true needs and desires of the local community for sustainable and safe transportation options along the bay.

Conclusion—Better Alternatives Are Needed

After review of the project proposal it has become clear to our organization that Caltrans has simply failed to consider and include many of the reasonable alternatives put forth by individuals in the local community, by sustainable transportation planning advocates, and a number of public interest organizations. As previously stated, this failure on the part of Caltrans to integrate the vision and talent of the local community into this project plan suggests that Caltrans is on the verge of repeating a now familiar pattern that has resulted in social conflict and the wasting of literally millions of dollars of public funds in the development of project proposals that the courts are finding to be inadequate in meeting legal obligations for environmental review. It is the opinion of our organization that Caltrans must provide well-developed alternatives for the Safety Corridor Project. It is possible to design a viable project that increases safety and improves transit while not depending on the construction of a massive interchange, and that include holistic approaches to transportation and environmental planning that meets the challenges of climate change, sea level rise, and new housing development. We believe that the California Coastal Commission has an important opportunity to guide Caltrans towards the creation of a truly viable and responsive project, and that a NO vote by the Commission during the Sept 10-12 meeting in Eureka is an important part of providing Caltrans the guidance and supervision that the agency needs.

Thank you very much for the consideration of our letter, and we look forward to a lively debate and exchange during the California Coastal Commission meeting scheduled for September in Eureka, California.

Attentively,

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Executive Director
EPIC – the Environmental Protection Information Center
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Arcata, CA 95521
Office Telephone: 707-822-7711
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Ralph Faust
Consulting Attorney
P. O. Box 135
Bayside, CA 95524
707-825-9347
ralph.faust@gmail.com

August 16, 2013

Mary Shallenberger, Chair
California Coastal Commission
45 Fremont Street, Suite2000
San Francisco, CA 94105

Re: Consistency Certification # CC-016-13 (Caltrans)

Dear Chair Shallenberger and Coastal Commissioners:

I write to you today in support of the Coastal Commission staff recommendation in its report of June 27, 2013 to deny the proposed Caltrans project for the Highway 101 Corridor between Eureka and Arcata in Humboldt County. The proposed project would fill more than 10 acres of wetlands, would block access to and along the coast, would create an elevated concrete structure that mars views to and along the coast, and would facilitate growth in an area where growth has not been permitted by the Commission. For these reasons, staff is correct in asserting that the proposed project is inconsistent with Coastal Act policies contained in Public Resources Code sections 30233, 30251, 30254 and 30210. Nor does the proposed project further any Coastal Act policies in a manner that would allow the Commission to approve it using the Coastal Act's conflict resolution mechanism. This project cannot be approved consistent with the Act.

However, there is one additional reason to send Caltrans back to its drawing board to rethink the project: it fails at the fundamental planning level. Caltrans has intentionally chosen to ignore the impact of sea-level rise and storm inundation upon this segment of roadway. In

its rush to convert a divided highway into a limited access freeway Caltrans has chosen not to consider the particular problems inherent in the unique geographic situation of Highway 101, namely that it is routed on what once was the floor of Humboldt Bay.

When the miners and sawyers first came to Humboldt Bay in the mid-19th century, the edge of the Bay was one-half mile or more inland of the present location of Highway 101. The early trail from Eureka to Arcata followed a path used by the Yuroks, roughly along what is now a County road variously called Old Arcata Road and Myrtle Avenue. The route now followed by Highway 101 was underneath the water of the bay. Early settlers seeking grazing lands diked off the bay, and the grazing lands that Commissioners now can see inland of Highway 101 are the result of this activity. This is how the "farmed wetlands" all around the Bay and in the Eel River bottomlands came to be. In the area of this project, the principal "restraint" of the Bay (the "shoreline protective device") is the railroad embankment for the old Northwestern Pacific Railroad, which runs just to the bayside of Highway 101 for most of the length of this project.

Attached are several graphics and photographs that illustrate the difficulty of this location. Attachment #1 (HumGIS FEMAFloodZones Map) is the FEMA 100 year flood zone map for Central Humboldt published by the Humboldt County Community Development Department. In the upper left in blue is Arcata Bay and the flood zone around it. The line that begins in Eureka, goes roughly east until it crosses Eureka Slough near Freshwater, then more or less north along the edge of the blue area, crossing Jacoby Creek, until it reaches Arcata is Myrtle Avenue/Old Arcata Road. This is the traditional path from Eureka to Arcata that, until the bay dikes were constructed by the 19th century settlers, more or less described the eastern shore of the bay. The red line that begins in Eureka and goes, while completely in the blue flood zone, northeast and then north to Arcata is Highway 101. Already Highway 101 is closed occasionally due to storm inundation. This graphic shows clearly the extent that rising seawater with storm inundation will tend to overcome the present highway location.

How close is this inundation to occurring now? Also attached are several photos taken in December 2012 along Highway 101. Attachment #2, taken at Jacoby Creek, shows how close the tide comes to the top of the railroad embankment and the highway level at high tide today. Note that it is a calm and clear, not a stormy day; it is storms that raise and drive the waters of the bay landward until they meet resistance. Attachments #3 and #4 along the railroad at two locations at Bracut show the continuing deterioration of the railroad embankment since maintenance was discontinued; it is clearly in the process of failing, with both ties and rails unsupported. The deterioration of the rail embankment is critical because it is the actual shoreline protective device for most of the route of Highway 101 in this area. Finally Attachment #5 is a graphic (Northern Humboldt Bay Shoreline Protective Structure Inventory) from a local study of sea level rise along Humboldt Bay that shows the existing shoreline protective devices, the actual structures that protect Highway 101 from tidal inundation. Looking at the protective structures along the east side of the Bay, it is clear that with the exception of two old industrial sites protected by dikes (in yellow), all shoreline protection is provided by the railroad embankment (in red).

If the railroad were fully operational, and the embankment properly maintained for train use, Caltrans might reasonably conclude that it could rely upon this protection of Highway 101 for the projected life of this project. But the railroad has not operated for more than twenty years, and the embankment, as the photos show, is steadily deteriorating as it suffers from storm wave attack. There are a few local railroad "buffs" that think that the railroad will operate again. Most of the community thinks that the best use of this right of way would be for a bicycle/pedestrian path, but there are legal and financial constraints that may take years to overcome. In particular no one has yet identified the potential cost or a source of funds to design, build and maintain this trail; and the trail, it must again be emphasized, if it is built on the rail embankment, will also function as the shoreline protective device for this area.

The simple point with respect to this project is that Caltrans cannot reasonably rely upon anyone else (either the railroad or the trail

advocates) to protect Highway 101 from storm inundation and wave attack for the life of this project. What we know will occur with respect to sea level rise over the projected life of this project only exacerbates the problem. It is not as if Caltrans is unaware of this; they just operate with a divided mind. One part of the Caltrans bureaucracy has undertaken a study of sea-level rise adaptation on three target areas of the North Coast, including this particular segment of Highway 101, to be completed in 2014. Another part of the Caltrans bureaucracy builds freeways, and has presented this project to the Commission as if the ongoing sea level rise adaptation study either didn't exist or was completely irrelevant. It is neither; and the project should never precede the study. This is one of the manifestations of Caltrans' planning failure.

The Commission should reject this project not simply for the multiple reasons clearly described in its staff's report, but also because the proposed project in this vulnerable location violates Coastal Act section 30253 (2), which provides that new development shall:

> "Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs or cliffs".

Caltrans should be required to plan this project in a manner that makes clear to the Commission how it intends to address these potential impacts over the life span of the project. Perhaps they intend to rely upon the railroad embankment, and can specify how it will be fortified and maintained. Perhaps they believe that the supporters of the new trail will protect them by rebuilding and maintaining the embankment as the foundation for the new trail. Perhaps they intend to build their own shoreline protective device. Perhaps their adaptation study or Commission staff analysis will suggest that this segment of Highway 101 would be better constructed as a causeway on concrete stilts, under which the storm waters and perhaps eventually the bay waters will flow. What is clear now is that neither Caltrans nor the Commission

knows how this impact will be addressed, and absent this knowledge, the Commission cannot find consistency with section 30253 (2).

For all of these reasons I urge the Commission to object to the consistency certification filed by Caltrans for this project, and send them back to address the consistency issues identified by your staff and in this letter.

Sincerely,

[original signed by]

Ralph Faust

Attachments:

#1: HumGIS FEMA Flood Zones Map
#2: Humboldt Bay along 101 Corridor at Jacoby Creek Bridge
#3: Humboldt Bay looking north along Railroad at Bracut
#4: Humboldt Bay looking south along Railroad at Bracut
#5: Humboldt Bay Shoreline Protective Structure Inventory

McKinleyville
Willow Creek
Glendale
Arcata
Blue Lake
Korbel
Manila
Bayside
Arcata Bay
Pacific Ocean
Samoa
Indianola
Eureka
Myrtletown
Fairhaven
Cutten
Freshwater
Kneeland
Maple Creek
Elk River
Fields Landing
Hookton
Beatrice
Table Bluff
Loleta

Humboldt Bay - Railroad Bridge over Jacoby Creek, Arcata, 12-13-12By Humboldt Baykeeper
http://www.flickr.com/photos/humboldtbaykingtides/8331373771/in/pool-2129208@N20/lightbox/

Humboldt Bay - Billboard & Railroad along Hwy 101,12-12-12

http://www.flickr.com/photos/humboldtbaykingtides/8322844511/in/pool-2129208@N20/lightbox/

Humboldt Bay - Railroad along Hwy 101 near Bracut, Eureka, 12-12-12
http://www.flickr.com/photos/humboldtbaykingtides/8323904596/in/pool-humboldtbaykingtides/

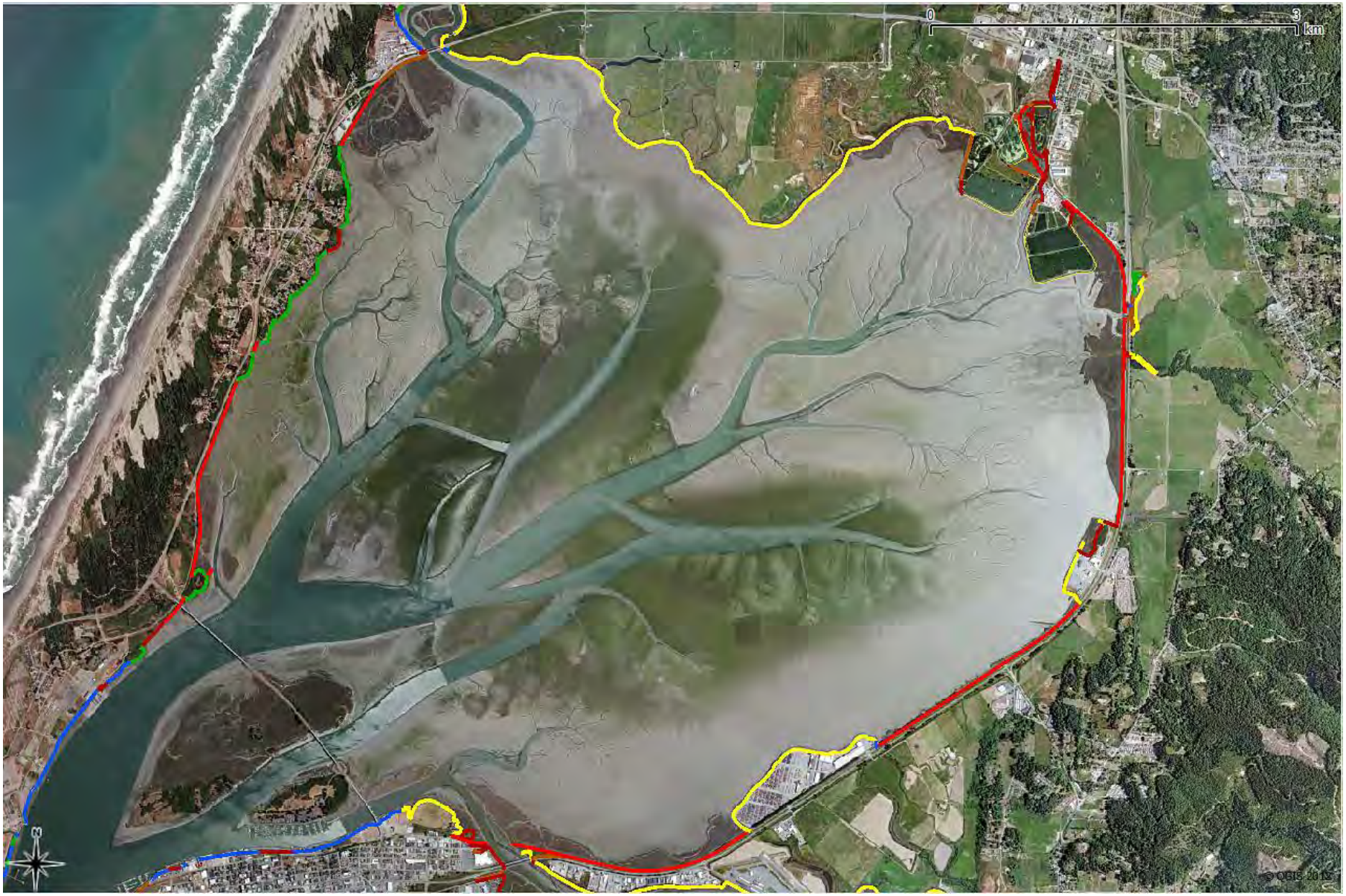

Figure 37. Distribution of shoreline structure types on Arcata Bay: dike (yellow), natural (green), railroad (red), fill (maroon), fortified (blue), and roadway (brown).

August 16, 2013

Mark Delaplaine
Manager, Energy, Ocean Resources
and Federal Consistency Division
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219
Mark.Delaplaine@coastal.ca.gov

Re: Additional Comments on the Caltrans Federal Consistency Determination for the Eureka - Arcata Route 101 Corridor Improvement Project

Dear Mr. Delaplaine,

On behalf of the board, staff and supporting members of Humboldt Baykeeper these comments are submitted regarding the proposed Federal Consistency Determination for the Eureka-Arcata Route 101 Corridor Improvement Project ("the Project"). The comments are intended to supplement our previous comments on April 22, 2012; April 11, 2013; Aug. 7, 2013 (potential wetland mitigation sites); and Aug. 14, 2013 (traffic expert review). We also submitted comments on the DEIR/S for the project on Sept. 27, 2007 and called for recirculation of the DEIR/S to address sea level rise on April 13, 2010.

Inadequate Range of Alternatives and the 2002 Route Concept Report

We continue to believe that Caltrans inappropriately narrowed the range of alternatives, in part due to their commitment to the goals listed in the 2002 Route Concept Report for Highway 101.[1] This report lists the 101 Corridor Improvements in the proposed project area (from PM 79.8/85.8) as Capacity Increasing Improvements programmed in the 2000 State Transportation Improvement Program (STIP).

Caltrans appears to be relying on this Route Concept Report to guide its decision making despite the fact that the report has not undergone CEQA review, nor has it undergone public review and comment.

[1] Route Concept Report, Route 101 from the Mendocino-Sonoma County border to the Oregon border. Caltrans District 1, Oct. 2002. http://www.dot.ca.gov/dist1/d1transplan/rcr_101.pdf

Caltrans maintains that a signalized boulevard alternative "may not be eligible for funding approval from the California Transportation Commission if it would not improve the performance of the facility and does not follow the 'approved Route Concept'" (June 27 Commission staff report, p. 24). Adherence to the Route Concept Report may explain why Caltrans has failed to fully evaluate numerous potential alternatives that have been proposed by transportation advocates, City and County staff, and the public, alternatives which might also meet Caltrans' stated goal of safety.

The preferred alternative is not the least environmentally damaging alternative. Coastal Act section 30233(a) requires that, for wetland development for one or more of the enumerated permissible use types, there must be no environmentally less damaging feasible alternative. Among the potentially less damaging project alternatives that Caltrans has failed to analyze are:

(1) Continuous Green T intersections at Indianola Cutoff, Airport Rd. and Bayside Cutoff, as recommended for further evaluation by Moule and Barber.

(2) Roundabouts, as recommended for further evaluation by Moule and Barber.

(3) Michigan lefts, as recommended by County staff and evaluated by Caltrans as Alternative 1A in the 2008 Supplemental DEIR/S but omitted from the Federal Consistency Determination. Caltrans estimated that this alternative would require just 7 acres of wetland fill (less than the Preferred Alternative).

(4) Signalization of 2-3 intersections, rather than 6 signalized intersections as analyzed in the Signalized Boulevard Concept. This alternative would reduce the amount of wetland fill required and would lessen the project impacts on adjacent roadways (SR 255 and Old Arcata Road) as compared to 6 signalized intersections, which would require 15.15 acres of wetland fill (vs. the 10.3 acres of wetland fill required for the Preferred Alternative).

(5) Maintaining the current number of lanes at signalized intersections, rather than expanding them unnecessarily to three lanes southbound and four lanes northbound in the analyzed Signalized Boulevard Concept, with extra turning lanes. This design unnecessarily increases the amount of wetland fill required for this alternative.

(6) Maintaining the 50 mph speed limit to eliminate the need for the new acceleration and decceleration lanes to accommodate the California Redwood Company.

(7) Renewing the Safety Corridor legislation enabling doubled traffic fines, as was supported by numerous commenters in the DEIR/DEIS in 2007.

Sea Level Rise Planning

As previously noted, the 101 Corridor between Eureka and Arcata is already vulnerable to flooding and storm damage, and is well within both the tsunami run-up zone and 100-year flood zone (see Appendix A).

Ongoing research conducted by Cascadia Geosciences (http://cascadiageo.org/) and the Humboldt Bay Vertical Reference Group suggests that due to tectonic activity, land subsidence on the North Spit is approximately 2.5 mm/year. The rate of subsidence is higher in the South Bay, while the coast at Crescent City is uplifting at a rate similar to current sea level rise. Studies are ongoing, but preliminary data suggest that the Humboldt Bay area could see a two-fold effect of sea level rise as the land subsides.

The cost of this project (between $25-65 million) should not be expended prior to appropriate sea level rise planning. Much public discourse has addressed the failing railroad dike, which stands between the highway and Humboldt Bay. This earthen dike was constructed nearly a century ago and was not engineered to withstand storm surge, erosion, and regular tidal action, and it is failing in numerous locations due to the lack of regular maintenance by the North Coast Rail Authority.

Plans to improve the 101 Corridor, revive the defunct railroad, and build a rail-with-trail on the railroad right of way should be planned together to withstand sea level rise while addressing fish habitat and coastal wetlands, which are in danger of drowning without the ability to migrate inland (upward) as sea level rises.

Highway 101 is a critical transportation route, and indeed for many residents is the only transportation route. During the Japanese tsunami event of 2011, it was apparent to many local residents that we are at risk due to the number of times our travel routes pass through tsunami inundation zones. The location of the highway is a quandary that has no easy solutions, but spending millions of dollars in public funds to built additional infrastructure at risk from flooding, storm damage, and increasingly higher tides is poor planning. It will also require future expenditures to further fortify public infrastructure. These public funds would be better spent developing a long-term solution that addresses physical constraints as well as the various concerns raised by the public, including safe bike/ped access, completion of this high-priority segment of Coastal Trail, visual impacts, and impacts to biological resources, as well as safety concerns for motor vehicles.

Sincerely,

_____/s/_____ _____/s/_____

Jessica Hall, Executive Director Jennifer Kalt, Policy Director

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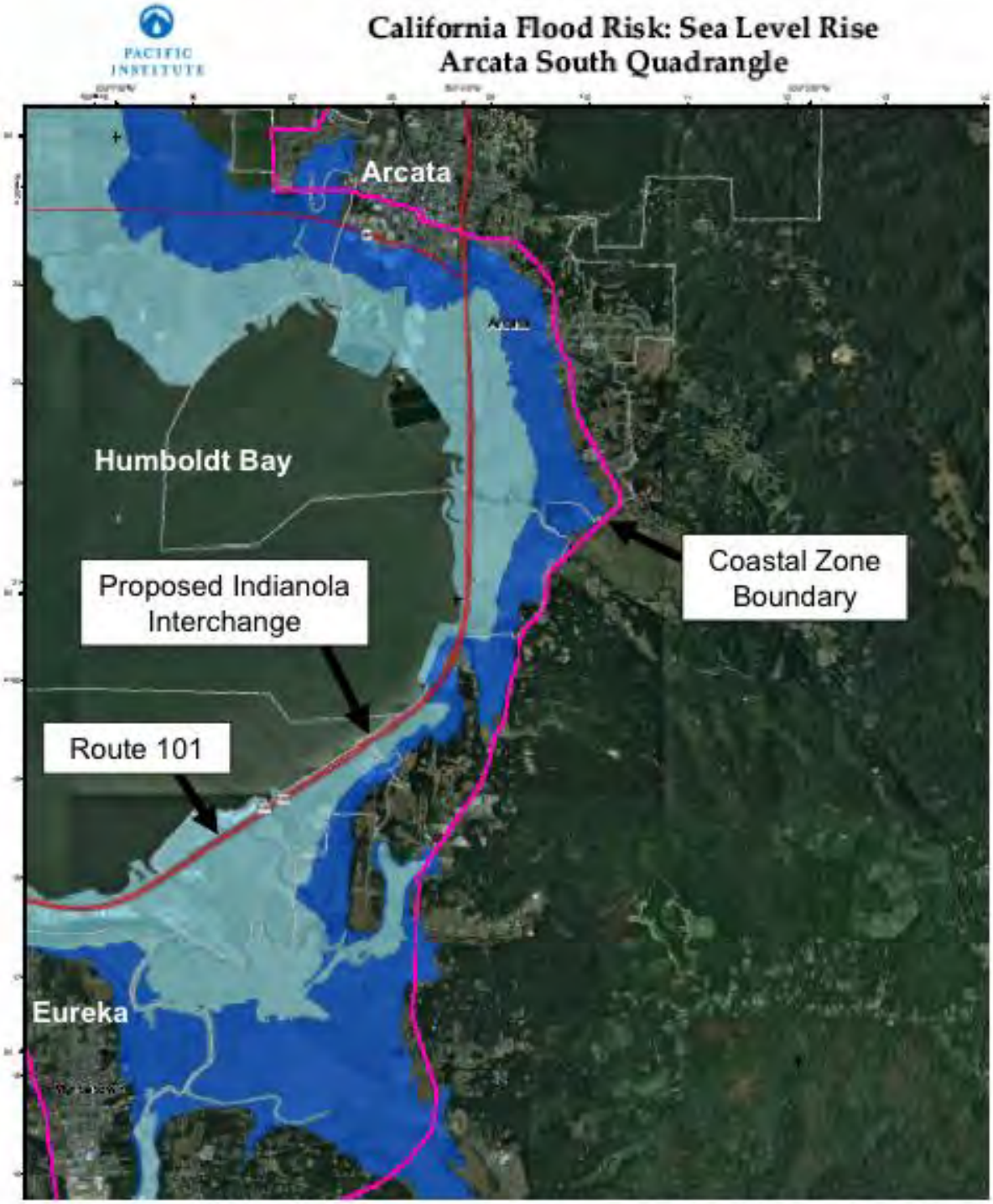
Eureka, CA 95501
(707) 268-8897
www.humboldtbaykeeper.org

Appendix A. Pacific Institute map showing approximate 100-year flood extent (light blue) and with 1.4 meters sea level rise (dark blue).



August 14, 2013

Mark Delaplaine
Manager, Energy, Ocean Resources
and Federal Consistency Division
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219
Mark.Delaplaine@coastal.ca.gov

Re: Expert Review of the Caltrans Eureka - Arcata Route 101 Corridor Improvement Project

Dear Mr. Delaplaine,

Enclosed is a review of the Caltrans Eureka - Arcata Route 101 Corridor Improvement Project conducted by Michael Moule, PE and TE, and Magnus Barber of Nelson\Nygaard Consulting Associates, Inc. Mr. Moule has over 17 years of progressive traffic and transportation engineering experience. He specializes in improving conditions for non-motorized users without degrading motor vehicle capacity and balancing the needs of all users within the public right of way.

Key points of interest for the Coastal Commission's analysis are highlighted below.

- **Increased capacity:** Caltrans states that the interchange is not capacity increasing, but according to Moule and Barber, "an interchange absolutely increases the capacity for the minor streets." [p. 5] Caltrans' assertion that construction of an intersection does not increase capacity of a highway segment "could arguably be true for through movements, but absolutely not for turning movements. The capacity of the proposed interchange is undoubtedly higher than the capacity of the existing stop-controlled intersection. This is evidenced by the LOS F ratings shown for left turning movements in the traffic studies for the project." [p. 6]
- **Increased speed:** Caltrans' statement that "the geometric changes will not cause an increase in vehicle speeds is likely inaccurate… CVC and CA-MUTCD standards require speed limits to be set in response to higher measured speeds on the corridor, which is the likely result of reducing friction through the project's proposed improvements… This is evidenced by the LOS F

ratings shown for left turning movements in the traffic studies for the project." [p. 6]

- **Signalized Boulevard Alternative: "**Many of the minor streets or driveways where signals are proposed have traffic volumes well below the thresholds typically necessary to meet the signal warrants in the California Manual on Uniform Traffic Control Devices (CA- MUTCD). It is highly unlikely that Caltrans would install a series of unwarranted signals…It is recommended that Caltrans consider a signalized boulevard concept with two to four signalized intersections." p. 9]
- **Number of Travel Lanes:** "As described in the traffic analysis section at the end of this document, our analysis indicates that two northbound lanes and two southbound lanes would be sufficient." [p. 10]
- **Wetland Encroachment:** "Based on our analysis, the existing traffic can be handled with two through lanes northbound, two through lanes southbound, one southbound left turn lane, one northbound right turn lane, two westbound approach lanes (one for right turns and one for left turns, and one eastbound departure lane. This is a total of 13 approach and departure lanes at the intersection, compared to the total of 23 approach and departure lanes shown in the drawing from Caltrans. This is a significant reduction in the highway's footprint." [p. 11]
- **Other alternatives:** In addition to a Signalized Boulevard with 2-4 signals, the consultants recommend that Caltrans fully evaluate other alternatives, including Continuous Green T intersections [p. 14] and roundabouts [p. 17]. A roundabout would provide the lowest overall delays, with an LOS A at Indianola Cutoff using peak P.M. traffic data. [p. 21]

We believe that this expert review supports our view that Caltrans inappropriately narrowed the range of feasible alternatives to meet project objectives. We support the experts' recommendation that Caltrans fully evaluate access, additional alternatives, and their impacts to bicycle/pedestrian access. Furthermore, Caltrans did not fully evaluate alternatives proposed by local municipalities and transportation advocates.

Humboldt Baykeeper hopes that this expert review will be useful in the Coastal Commission's analysis of the proposed project's Federal Consistency Determination.

Sincerely,

_____/s/_____ _____/s/_____
Jessica Hall, Executive Director Jen Kalt, Policy Director

217 E Street
Eureka, CA 95501
(707) 268-8897
www.humboldtbaykeeper.org

April 11, 2013

via email and U.S. Mail

Mark Delaplaine
Manager, Energy, Ocean Resources
and Federal Consistency Division
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219
Mark.Delaplaine@coastal.ca.gov

Re: Comments on the Federal Consistency Determination for the Eureka - Arcata Route 101 Corridor Improvement Project as Re-Submitted in February 2013

Dear Mr. Delaplaine,

On behalf of the board, staff and supporting members of Humboldt Baykeeper these comments are submitted regarding the Federal Consistency Determination for the proposed Eureka-Arcata Route 101 Corridor Improvement Project ("the Project"). Humboldt Baykeeper appreciates the opportunity to present you with our concerns regarding this Project. These comments on the February 2013 re-submittal reflect additional concerns and are intended to be supplemental to our comments submitted on April 22, 2012.

Humboldt Baykeeper respectfully requests that the Coastal Commission find the Eureka - Arcata Route 101 Corridor Improvement Project submitted by Caltrans is inconsistent with the California Coastal Act, as explained in detail below, and Deny the Federal Consistency Determination.

Inadequate Alternatives Analysis

The Signalized Boulevard Plan Alternative does not appear to be a fully-studied, practicable alternative. Creating six intersections is not necessary given current conditions, and Caltrans should have addressed how just having signals at Airport Rd. and Indianola Cutoff would affect traffic. The analysis of six signalized intersections rather than two serves to artificially increase the amount of wetland fill that would be necessary for the Signalized Boulevard Alternative, giving the false impression that the

Preferred Alternative is the Least Environmentally Damaging Practicable Alternative, although it may not be.

Deferred Mitigation for Impacts to Coastal Wetlands (Section 30230)
A change was made to the document since it was submitted in 2012 which amounts to deferred mitigation to coastal wetlands:

> Caltrans now proposes utilizing a coastal wetland restoration project as mitigation (same locations as in the CMP). The restoration project will be a separate project and will be proposed for mitigation not only for this project but for other projects within the area (including potentially for future work in external efforts to complete the Coastal trail.) The restoration project will be submitted to the Coastal Commission at a later date requesting approval as a separate project and is only described conceptually for this project's consistency review (page 69).

We have concerns about the creation of a conceptual mitigation plan. Our first concern is that it is proposed as a separate project with protection measures that have yet to be disclosed, designed, or budgeted. This does not allow the public, agencies, or the Coastal Commission to evaluate the mitigation measures' effectiveness. Second, reliance on a conceptual mitigation plan amounts to impermissible deferred mitigation. Third, mitigation measures must be fully enforceable, yet because they are not identified and included here, cannot be enforced. The costs of mitigation must be included up front in the overall cost of the project.

Impacts to Water Quality
The proposal to extending deceleration and acceleration lanes would require placement of 40,000 cubic yards of fill into coastal wetlands that currently serve as a biofilter for polluted runoff from the roadway.

According to the application, "None of the project alternatives would increase traffic carrying capacity; consequently, no increase to traffic-related pollutant runoff is anticipated from this project." (page 37). But on page 38, it states that "The increase in impervious areas typically causes an increase in the peak flow and runoff volumes… The existing vegetated slopes that provide biofiltration treatment of storm water runoff will be perpetuated."

Bicycle Safety Concerns
The partial signalization at Airport Road doesn't address bicycle safety at all. For example, southbound bicyclists wanting to turn left onto Airport Rd. would have to cross two lanes of oncoming traffic just to get over to the median. In Alternatives 1 and 2, anyone, bicyclist or motorist, wishing to turn westbound (left) from Airport Rd. onto southbound Route 101 will be required to travel north one mile to a turnaround to then go south. This wastes fuel for motorists, and it significantly inconveniences bicyclists. The full signal proposed in Alternative 3 provides more efficient mobility for all users, but as it is tied to an interchange and other undesirable alterations, should be explored in isolation as described above.

Additionally, closing medians reduces bicycle access from the Bayside Cutoff, and will force bicyclists to either travel north several miles to Arcata to access Highway 101, or to share Old Arcata Road, which has narrower shoulders, hills, poor paving and posted speeds up to 45 mph, with motorists accessing the Indianola interchange. This does not increase safety or accessibility.

The claim that it will benefit all travel modes (page 69) is unsubstantiated. We believe that Caltrans should provide data comparing the number of bicyclists and bicyclist-involved accidents using Highway 101 between Eureka and Arcata, and between Arcata and McKinleyville, which is a freeway with design conditions much like what is proposed here. We believe that the freeway conditions between Arcata and McKinleyville may actually be a deterrent to use and that this can make accident statistics appear lower, creating a false impression that the proposed alterations are safer.

Caltrans must fully address the needs of multi-modal users along this reach of Highway 101. As part of the Pacific Coast Bike Route, the bikeway along Highway 101 is an important resource for coastal access.

KOA Campground

Closure of the median at the KOA Campground will adversely affect bicyclists touring the Pacific Coast Bike Route, since it is the only campground in the area that accommodates tent camping. The KOA Campground is also identified as an EJ community (as defined in Executive Order 12898) whose residents would be adversely affected by the need for out-of-direction travel.

Growth-Inducing Impacts

An interchange at Indianola Cutoff and Route 101 would increase capacity of that intersection, and of Indianola Cutoff and would therefore also have the potential to be growth-inducing. Additionally, although we understand that the basic design maintains an "uncontrolled" highway and therefore does not explicitly increase capacity, we believe that the proposal will result in increased speeds which would in theory accommodate more users. The extension of acceleration and deceleration lanes also seem to be needed primarily to accommodate faster-moving traffic. The shortest acceleration lane currently appears to be at Bayside Cutoff, which was not observed to have accidents above state averages.

Night Lighting

Addition or extension of acceleration and deceleration lanes is noted to come with additional or upgraded lighting. We are concerned about the potential impacts of night lighting on wildlife, which has only recently been recognized to interfere with migration, hormonal production, and reproductive behavior in organisms. While any additional lighting should be appropriately shielded consistent with the principles of the International Dark-Sky Association and to prevent impacts to wildlife, we once again question the need for these additions where accident levels are not above state averages.

Sea Level Rise (SLR)
Although the 2013 re-submittal contains changes to the analysis of sea level rise impacts, however, Caltrans fails to address such impacts in any meaningful way, despite the fact that in 2009, the California Department of Fish and Game commented on the project and impacts related to sea level rise and climate change (attached). Recently, Caltrans applied for and received funding for a "Climate Change Adaptation Pilot Strategy for Critically Vulnerable Assets in Northwest California" to analyze four prototype locations, including "a corridor that includes US 101, the Northwestern Pacific Railroad, the Pacific Coast Bike Route, the California Coastal Trail and is adjacent to Humboldt Bay. Previous Vulnerability Assessments have shown this location to be critically vulnerable to SLR."

Caltrans acknowledges that the project area is critically vulnerable to sea level rise, and yet dismisses the need to address and mitigate potential impacts from sea level rise because they are not fully studied (Appendix D).

Conclusion

Humboldt Baykeeper would like to thank the California Coastal Commission and its staff for the opportunity to provide the above comments. We strongly urge you to find the Eureka - Arcata Route 101 Corridor Improvement Project as submitted by Caltrans inconsistent with the California Coastal Act, and Deny the Federal Consistency Determination.

Sincerely,

_____/s/_____ _____/s/_____
Jessica Hall, Executive Director Jennifer Kalt, Policy Director

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Eureka, CA 95501
(707) 268-8897
www.humboldtbaykeeper.org

Ms. Ali O. Lee
322 Rocky Creek Road
Bayside, CA 95524
Rockygulch95524@gmail.com

August 16, 2013

Mr. Mark Delaplaine
Energy, Ocean Resources & Federal Consistency Manager
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219
Mark.delaplaine@coastal.ca.gov

Re: **Deny the HCAOG & CalTrans Proposal for the Highway 101 "Safety Corridor" between Eureka and Arcata**

Dear Mr. Delaplaine and the Honorable Commission:

Thank you for working "to protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean" (CCC Mission Statement); I write you to further protect Humboldt Bay from undue human impact in the form of a premature traffic safety plan. Please consider denying the current proposal submitted by the Humboldt County Association of Governments (HCAOG) and CalTrans for the Highway 101 Safety Corridor. The proposed interchange at the Indianola Cut-off is an urban solution for a rural corridor with estuarine habitat not only on either side of the highway, but also in the middle of the highway dividing the northbound and southbound lanes.

HABITAT REDUCTION

Herons and egrets are common along this primary corridor circumnavigating part of Humboldt Bay—between the City of Arcata and the City of Eureka. Common, too, are traffic accidents, higher than the state average, at the Indianola Cut-off which HCAOG and CalTrans argue as the primary reason for the proposal for "improvements" to the Safety Corridor on Highway 101. While an interchange at the Indianola Cut-off may improve traffic flow and Level of Service rates for motorized vehicles, an interchange does not improve salt marsh habitat, does not increase access to the coast, diverts traffic to habitat sensitive, secondary roads, and does not improve safety regarding water inundation events. In fact, the HCAOG and CalTrans proposal reduces habitat, limits coastal access, and does not address sea-level rise and flooding from natural disasters.

According to January 2013 report on Sea-Level Rise by Aldaron Laird, commissioned by the State Coastal Conservation: "The salt marsh habitat present today is less than 900 acres…significantly less than the nearly 9,000 acres mapped

in 1870 (USCGS); large areas of salt marsh dissected by tidal tributary channels which were once common around the Bay and in the Sloughs, are now rare" (Humboldt Bay Shoreline Inventory, Mapping and Sea Level Rise Vulnerability Assessment, p.100). Please review the attached Salt Marsh Distribution Map (Laird, Figure 33).

DIVERTED TRAFFIC

Two secondary corridors complete the circumnavigation of the bay and are frequently used to travel between Arcata and Eureka: Highway 255 (west of Highway 101) through Manila and Old Arcata Road (east of Highway 101) through the eastern Arcata and unincorporated Bayside which lies in the Jacoby Creek drainage. Near the Indianola Cut-off, Old Arcata Road, traffic travels through outer Eureka when the road changes to Myrtle Avenue, in the Freshwater drainage. What happens to one corridor, impacts the other two. For example, when traffic accidents close Highway 101, then vehicles are diverted onto these secondary roads not designed for highway traffic. During Highway 101 repairs and projects, diverted traffic uses these secondary roads under which openly flow, year-round, salmon-bearing creeks as in the case of Rocky Creek next to which I live and Jacoby Creek, further up the road. Adjacent to Old Arcata Road is a nesting pair of eagles. What happens to these roads happen to these creeks and riparian zones. The HCAOG and CalTrans proposal provides no consideration for diverted traffic, other than to use traffic diversion as an argument against signalized traffic solutions in lieu of the interchange they propose. The proposal also argues for closure of median crossings and the Bayside Cut-off, which will divert traffic onto the secondary roads since access to Highway 101 will be terminated, save for access from Arcata, Eureka, and the Indianola Cut-off.

NO ACCESS TO THE COAST

When there is a bay trail, then according to the proposal, adjacent communities on Old Arcata Road and Myrtle Avenue will not have access to the trail, the corridor, or the coast if median crossings and the Bayside Cut-off are closed. The only access point will be the Indianola Cut-off. Presently, making a left from the cut-off to head south, to Eureka, is extremely hazardous for even experienced bicyclists. The proposal with the raised interchange offers a safe route for bicyclists who enter the highway on-ramp heading north, but southbound bicyclists must negotiate vehicles both leaving and entering the highway—a task difficult for experienced cyclists since motor vehicle drivers tend to roll through stop signs at freeway exits and tend to favor looking left under such conditions and a task dangerous for less experienced cyclists, including child cyclists who may be staying at the KOA Campground, marketed as a bicycle campground, adjacent to the Indianola Cut-off. The proposal does not include safe access to the future bay trail or coastal pedestrian access at the Indianola Cut-off.

NO CLIMATE CHANGE PLAN

What is more, the proposed interchange at the Indianola Cut-off is an estimated $45 to $60 million solution for a section of Highway 101 that HCAOG has deemed a vulnerable

asset and for which they have issued a call for proposal for a "Climate Change Adaptation Pilot Strategy for Critically Vulnerable Assets in Northwest California." The study's findings are tentatively due-out July 31, 2014 (HCAOG Climate Change Adaptation Project, p. 13). Denying the present HCAOG and CalTrans project would allow time for these agencies to study the results of their other project before investing in a solution not fully informed about "reduc[ing] the impacts of climate change and severe weather on state owned transportation facilities…with transportation assets that are critically vulnerable to the impacts of climate change" (HCAOG Request for Proposals for the Climate Change Adaptation Pilot Strategy for Critically Vulnerable Assets in Northwest California project, page 1).

The Highway 101 Safety Corridor was named by HCAOG as one of the four vulnerable, critical assets, by the Federal Emergency Management Authority as a flood zone, and by Humboldt County as being in the Tsunami Evacuation Zone (*gis.co.humboldt.ca.us/*). Please review the attached FEMA floodzone and Humboldt GIS maps.

Recent photographs from Humboldt Baykeeper's King Tide Initiative, show high water inundation along the Highway 101 Safety Corridor (*www.flickr.com/groups/humboldtbaykingtides/*). Given sea-level rise predictions, the safety corridor will soon be breached multiple times a year by king tides, let alone natural disasters involving flooding. Once again, here is an excerpt from Laird's Sea Level Rise report:

> During the last 100 years, sea level along California's coast has increased an average of 7 inches (2009 California Climate Adaptation Strategy). However, according to the North Spit station records, sea level is rising in Humboldt Bay at a rate of 18.6 inches per century, which is the highest rate in California; Humboldt Bay is subsiding (Russell 2012). The combination of EHT during strong El Nino events or during periods of heavy precipitation can lead to short-term increases in sea level; such as occurred on Humboldt Bay in 2003 and again in 2005/6. A conservative estimation of sea level rise for the coast of California is: 6 inches by 2030, 12 inches by 2050, and 36 inches by 2100. The CCC requires applicants for development permits to evaluate the potential affect of sea level rise on their proposed project, at a minimum of 3 feet and maximum of 6 feet of sea level rise. Relative sea level rise on Humboldt Bay will likely be greater if tectonic subsidence continues to occur (p. 109).

LESS THAN ADEQUATE MITIGATION

As a Bayside resident, bicyclist, and bus rider who commutes between Eureka and Arcata—sometimes with children—I support a safe, multi-modal transportation solution for this rural area's main corridor, but I do not support this HCAOG and CalTrans project since a guardrail with a bike lane is a minimum mitigation for the proposed interchange and closures of cut-offs and medians do not afford safe community access from communities directly east of Highway 101. A guardrail with a bike lane, adjacent to 50

mph traffic when the Safety Corridor is in place, may be a sufficient solution for experienced cyclists who want a direct route between Arcata and Eureka, but not for cyclists currently entering the highway at access points between the two cities and certainly not for less experienced cyclists who, when they get too close to the guardrail or swerve to miss an obstacle in their path, might loose their balance and tip over the guardrail into traffic while bicycling. The guardrail solution is not an adequate for children who might get off their bikes or trikes and climb over the guardrail into traffic.

The proposed guardrail separation is not safe enough for non-motorized, particularly when the speed limit returns to 65 mph when the Safety Corridor designation expires. Objects flying off motorized vehicles traveling at 50 mph or 65 mph do not obey guardrails and are dangerous for all, but most of all for non-motorized travelers. The shoulders along Highway 101 routinely have objects that bicyclists (and pedestrians who walk from Jacobs Avenue to Eureka) must negotiate; I have recently cycled around objects that have come off vehicles: firewood, a mattress, a picnic cooler, a tire, lumber, a cat carrier (sans cat) and a rearview mirror.

As a disability provider working under a federal grant to serve Older Adults Who Are Blind & Visually Impaired, I do not support this project since the plan does not address coastal access solutions or traffic safety solutions for people with disabilities, especially those who travel on the highway shoulder in both motorized and manual wheelchairs. Their needs are quite different than bicyclists'. Even though the highway is not designed for such travelers, they use Highway 101—particularly along the eastern, north-bound traffic shoulder to travel between Jacobs Avenue to Eureka.

As a Bayside Area Old Arcata Road Transportation Safety Committee Member, I do not support this project since the plan diverts traffic onto secondary corridors not designed for highway traffic and blocks access to the coast.

Thank you for denying this urban solution for rural Humboldt, where the population increased only by 0.2%, from 2010 to 2012, compared to the rest of California whose population increased by 2.1% (United States Census Bureau, Quick Facts for Humboldt County). Please deny this project being rushed by HCAOG and CalTrans before they study the results of their Climate Change Adaptation Pilot Strategy for Critically Vulnerable Assets in Northwest California—due out in 2014. This project does not serve CCC's mission "to protect, conserve, restore or enhance" Humboldt Bay. This project only serves to increase traffic flow for motorized vehicles and will encourage community and road development east of Highway 101, between Eureka and Arcata, which add to negative, cumulative impacts on coastal resources, both human and environmental.

Sincerely,

Ali O. Lee

Bayside Resident
Bayside Area Old Arcata Road Safety Initiative Member

McKinleyville
Willow Creek
Glendale
Arcata
Blue Lake
Korbel
Manila
Bayside
Samoa
Pacific Ocean
Indianola
Eureka
Myrtletown
Fairhaven
Cutten
Freshwater
Kneeland
Maple Creek
Elk River
Fields Landing
Hookton
Beatrice
Table Bluff
Loleta
Levee
200
299
255

DEL NORTE COUNTY
SISKIYOU COUNTY
SHASTA COUNTY
TRINITY COUNTY
TEHAMA COUNTY
MENDOCINO COUNTY
HUMBOLDT COUNTY
Pacific Ocean
Orick
Orleans
Weitchpec
Hoopa
Willow Creek
Trinidad
McKinleyville
Arcata
Blue Lake
Eureka
Ferndale
Fortuna
Rio Dell
Cape Mendocino
Petrolia
Weott
Alderpoint
Redway
Garberville
Shelter Cove
Blue Creek
Redwood Creek
Mad River
Trinity River
SALMON RIVER, S FK
Hayfork Creek
Van Duzen River
South Fork Trinity River
Middle Fork Eel River
North Fork Eel River
101
96
299
36

Figure 33. NOAA's Coastal Services Center's, Humboldt Bay 2009 GIS database of salt marsh habitat distribution on Humboldt Bay.

McKinleyville
Willow Creek
299
200
Glendale
Blue Lake
Korbel
Arcata
Manila
Bayside
Arcata Bay
Samoa
255
Indianola
Pacific Ocean
Eureka
Myrtletown
Fairhaven
Cutten
Freshwater
Kneeland
Maple Creek
Elk River
Fields Landing
101
Hookton
Beatrice
Table Bluff
Loleta

1734 Roberts Way, Arcata CA 95521
August 18, 2013

RECEIVED
AUG 21 2013
CALIFORNIA
COASTAL COMMISSION

California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219
Attn.: Mark Delaplaine

Re: Support for Commission Staff report objecting to CalTrans Eureka - Arcata Route 101 Corridor "Improvement" Project

Dear California Coastal Commission:

In summary, the Commission should reject CalTrans' proposal for all the reasons stated in the staff report, because it makes travel more dangerous for some motor vehicles and for all bicycles, because it ignores the benefits of a bike-pedestrian trail, and because it fails to protect the highway from rising sea level.

It appears that CalTrans' goal is to make the corridor into a freeway with 65 + mph traffic, with bicycles right next to it. There is no need for a freeway between Arcata and Eureka because the current 50mph limit is entirely satisfactory for cars, although it is currently quite dangerous for cyclists. As a cyclist I know.

Caltrans' proposal makes travel more dangerous for some cars and for other travelers such as pedestrians and cyclists. For example, CalTrans proposes to close median openings across 101, which degrades neighboring traffic flow.

CalTrans has ignored two key issues: the need to protect the highway from sea level rise and the use of NCRA right-of-way to provide a separate trail or railbanking.

CalTrans has heretofore ignored sea level rise and storm threats to the corridor. **This section of 101 is the one in California most in danger from sea level rise.** The absurdity of CalTrans' current plan for construction without protection from sea level rise is that the proposed Indianola interchange will be an island in salt water before its otherwise useful life is over.

Further, their proposal to contribute a million dollars to a ten million trail project only (maybe) after they've built their interchange is blackmail. This is CalTrans acting like a bully, and I cannot believe that such a scheme came from local CalTrans staff.

The section entitled "What about a separated trail for bicyclists and pedestrians?" in CalTrans' "Bicycle and Pedestrian Access and the Eureka-Arcata Corridor Improvement Project" fails the reasonableness test. For example, CalTrans claims that mixing bicycles and cars at freeway speeds is safe; all recent experience shows this is false, and their proposed bike lanes are more likely to be blood-red colored

than brick-red (CalTrans terminology) colored.

CalTrans should adopt a goal that would make travel safer or at least no worse for everyone, which is Caltrans' obligation in its enabling legislation. Specifically, **CalTrans should provide a trail for cyclists and pedestrians, the potential for eventual rail (perhaps railbanking), and a highway protected from sea level rise.** This plan would make wetland damage much less as well.

I believe there's plenty of room in CalTrans' right-of-way for highway, rail and trail, even without moving the highway. If I am wrong, then CalTrans can move the entire highway over, as it currently proposes (to save the trees, but why?), so that there is room for rail and a separate trail. They can do that without NCRA.

However, corridor protection must involve the NCRA property, and CalTrans should protect the highway by enhancing the NCRA prism, which is already failing. See photo attached. NCRA is bankrupt and has no plans or resources to do anything with that right-of-way. Like a dog in the manger, NCRA has denied access by opposing railbanking. They've also adopted bicycle trail "standards" that effectively prohibit trails on their property. It is clearly in the public interest to reject NCRA's denial of railbanking. This would also enable a safe coastal trail.

With NCRA bankrupt surely a deal can be cut, if all agencies pull together for a sensible plan. The key agency to make this work is the Coastal Commission.

Thank you, and I shall look forward to hearing your decision.

Sincerely,

John Schaefer

John Schaefer, Ph.D.

cc
Senator Noreen Evans
Assemblyman Wes Chesbro

Storm Damage on NCRA Threatens Highway 101 (photo 8/18/13)

RECEIVED

AUG 21 2013

CALIFORNIA
COASTAL COMMISSION

August 19, 2013

Dear Mr. Delaplaine

I am sending you this message (with signed letter to follow) to urge you to ***not approve*** the CalTrans Eureka-Arcata Route 101 Improvement Project without the addition of a multimodal trail. CalTrans has disregarded its own directive (see below and attached; DD-64-R1) and proposed a Project that will actually make cycling more dangerous than it currently is on the "Safety Corridor." To date, all that CalTrans has done for cyclists on the "Safety Corridor" is added a rumble-strip. The addition of a rumble-strip is not my idea of accommodating cyclists, it's merely an early warning system that lets you know you are about to be hit. Back in 2008, I wrote the attached letter to Ms. Floyd asking CalTrans to follow their own directive and provide this community with what it wants, a way to travel back and forth between Arcata and Eureka on a bicycle without significant risk. In 2008, I was a bike commuter, logging lots of round trips. I no longer commute on a bike because of the imminent danger. Now that we all have smart phones, we are all more distracted while driving than ever before, I trust you understand.

It's important that you know that a lot of people bicycle commute on the "Safety Corridor" daily. The "Safety Corridor" also is used by a large number of touring cyclists. We need a safe route; this Project will not provide safety or multimodal opportunities. Unfortunately, CalTrans does not seem to care about cyclists and the California Coastal Commission will have to act. Please tell CalTrans that this Project must accommodate cyclists, they need to include a trail, and they need Complete Streets!

TITLE Complete Streets - Integrating the Transportation System

POLICY

The California Department of Transportation (Department) provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the State highway system. The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system.

The Department develops integrated multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian, and transit travel is facilitated by creating "complete streets" beginning early in system planning and continuing through project delivery and maintenance and operations. Developing a network of "complete streets" requires collaboration among all Department functional units and stakeholders to establish effective partnerships.

Sincerely,

Michael van Hattem

December 12, 2008

Eureka-Arcata Route 101 Corridor Improvement Project

Dear Ms. Floyd,

I attended the open house and discussion of the two additional alternatives for the Eureka-Arcata Route 101 Corridor Improvement Project. I remain puzzled over your agencies inability to provide safe access for cyclists along the corridor. Bicyclists are the second largest user group, our numbers are increasing, and without question many more cyclists will be riding the corridor in the future. I trust that Caltrans understands that bike commuting is a desired approach to transportation in our community.

The current project alternatives do not represent *Complete Streets* as explained and mandated in Deputy Directive # DD-64-R1. Specifically, "The Department (Caltrans) views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system." Furthermore, "The Department develops integrated multimodal projects in balance with community goals, plans, and values." So I ask you- where is it, where is the integration and how is the current set of alternatives multimodal? Adding a rumble strip and supporting the development of an Arcata/Eureka trail independent of Highway 101 stacks up to literally nothing.

I think Caltrans can do better. I logged over 800 commute miles (40+ round trips) this year on my bike on the corridor. I am healthier and happier for it. The corridor is not safe for cyclists now and will be less safe with the alternatives that are proposed. Please follow your own directive and provide a safe and effective means for bicycle commuters to travel our 101 corridor. This is your chance to provide safe access to all users, not just the ones that choose to drive a car.

Sincerely,

Michael van Hattem
2033 Haeger Avenue
Arcata, CA. 95521

Deputy Directive

Number:	DD-64-R1
Refer to Director's Policy:	DP-22 Context Sensitive Solutions DP-05 Multimodal Alternatives DP-06 Caltrans Partnerships DP-23-R1 Energy Efficiency, Conservation and Climate Change
Effective Date:	October 2008
Supersedes:	DD-64 (03-26-01)

TITLE Complete Streets - Integrating the Transportation System

POLICY

The California Department of Transportation (Department) provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the State highway system. The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system.

The Department develops integrated multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian, and transit travel is facilitated by creating "complete streets" beginning early in system planning and continuing through project delivery and maintenance and operations. Developing a network of "complete streets" requires collaboration among all Department functional units and stakeholders to establish effective partnerships.

DEFINITIONS/BACKGROUND

Complete Street – A transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit riders, and motorists appropriate to the function and context of the facility.

The intent of this directive is to ensure that travelers of all ages and abilities can move safely and efficiently along and across a network of "complete streets."

State and federal laws require the Department and local agencies to promote and facilitate increased bicycling and walking. California Vehicle Code (CVC) (Sections 21200-21212), and Streets and Highways Code (Sections 890 – 894.2) identify the rights of bicyclists and pedestrians, and establish legislative intent that people of all ages using all types of mobility devices are able to travel on roads. Bicyclists, pedestrians, and nonmotorized traffic are permitted on all State facilities, unless prohibited (CVC, section 21960). Therefore, the Department and local agencies have the duty to provide for the safety and mobility needs of all who have legal access to the transportation system.

Department manuals and guidance outline statutory requirements, planning policy, and project delivery procedures to facilitate multimodal travel, which includes connectivity to public transit for bicyclists and pedestrians. In many instances, roads designed to Department standards provide basic access for bicycling and walking. This directive does not supersede existing laws. To ensure successful implementation of "complete streets," manuals, guidance, and training will be updated and developed.

RESPONSIBILITIES

Chief Deputy Director:

- Establishes policy consistent with the Department's objectives to develop a safe and efficient multimodal transportation system for all users.
- Ensures management staff is trained to provide for the needs of bicyclists, pedestrians, and transit users.

Deputy Directors, Planning and Modal Programs and Project Delivery:

- Include bicycle, pedestrian, and transit modes in statewide strategies for safety and mobility, and in system performance measures.
- Provide tools and establish processes to identify and address the needs of bicyclists, pedestrians, and transit users early and continuously throughout planning and project development activities.
- Ensure districts document decisions regarding bicycle, pedestrian, and transit modes in project initiation and scoping activities.
- Ensure Department manuals, guidance, standards, and procedures reflect this directive, and identify and explain the Department's objectives for multimodal travel.
- Ensure an Implementation Plan for this directive is developed.

Deputy Director, Maintenance and Operations:

- Provides tools and establishes processes that ensure regular maintenance and operations activities meet the safety and mobility needs of bicyclists, pedestrians, and transit users in construction and maintenance work zones, encroachment permit work, and system operations.
- Ensures Department manuals, guidance, standards, and procedures reflect this directive and identifies and explains the Department's objectives for multimodal travel.

District Directors:

- Promote partnerships with local, regional, and State agencies to plan and fund facilities for integrated multimodal travel and to meet the needs of all travelers.
- Identify bicycle and pedestrian coordinator(s) to serve as advisor(s) and external liaison(s) on issues that involve the district, local agencies, and stakeholders.
- Ensure bicycle, pedestrian, and transit needs are identified in district system planning products; addressed during project initiation; and that projects are designed, constructed, operated, and maintained using current standards.
- Ensure bicycle, pedestrian, and transit interests are appropriately represented on interdisciplinary planning and project delivery development teams.
- Provide documentation to support decisions regarding bicycle, pedestrian, and transit modes in project initiation and scoping activities.

Deputy District Directors, Planning, Design, Construction, Maintenance, and Operations:

- Ensure bicycle, pedestrian, and transit user needs are addressed and deficiencies identified during system and corridor planning, project initiation, scoping, and programming.
- Collaborate with local and regional partners to plan, develop, and maintain effective bicycle, pedestrian, and transit networks.
- Consult locally adopted bicycle, pedestrian, and transit plans to ensure that State highway system plans are compatible.
- Ensure projects are planned, designed, constructed, operated, and maintained consistent with project type and funding program to provide for the safety and mobility needs of all users with legal access to a transportation facility.
- Implement current design standards that meet the needs of bicyclists, pedestrians, and transit users in design, construction and maintenance work zones, encroachment permit work, and in system operations.
- Provide information to staff, local agencies, and stakeholders on available funding programs addressing bicycle, pedestrian, and transit travel needs.

Chiefs, Divisions of Aeronautics, Local Assistance, Mass Transportation, Rail, Transportation Planning, Transportation System Information, Research and Innovation, and Transportation Programming:

- Ensure incorporation of bicycle, pedestrian, and transit travel elements in all Department transportation plans and studies.
- Support interdisciplinary participation within and between districts in the project development process to provide for the needs of all users.
- Encourage local agencies to include bicycle, pedestrian, and transit elements in regional and local planning documents, including general plans, transportation plans, and circulation elements.
- Promote land uses that encourage bicycle, pedestrian, and transit travel.
- Advocate, partner, and collaborate with stakeholders to address the needs of bicycle, pedestrian, and transit travelers in all program areas.
- Support the development of new technology to improve safety, mobility, and access for bicyclists, pedestrians, and transit users of all ages and abilities.
- Research, develop, and implement multimodal performance measures.
- Provide information to staff, local agencies, and stakeholders on available funding programs to address the needs of bicycle, pedestrian, and transit travelers.

Chiefs, Divisions of Traffic Operations, Maintenance, Environmental Analysis, Design, Construction, and Project Management:

- Provide guidance on project design, operation, and maintenance of work zones to safely accommodate bicyclists, pedestrians, and transit users.
- Ensure the transportation system and facilities are planned, constructed, operated, and maintained consistent with project type and funding program to maximize safety and mobility for all users with legal access.
- Promote and incorporate, on an ongoing basis, guidance, procedures, and product reviews that maximize bicycle, pedestrian, and transit safety and mobility.
- Support multidisciplinary district participation in the project development process to provide for the needs of all users.

Employees:

- Follow and recommend improvements to manuals, guidance, and procedures that maximize safety and mobility for all users in all transportation products and activities.
- Promote awareness of bicycle, pedestrian, and transit needs to develop an integrated, multimodal transportation system.
- Maximize bicycle, pedestrian, and transit safety and mobility through each project's life cycle.

APPLICABILITY

All departmental employees.

Randell H. Iwasaki

RANDELL H. IWASAKI
Chief Deputy Director

October 2, 2008
Date Signed

Delaplaine, Mark@Coastal

From: Richard Ridenhour <ridenhourrl@gmail.com>
Sent: Saturday, August 24, 2013 5:34 PM
To: Delaplaine, Mark@Coastal
Subject: PROPOSED EUREKA-ARCATA HIGHWAY PROJECT

22 August 2013

Mr. Mark Delaplaine
Manager, Energy, Ocean Resources and Federal Consistency Division
California Coastal Commission
45 Fremont St., Suite 2000
San Francisco, CA 94105-2219

Dera Mr. Delaplaine:

I wish to add my objection to the plan proposed by the California Department of Transportation for changes to Highway 101 between Eureka and Arcata in Humboldt County.

First, the plan does not really consider the status of the railroad paralleling the highway for most of this section. The railroad appears to constitute a major constraint to modification of the lateral roads that access Highway 101. Until a definite decision is made with regard to the future of the railroad, major changes to the highway in this area seem premature.

Second, somewhat contrary to the evidence provided in the project prospectus, the current Safety Corridor seems to have greatly alleviated the serious, and particularly fatal, accidents in this section of the highway. Abidance to the restricted speed seems to vary substantially depending on the appearance of law enforcement efforts.

Third, a major consideration about the future of this portion of Highway should be the effect of likely sea level rises. It is entirely possible that the proposed major changes to the highway without this consideration would necessitate an even more substantive project within a fairly short time.

Fourth, the placement of stop-and-go traffic lights essentially extend the urban traffic controls of Eureka. Granted, these lights, along with the closure of the median crossings (which obviously will be opposed vigorously by affected commercial developments), are intended to resolve the lack of planning in the past but they are poor answers to the problem.

My recommendation is for no project until the railroad question is resolved and the other factors are considered.

Sincerely,

Richard L.Ridenhour
2736 Sunny Grove Ave.
McKinleyville, CA 95519
(707) 839-3300
ridenhourrl@gmail.com

Delaplaine, Mark@Coastal

Subject: FW: Caltrans Bypass in Willits and Caltrans Plan for Putting in High Speed Freeway Here.

---------- Forwarded message ----------
From: **Anne Hubbard** <sweetfennel@gmail.com>
Date: Fri, Aug 23, 2013 at 9:57 AM
Subject: Caltrans Bypass in Willits and Caltrans Plan for Putting in High Speed Freeway Here.
To: mlovelace@co.humboldt.ca.us

http://abclocal.go.com/kgo/story?section=news/assignment_7&id=9097038

Dear Supervisor Mark Lovelace, and Board of Sups:

Thank you for the letter you took the initiative to write and the subsequent communications to release water into our beautiful Trinity (and Klamath) River. I hope water will be released shortly,and in time to save this record salmon run! Enjoyed watching the commenter-fisherwoman through archives.

The Caltrans bypass in Willits is a questionable use of taxpayer money. Please view the KGO clip I have included: http://abclocal.go.com/kgo/story?section=news/assignment_7&id=9097038. See attachment for the link.

Now Caltrans has plans to make our Safety Corridor into a high-speed freeway. Its urban blight brought to you by Caltrans.

They have cut the Endeavor out of existance, now the senior centers have cut Monday lunch programs out in the last few weeks, and many of our services are being cut. You can't get a partial or dentures on medi-cal, and so many people in California are having to do with no teeth since they cut dental care out of the medi-cal program a couple of years back.

We do not need urban blight at the expense of our security in old age.

Also, Fukishima Nuclear Reactor in Japan is unstable, leaking and in danger of more meltdowns by its 5 or 6 reactors. Shouldn't the government be addressing that and getting involved in safeguarding the population and the rains, foods, tuna and salmon i.e. fish, from radiation contamination? Shouldn't money first be spent on getting involved to help contain the accident before spending money needlessly? At least geiger counters should be used on our foods, and the tuna our pets ingest. You are familiar with the veterinary costs of cancer. Everyone seems to know of someone who has grappled with it. I have read that thyroid disease in infants has risen sharply in California--30% in babies born soon after the melt-down. What next?

Please, Supervisors and especially Mark Lovelace, my supervisor in Arcata, watch the KGO clip I am attaching:

Delaplaine, Mark@Coastal

From: lawrence eitzen <eitzenlaw@gmail.com>
Sent: Wednesday, August 21, 2013 2:10 PM
To: Delaplaine, Mark@Coastal
Subject: Safety Corridor, Hghwy 101

Mark,

I live on Ole Hansen and commute by bike on a close to daily basis to downtown Eureka. My normal course of travel takes me across 101 at the Indianola Cutoff. Crossing 101 is a challenge even with the safety corridor speed. I am surprised to learn that the Dept. of Transportation has not taken the design opportunity to increase my life expectancy and that of many other commuters.

Please use your review authority to change this.

--
Larry Eitzen

Delaplaine, Mark@Coastal

From: Terry Raymer <twraymer@hotmail.com>
Sent: Wednesday, August 21, 2013 9:49 AM
To: Delaplaine, Mark@Coastal
Subject: Caltrans 101 Corridor Project

Dear Mr. Delaplaine,

I am a Humboldt County resident who uses the 101 corridor multiple times per week, but I also bike commute to work sometimes using the corridor. I have the following concerns about the corridor:

- **Please consider a Bay Trail.** Caltrans' project should provide safe access for bike commuters, touring cyclists, and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.

- **Plan for Coastal Flooding and Sea Level Rise:** Highway 101 is currently at risk of flooding during extreme high tides and major storms. The railroad berm and dikes, which are currently the only protection from high water levels, are eroding – putting the 101 corridor at even greater risk. Sea level rise will only add to these problems. Work on the highway, trail, and rail corridors should all be planned together while taking into account storms, high tides, and projected sea level rise. Caltrans needs to address these issues before any action is taken on the 101 corridor project.

- **Address Impacts to Surrounding Communities:** Closure of the Bayside median and construction of a capacity-increasing interchange is likely to result in increased traffic on Old Arcata Road. Caltrans must consider and address the impacts resulting from the project to Old Arcata Road and other routes. Caltrans should also carefully consider the many reasonable project alternatives put forth by local agencies and the public.

Thank you for the opportunity to express these concerns.

Best, Terry Raymer MD

Delaplaine, Mark@Coastal

From: N Coyne <ncoyne@gmail.com>
Sent: Tuesday, August 20, 2013 9:14 PM
To: Delaplaine, Mark@Coastal
Subject: Humboldt County Safety Corridor

I support the inclusion of non-motorized routes as part of the plan for the safety corridor. A bay trail and the continuation of the California Coastal trail should be a priority in any plan. Safety for all people and vehicles - motorized and non-motorized - should be the goal. I really enjoy the the eucalyptus trees, too.

Thank you!
Nicole Coyne

Works in Eureka.
Lives in Loleta.
Bicycles all over.

Delaplaine, Mark@Coastal

From: lostcoasting . <jzakoren@gmail.com>
Sent: Tuesday, August 20, 2013 5:10 PM
To: Delaplaine, Mark@Coastal
Subject: RE: Caltrans Project and Bay Trail

Dear Mr. Delaplaine,

As a Humboldt local, Eureka resident, and member of Humboldt State University's Environment & Community Master's Program I urge you , in the words of the Humboldt Trails Council, "no project without the Bay Trail!

Caltrans' project must ensure safe access for bike commuters, touring cyclists, and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a Class I trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project."

Sincerely yours,

Justin Zakoren

Mary Shallenberger,

Chair California Coastal Commission

45 Fremont Street, Suite2000

San Francisco, CA 94105

Re: Consistency Certification # CC-016-13 (Caltrans) aka, 101 Corridor project

I am writing to you today as home owner since 1979 in the Indianola Area between Eureka and Arcata. I have raised two children here at 7310 Myrtle Ave and they both learned to drive while living here. During that time the speed limit was 65 mph on 101, no safety corridor, no flashing lights. I never viewed it as particularly dangerous until about 12 years ago we had a series of fatal accidents at 101 and Indianola. There was a public clammier for something to be done. The Safety Corridor was established. I was skeptical at first, but as enforcement was stepped up, and people really started slowing down. There was a big change and very few accidents, Success.

Cal-trans was not satisfied they wanted to get the speed limit back to 65 so Cal-Trans concocted the 101 Corridor Improvement Project. This plan called for closing all the medians and a full interchange at Indianola Cutoff. The business on Jacobs Ave howled in protest and enviably there was a compromise. A half signal was proposed. During this period one of the median breaks to Jacobs's ave was closed. The message was clear support the project or we will close your other median.

Cal-Trans as never considered or seriously studied reasonable alternatives for this project. I would cite as an example, half signals at Indianola and Bayside. The Eureka-Arcata Route 101 Corridor Improvement Project Review by Nelson Nygaard, provided by Humboldt Baykeeper, spells this out clearly. I concur with its findings.

A signal at Indianola is dismiss as to dangerous by Cal-trans, yet one is purposed for Jacobs ave and a full signal on 101 at Kmart at the South entrance to Eureka exists and is the first stop in nearly two hours of driving. I am not aware of any fatalities there. Cal-trans didn't blink about installing that one.

The Growth inducing effects of and interchange at Indianola are clear to those of us who live here. The pressure has been on this area for many years. Wal-Mart was purposed at the Southeast corner and a strip center purposed on the Northeast corner. Several attempts at large housing development have been made or purposed. The lack of an interchange has been stated as a limiting factor in all of these. Many of us believe that with an interchange the pressure to convert the existing industrial timberlands between Freshwater and Jacoby Creek would be intense and would be inevitable.

Failure to study and planning for sea level rise and storm surge is a huge over site. It a storm event a few years ago I witness 101 be closed between Indianola and Arcata. I saw small waves breaking in the South bound lanes of 101 depositing drift wood on the highway.

It is my contention that this project is not consistent with the California Coastal Act is a waste of public resources both Highways 299 & 36 are much more dangerous and need safety improvements on them immediately.

The money saved should be used to create a pedestrian and Bike Trail along Humboldt Bay.

Thank you for your consideration,

Larry Glass

7310 Myrtle Ave

Eureka, Ca 95503

larryglass71@gmail.com

RECEIVED
AUG 19 2013
CALIFORNIA
COASTAL COMMISSION

To: the Coastal Commission:

No to Caltrans 101 Corridor Project without the Bay Trail!

We need improvements instead of closures!

Regards,

Elisabeth Hawthorne

640 No, Pebble Beach Dr.

Crescent City, Ca. 95531

and

531 Jochetta Ct.
Healdsburg, CA. 95448

RECEIVED
AUG 19 2013
CALIFORNIA
COASTAL COMMISSION

August15, 2013

Mark Delaplaine
California Coastal Commission

Dear Commissioner Delaplaine,

I'm writing to express my concerns about Caltrans' plans for the corridor between Arcata and Eureka. I am one of many local residents who feel that the current traffic-slowing (special zone 50 mph speed limit) is an acceptable safety measure for this part of Hwy 101.

I am **not** in favor of overpass construction to speed traffic due to its environmental impact on coastal wetlands, and its cost, given that the current Safety Corridor seems to be an effective solution for cross-traffic safety in this stretch.

Also, Highway 101 is currently at risk of flooding during extreme high tides and major storms. The protective railroad berm and dikes are eroding. Work on the highway, trail, and rail corridors should all be planned together while taking into account storms, high tides, and projected sea level rise. **Caltrans needs to address these issues before any action is taken on the 101 corridor project.**

Additionally, closure of the Bayside median and construction of a capacity-increasing interchange is likely to result in increased traffic on Old Arcata Road. **Caltrans must consider and address the impacts resulting from the project to Old Arcata Road and other routes.**

However, if the determination is made that Caltrans' overpass project will go ahead, **Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.** Our community has long been in need of safe bike and pedestrian passage between Eureka and Arcata. The existing (unused) rail lines are an ideal basis for such a trail. **(see http://baytrailplan.org)**

It is unacceptable for Caltrans to turn the 101 Corridor adjacent to Humboldt Bay into a high-speed freeway without safe accommodations for cyclists and pedestrians.

Thanks for your serious consideration of these issues. The current Caltrans proposal would have major long- term (negative) impacts on the on safety and quality of life in our community.

Sincerely,

Kit Davenport
30 East 11th St.
Arcata, CA 95521 davenport.kit@gmail.com

RECEIVED
AUG 19 2013
CALIFORNIA
COASTAL COMMISSION

David Callow
69 Riverview Lane
McKinleyville, Cal 95519-9263
dcallow@humboldt1.com
(707) 668-4084

August 16, 2013

California Coastal Commission
Mark Delaplaine
45 Fremont Street, Suite 2000
San Francisco, California 94105-2219

Dear Mr. Delaplaine,

I urge you to scuttle Cal Trans proposed 101 Corridor project between Arcata and Eureka. It would harm local business and residences by restricting local traffic and would not devote sufficient resources to strengthening the railroad dike which is the roadway's only defense against rising water levels. Please defeat this project.

Thanks,

D. Callow

David Callow

Delaplaine, Mark@Coastal

From: Sarah Torres <steureka89@gmail.com>
Sent: Tuesday, August 20, 2013 12:14 PM
To: Delaplaine, Mark@Coastal
Subject: Humboldt Bay Trail

My name is Sarah Torres. I have lived in Humboldt County since I was 3 years old. I'm soon to be 24... I work for the California Conservation Corp, Humboldt Bay Non Residential. I am all for the Humboldt Bay Trail. We have needed this trail for a long time. Not only would it be a tourist attraction, but locals like me would use it, especially in the summer time. Not only would it be safer for pedestrians and bicyclists, it would promote healthy, outdoor physical activity.... Thank you for listening.

Sarah Torres

Delaplaine, Mark@Coastal

From: yellowgate Road <yellowgateroad@gmail.com>
Sent: Tuesday, August 20, 2013 12:52 PM
To: Delaplaine, Mark@Coastal
Subject: Humboldt county 101 Corridor Project

Dear Mark:

I am very concerned about bicycle and pedestrian safety between Eureka and Arcata. It seems to me that we have a very high rate of pedestrian and bicycle casualties locally. We need a safe way to bicycle between Eureka and Arcata. Please include a trail option in this corridor project. Myrtle Ave/ Old Arcata Road is too dangerous, and is likely to become more so if this project goes through.

Jan

Delaplaine, Mark@Coastal

From: Marianne M. Ahokas <Marianne.Ahokas@humboldt.edu>
Sent: Tuesday, August 20, 2013 12:55 PM
To: Delaplaine, Mark@Coastal
Subject: Humboldt Bay Trail

I'm writing to register with the Coastal Commission my support for safe access for cyclists--both commuters and tourists--and pedestrians in the Eureka-Arcata Safety Corridor plan. I myself am both an avid cyclist and walker and would cycle to Eureka from my home in Arcata if I didn't feel I was taking my life in my hands on 101 by doing so. A safe route for cyclists and walkers should certainly be included!

Thank you for your time.

--
Marianne Ahokas
English Department
Humboldt State University
Arcata, CA 95521

Founders 226
707.822.8385
http://users.humboldt.edu/mahokas/

Delaplaine, Mark@Coastal

From: sealhayes@gmail.com on behalf of Dancing Sun Crystals <dancingsuncrystals@gmail.com>
Sent: Tuesday, August 20, 2013 9:55 AM
To: Delaplaine, Mark@Coastal
Subject: Caltrans highway project in Humboldt

Hello,

We need a bike trail along Humboldt Bay. Do make improvements to Hwy 101 without addressing the needs of a bike trail is an irresponsible act of negligence on the part of Caltrans. We live in a community that bikes! We need safer corridors to get more people riding rather than driving in their cars. Fewer cars on the road will benefit Caltrans and California. Also one of our greatest assets is the beauty of the area and the tourists who are attracted to it. To offer more biking trails will bring in more environmentally friendly tourist. Please help designate 101 as a safe Pacific Coast Bike Route.

Sincerely,
Charlotte Hayes

Delaplaine, Mark@Coastal

From: Kay Schaser <bkshaz@yahoo.com>
Sent: Tuesday, August 20, 2013 9:42 AM
To: Delaplaine, Mark@Coastal
Subject: Highway 101 "improvements" between Eureka and Arcata

To Whom It May Concern,

The reduced speed zone between Eureka and Arcata seems to be working, so a major interchange seems like overkill. But, should the project go forward anyway, it definitely needs to address safe accommodations for cyclists and pedestrians by incorporating the Humboldt Bay Trail, as well as addressing sea level rise and impacts on other roadways. Please don't be narrow in your thinking and carefully consider the many reasonable project alternatives put forth by local agencies and the public.

Thank you for your consideration,

Kay Schaser

Delaplaine, Mark@Coastal

From: Wilhelm Schaser <wkshaz@yahoo.com>
Sent: Tuesday, August 20, 2013 9:32 AM
To: Delaplaine, Mark@Coastal
Subject: Humboldt Trails Project

Dear Mr Delaplaine

Humboldt County is a unique part of California. Despite our drug culture the general public is becoming more aware of environmental issues and sustainable development. The Bay Trail Project is an essential component for our growth towards developing this ethos. Many of us feel strongly that Caltrans should guarantee the bike and hiking corridor before moving forward on their vision. I hope you will use your influence to further the vision we have for the future of Humboldt County.
Sincerely,
Bill Schaser

Delaplaine, Mark@Coastal

From: Lynne Mahony <ldmahony@gmail.com>
Sent: Tuesday, August 20, 2013 8:57 AM
To: Delaplaine, Mark@Coastal
Subject: Hwy 101 Arcata to Eureka, CA

Dear Mr. Delaplaine,
Thank you for reading my input to the the plans for the Eureka to Arcata 101 Corridor project.

The proposed project does not appear to make accomodations for bicycle or pedestrian traffic. My husband and the father of our young children bicycles to work on this route. This act is motivated by both personal well-being and an effort to decrease our nation's dependence on oil. The proposed project does not include a plan for non-motorized commuters and would decrease personal safety for pedestrians and bicyclists.. I urge you to couple the proposed project with a bike, pedestrian trail.

Thank you,
Lynne Mahony
2118 Daina Ct.
Arcata, Ca

Delaplaine, Mark@Coastal

From: Stephen Lindemann <selindemann@gmail.com>
Sent: Tuesday, August 20, 2013 7:54 AM
To: Delaplaine, Mark@Coastal
Subject: Eureka-Arcata 101 Corridor

Greetings Mark,

My name is Stephen Lindemann. Last year was my first time on the North Coast. I had traveled to Arcata from St. Louis, Missouri and made a stay for myself there for the entire year. By no means am I a Native, however, I had spent enough time there to get a real sense of the place and the spirit behind, not only it's landscape, but it's people. During my stay I was a vegetable farmer, mostly around the Indianola Cutoff. I worked and stayed on a piece of property just off of the round-about. I rode my bicycle between Eureka and Arcata quite frequently. Upon hearing of the project, I too thought of the other bicyclists, however, what really struck me was that the quaint, simple yet functional stretch of ground that runs between Eureka and Arcata, will be completely altered with the construction of a new overpass. What is in place now works just fine. Not to mention, the importance of the brackish water ecosystem and the fertile and delicate farmland that will all be compromised. I would like to know why and for what purpose there is a plan for the development of the Eureka-Arcata 101 Corridor. It all seems to be functioning and mutually beneficial the way it sits currently.
Any additional info would be nice, or perhaps your personal ideas. Also, as a Permaculture Designer and Farmer, I know that the execution of this development will be of greater harm than good to the existing systems that are already at play. (Community, Ecosystems, Migratory patterns, and so on..) I am sure that the Environmental Protection and Information Center (EPIC) are already compiling an extensive list of 'collateral damage' and 'values' of Caltrans.

Regards,
Stephen Lindemann

Delaplaine, Mark@Coastal

From: alisha oloughlin <thankfulmama@gmail.com>
Sent: Tuesday, August 20, 2013 6:46 AM
To: Delaplaine, Mark@Coastal
Subject: Caltrans Eureka-Arcata Corridor Project_ NO Project w/o Bay Trail

Dear Mr. Delaplaine:

As a bicycle commuter and former long-time resident, student and homeowner in Humboldt County, I've experienced firsthand the safety obstacles that the Eureka-Arcata Corridor presents to cyclists and pedestrians. Due to the existing conditions for cyclists/peds along this corridor, I was forced to commute for years to/from Eureka and Arcata via bus/bike rather than solely by bike as I would have preferred. I now live in Marin County and am witness to what implementation of great bike facilities can accomplish, as the cycling community here is very strong as a result. The same opportunities exist in Humboldt County and to let one so critically important as the Caltrans' Eureka-Arcata Corridor Project slip by without bike/ped improvements (the Bay Trail) will severely impact generations to come. Now is the time to provide members of the public the opportunity for a healthier and safer community and environment.

The Caltrans' project provides the perfect opportunity to address this long-overdue situation and must ensure safe access for bike commuters, touring cyclists, and pedestrians, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a Class I trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.

Thank you,

Alisha Oloughlin
332 Jean Street
Mill Valley, CA 94941

Delaplaine, Mark@Coastal

From: Cranston Snord <pvanmantgem@gmail.com>
Sent: Tuesday, August 20, 2013 5:43 AM
To: Delaplaine, Mark@Coastal
Subject: 101 needs a trail

Dear Mr. Delaplaine:
I'm writing to support the improvements planned on highway 101 between Eureka and California. But Caltrans' project must provide safe access for bike commuters, touring cyclists, and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.

Thank you,
Phil van Mantgem

Delaplaine, Mark@Coastal

From: Lynne Mahony <ldmahony@gmail.com>
Sent: Monday, August 19, 2013 10:56 PM
To: Delaplaine, Mark@Coastal
Subject: Mr. Delaplaine,

I am writing in regards to the plans proposed by CalTrans for the Hwy.101 corridor between Arcata and Eureka. Those plans apparently include a new interchange at Indianola Road and closing off the meridian between other points along the way.

Among my concerns for the proposed changes is that they will allow vehicule speeds to be increased to freeway standards.
Like many Humboldt residents, I was happy to see the speed lowered to 50 mph through the corridor some years back. Lowering the speed addressed safety issues that were present and resulted as well in a highway zone that is relaxing to drive through. For myself, and many others I'm sure, addressing safety issues and keeping lower highway speeds is the best choice for this area.

There is at present no adequate biking route between Arcata and Eureka, other than the 101 corridor. The wide shoulder and 50 mph speed limit combine to make this the safest route. This would be dramatically changed for a bicyclist if the speed limit were to raised. Even at 50 mph, the traffic running by a cyclist is frightening and intimidating. It would be intolerable at any higher speed.

Humboldt Bay is a beautiful part of our county and heritage. Let's make choices that help us protect and retain an appreciation for that beauty. Working on the interchanges might make the roadway safer, but we need to make sure we look at all alternatives and the impacts of any proposed changes. It certainly would be unacceptable to make changes that result in an even less safe environment for bicyclists.

Thank you,

Doug Moyer
2118 Daina Court
Arcata, CA 95521

Delaplaine, Mark@Coastal

From: julie neander <julieneander@gmail.com>
Sent: Monday, August 19, 2013 10:28 PM
To: Delaplaine, Mark@Coastal
Subject: Eureka Arcata 101 Corridor Improvement Project

Eureka-Arcata 101 Corridor Improvement Project
Revised Project Alternatives

Dear Mr. Delaplaine:

Thank you for the opportunity to comment on the revised project alternatives for the Eureka-Arcata 101 Corridor Improvement Project. The California Department of Transportation (Caltrans) proposes spending $30-60 million on this project with the stated purpose of improving safety and reducing traffic conflicts and intersection delays.

I believe this project is significantly flawed because it does not meet the requirements of the coastal act Section 30212 *(a)* - Public Access from the nearest public roadway to the shoreline and coast shall be provided in new development projects. It does not adequately address needed improvements to regional public transportation and bicycle and pedestrian mobility and coastal access in the Corridor project area. It also does not adequately address the projects green house gas impacts and mitigation for those impacts.

The project and its current alternatives focus almost entirely on motorized transportation issues and inadequately addresses public access to the coast and the multimodal transportation needs and issues on the Corridor and in the greater Humboldt Bay Region that could provide public access to the coast.

This project is ill-conceived because it does not adequately address public access related improvements to bicycle and pedestrian mobility and coastal access on the Corridor. Because of this, it is also incompatible with the Coastal Act as well as State and County Transportation Plans.

The Humboldt County Association of Governments (HCAOG) is the final authority for all of the decisions generated in the region's transportation planning and programming arena. HCAOG has developed the Humboldt County 2006 Regional Transportation Plan Update (County Transportation Update) to guide the County's transportation planning process over the next twenty years. The County Transportation Update has a goal to: "Create a transportation system that provides inter-community and intra-community non-motorized pedestrian, bicycle travel throughout the region." To meet this goal, the County Transportation Update includes nine policies to promote bicycle and pedestrian access and mobility in the County. Two of these policies and an objective of the County Transportation Update include:

> "D-5 Policy: Encourage bicycle-friendly design on all streets and roadways through new technologies, "best practices" standards, guidelines, and innovative treatments where appropriate on new roadways and multiuse paths.
>
> D-9 Policy: HCAOG recognizes the high level of public support for provision of a dedicated bicycle and pedestrian facility between Arcata and Eureka.

This Project is not compatible or consistent with any of the policies in the County Transportation Update Bikeways and Pedestrian Facilities Section because it virtually ignores the important issues of bicycle and pedestrian access and mobility.

Because this project does nothing to improve air quality or reduce petroleum energy consumption, provides no enhancements to bicycle and pedestrian access and mobility, and indeed is virtually silent on this issue, it appears this project is

incompatible with the state green house gas reduction policies. Rather, this project is growth-inducing and promotes automobile use and long-term traffic congestion which is in direct conflict with green house gas reduction requirements..

For these reasons this project is inconsistent with state and local policies and the Coastal Act. If the project were to be approved, it must be made compatible with State and County transportation plans and the Coastal Act by incorporating adequate coastal access and a robust bicycle and pedestrian element that includes a separate dedicated bicycle and pedestrian facility as well as substantial improvements to public transportation.

Sincerely Yours,

Julie Neander

1812 Fischer Ave.
McKinleyville, CA 95519

Delaplaine, Mark@Coastal

From: Karen Brooks <kbrooks61@gmail.com>
Sent: Monday, August 19, 2013 9:32 PM
To: Delaplaine, Mark@Coastal
Subject: Fwd: CalTrans Eureka-Arcata

Dear Mark
The Coastal Commission can play a proactive role in an upcoming Hwy 101 improvement. Millions of dollars are planned to be spent on an interchange/improvement between Eureka and Arcata.

I live off of Bayside Cutoff, which is an entrance/exit, on this Hwy 101. This project will affect me, my family and the 900 people living in this area.

The sentiment here is to use the funds targeted for this project on a sea level rise rail and trail improvement. **I would like the Coastal Commission to ask Cal Trans two things:**

1. **Work with NRCA (rail authority) and NWP (rail operator) to elevate and widen the rail prism to allow for both a rail with a trail on the bay side (west) of the Eureka to Arcata section of Hwy 101.**
2. **Use CalTrans' 60-100' right of way on the east side of Hwy 101 for another trail network. This will feed into several key neighborhoods: Sunnybrae, Bayside, Indianola, and Freshwater.**

More people would walk, bike, run, ride their horse, etc between Eureka and Arcata if they could do that safely. **Having pathways on BOTH SIDES OF THE HWY would greatly improve non-motorized modality.** These two paths would greatly improve our quality of life, provide modality to the elderly and poor, and most importantly.....save lives.

Thank you for reading and considering this.

Karen Brooks
707 498-1010 cell
707 822-7736 home
707 822-3085 fax

--
Abolitionist, Frederick Douglass, sought to embody three keys for success in life and I believe these are still true today:

- **Believe in yourself.**
- **Take advantage of every opportunity.**
- **Use the power of spoken and written language to effect positive change for yourself and society.**

Delaplaine, Mark@Coastal

From: Lorraine Dillon <ldillon@turfside.com>
Sent: Monday, August 19, 2013 8:18 PM
To: Delaplaine, Mark@Coastal
Subject: Eureka-Arcata Safety Corridor Project

Dear Mark Delaplaine,

My thanks to the Coastal Commission for reviewing CalTrans plans for the Eureka-Arcata Safety Corridor on Hwy 101.

It is most important that any project along this corridor be adapted to include a safe bike and walking route between the two major cities in Humboldt County. While I am able to ride my bicycle on Highway 101 for my commute to my job at Humboldt State University, I am afraid to do so because of the high number of collisions and fatalities that have been suffered by bicycle riders in our county. Riding from Eureka to Arcata necessitates crossing several interchanges where cars exit the highway at a high rate of speed. This section of 101 is the most used by bicyclists locally, and we need to have a trail component to encourage and protect non-motorized travel.

Thank you for your consideration.

Lorraine Dillon
2480 Redwood St.
Eureka, CA 95503
707 442-7367
707 616-7398 (cell)

Delaplaine, Mark@Coastal

From: Michael van Hattem <66steelfish@gmail.com>
Sent: Monday, August 19, 2013 7:56 PM
To: Delaplaine, Mark@Coastal
Subject: Eureka-Arcata 101 Improvement Project Comments
Attachments: dd_64_r1_signed_CALTRANS Multimodal.pdf; VanHattem101CorridorDEIRcomments12-08.pdf

August 19, 2013

Dear Mr. Delaplaine

I am sending you this message (with signed letter to follow) to urge you to ***not approve*** the CalTrans Eureka-Arcata Route 101 Improvement Project without the addition of a multimodal trail. CalTrans has disregarded its own directive (attached) and proposed a Project that will actually make cycling more dangerous than it currently is on the "Safety Corridor." To date, all that CalTrans has done for cyclists on the "Safety Corridor" is added a rumble-strip. The addition of a rumble-strip is not my idea of accommodating cyclists, it's merely an early warning system that lets you know you are about to be hit. Back in 2008, I wrote the attached letter to Ms. Floyd asking CalTrans to follow their own directive and provide this community with what it wants, a way to travel back and forth between Arcata and Eureka on a bicycle without significant risk. In 2008, I was a bike commuter, logging lots of round trips. I no longer commute on a bike because of the imminent danger. Now that we all have smart phones, we are all more distracted while driving than ever before, I trust you understand.

It's important that you know that a lot of people bicycle commute on the "Safety Corridor" daily. The "Safety Corridor" also is used by a large number of touring cyclists. We need a safe route; this Project will not provide safety or multimodal opportunities. Unfortunately, CalTrans does not seem to care about cyclists and the California Coastal Commission will have to act. Please tell CalTrans that this Project must accommodate cyclists, they need to include a trail, and they need Complete Streets!

Sincerely,

Michael van Hattem

December 12, 2008

Eureka-Arcata Route 101 Corridor Improvement Project

Dear Ms. Floyd,

I attended the open house and discussion of the two additional alternatives for the Eureka-Arcata Route 101 Corridor Improvement Project. I remain puzzled over your agencies inability to provide safe access for cyclists along the corridor. Bicyclists are the second largest user group, our numbers are increasing, and without question many more cyclists will be riding the corridor in the future. I trust that Caltrans understands that bike commuting is a desired approach to transportation in our community.

The current project alternatives do not represent *Complete Streets* as explained and mandated in Deputy Directive # DD-64-R1. Specifically, "The Department (Caltrans) views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system." Furthermore, "The Department develops integrated multimodal projects in balance with community goals, plans, and values." So I ask you- where is it, where is the integration and how is the current set of alternatives multimodal? Adding a rumble strip and supporting the development of an Arcata/Eureka trail independent of Highway 101 stacks up to literally nothing.

I think Caltrans can do better. I logged over 800 commute miles (40+ round trips) this year on my bike on the corridor. I am healthier and happier for it. The corridor is not safe for cyclists now and will be less safe with the alternatives that are proposed. Please follow your own directive and provide a safe and effective means for bicycle commuters to travel our 101 corridor. This is your chance to provide safe access to all users, not just the ones that choose to drive a car.

Sincerely,

Michael van Hattem
2033 Haeger Avenue
Arcata, CA. 95521

Deputy Directive

Number:	DD-64-R1
Refer to Director's Policy:	DP-22 Context Sensitive Solutions DP-05 Multimodal Alternatives DP-06 Caltrans Partnerships DP-23-R1 Energy Efficiency, Conservation and Climate Change
Effective Date:	October 2008
Supersedes:	DD-64 (03-26-01)

TITLE Complete Streets - Integrating the Transportation System

POLICY

The California Department of Transportation (Department) provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the State highway system. The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system.

The Department develops integrated multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian, and transit travel is facilitated by creating "complete streets" beginning early in system planning and continuing through project delivery and maintenance and operations. Developing a network of "complete streets" requires collaboration among all Department functional units and stakeholders to establish effective partnerships.

DEFINITIONS/BACKGROUND

Complete Street – A transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit riders, and motorists appropriate to the function and context of the facility.

The intent of this directive is to ensure that travelers of all ages and abilities can move safely and efficiently along and across a network of "complete streets."

State and federal laws require the Department and local agencies to promote and facilitate increased bicycling and walking. California Vehicle Code (CVC) (Sections 21200-21212), and Streets and Highways Code (Sections 890 – 894.2) identify the rights of bicyclists and pedestrians, and establish legislative intent that people of all ages using all types of mobility devices are able to travel on roads. Bicyclists, pedestrians, and nonmotorized traffic are permitted on all State facilities, unless prohibited (CVC, section 21960). Therefore, the Department and local agencies have the duty to provide for the safety and mobility needs of all who have legal access to the transportation system.

Department manuals and guidance outline statutory requirements, planning policy, and project delivery procedures to facilitate multimodal travel, which includes connectivity to public transit for bicyclists and pedestrians. In many instances, roads designed to Department standards provide basic access for bicycling and walking. This directive does not supersede existing laws. To ensure successful implementation of "complete streets," manuals, guidance, and training will be updated and developed.

RESPONSIBILITIES

Chief Deputy Director:

- Establishes policy consistent with the Department's objectives to develop a safe and efficient multimodal transportation system for all users.
- Ensures management staff is trained to provide for the needs of bicyclists, pedestrians, and transit users.

Deputy Directors, Planning and Modal Programs and Project Delivery:

- Include bicycle, pedestrian, and transit modes in statewide strategies for safety and mobility, and in system performance measures.
- Provide tools and establish processes to identify and address the needs of bicyclists, pedestrians, and transit users early and continuously throughout planning and project development activities.
- Ensure districts document decisions regarding bicycle, pedestrian, and transit modes in project initiation and scoping activities.
- Ensure Department manuals, guidance, standards, and procedures reflect this directive, and identify and explain the Department's objectives for multimodal travel.
- Ensure an Implementation Plan for this directive is developed.

Deputy Director, Maintenance and Operations:

- Provides tools and establishes processes that ensure regular maintenance and operations activities meet the safety and mobility needs of bicyclists, pedestrians, and transit users in construction and maintenance work zones, encroachment permit work, and system operations.
- Ensures Department manuals, guidance, standards, and procedures reflect this directive and identifies and explains the Department's objectives for multimodal travel.

District Directors:

- Promote partnerships with local, regional, and State agencies to plan and fund facilities for integrated multimodal travel and to meet the needs of all travelers.
- Identify bicycle and pedestrian coordinator(s) to serve as advisor(s) and external liaison(s) on issues that involve the district, local agencies, and stakeholders.
- Ensure bicycle, pedestrian, and transit needs are identified in district system planning products; addressed during project initiation; and that projects are designed, constructed, operated, and maintained using current standards.
- Ensure bicycle, pedestrian, and transit interests are appropriately represented on interdisciplinary planning and project delivery development teams.
- Provide documentation to support decisions regarding bicycle, pedestrian, and transit modes in project initiation and scoping activities.

Deputy District Directors, Planning, Design, Construction, Maintenance, and Operations:

- Ensure bicycle, pedestrian, and transit user needs are addressed and deficiencies identified during system and corridor planning, project initiation, scoping, and programming.
- Collaborate with local and regional partners to plan, develop, and maintain effective bicycle, pedestrian, and transit networks.
- Consult locally adopted bicycle, pedestrian, and transit plans to ensure that State highway system plans are compatible.
- Ensure projects are planned, designed, constructed, operated, and maintained consistent with project type and funding program to provide for the safety and mobility needs of all users with legal access to a transportation facility.
- Implement current design standards that meet the needs of bicyclists, pedestrians, and transit users in design, construction and maintenance work zones, encroachment permit work, and in system operations.
- Provide information to staff, local agencies, and stakeholders on available funding programs addressing bicycle, pedestrian, and transit travel needs.

Chiefs, Divisions of Aeronautics, Local Assistance, Mass Transportation, Rail, Transportation Planning, Transportation System Information, Research and Innovation, and Transportation Programming:

- Ensure incorporation of bicycle, pedestrian, and transit travel elements in all Department transportation plans and studies.
- Support interdisciplinary participation within and between districts in the project development process to provide for the needs of all users.
- Encourage local agencies to include bicycle, pedestrian, and transit elements in regional and local planning documents, including general plans, transportation plans, and circulation elements.
- Promote land uses that encourage bicycle, pedestrian, and transit travel.
- Advocate, partner, and collaborate with stakeholders to address the needs of bicycle, pedestrian, and transit travelers in all program areas.
- Support the development of new technology to improve safety, mobility, and access for bicyclists, pedestrians, and transit users of all ages and abilities.
- Research, develop, and implement multimodal performance measures.
- Provide information to staff, local agencies, and stakeholders on available funding programs to address the needs of bicycle, pedestrian, and transit travelers.

Chiefs, Divisions of Traffic Operations, Maintenance, Environmental Analysis, Design, Construction, and Project Management:

- Provide guidance on project design, operation, and maintenance of work zones to safely accommodate bicyclists, pedestrians, and transit users.
- Ensure the transportation system and facilities are planned, constructed, operated, and maintained consistent with project type and funding program to maximize safety and mobility for all users with legal access.
- Promote and incorporate, on an ongoing basis, guidance, procedures, and product reviews that maximize bicycle, pedestrian, and transit safety and mobility.
- Support multidisciplinary district participation in the project development process to provide for the needs of all users.

Employees:

- Follow and recommend improvements to manuals, guidance, and procedures that maximize safety and mobility for all users in all transportation products and activities.
- Promote awareness of bicycle, pedestrian, and transit needs to develop an integrated, multimodal transportation system.
- Maximize bicycle, pedestrian, and transit safety and mobility through each project's life cycle.

APPLICABILITY

All departmental employees.

Randell H. Iwasaki

RANDELL H. IWASAKI
Chief Deputy Director

October 2, 2008
Date Signed

Delaplaine, Mark@Coastal

From: Gordon Leppig <gleppig@humboldt1.com>
Sent: Monday, August 19, 2013 7:14 PM
To: Delaplaine, Mark@Coastal
Subject: Eureka-Arcata 101 Corridor Improvement Project

Eureka-Arcata 101 Corridor Improvement Project
Revised Project Alternatives

Dear Mr. Delaplaine:

Thank you for the opportunity to comment on the revised project alternatives for the Eureka-Arcata 101 Corridor Improvement Project. The California Department of Transportation (Caltrans) proposes spending $30-60 million on this project with the stated purpose of improving safety and reducing traffic conflicts and intersection delays.

I believe this project is significantly flawed because it does not adequately address needed improvements to regional public transportation and bicycle and pedestrian mobility and coastal access in the Corridor project area. The project and its current alternatives focus almost entirely on motorized transportation issues and inadequately addresses multimodal transportation needs and issues on the Corridor and in the greater Humboldt Bay Region.

All project alternatives, including the revised alternatives presented in December 2008, are incompatible with the Caltrans Deputy Directive #DD-64-R1, the California Transportation 2025 Plan (CTP), the Humboldt County Association of Governments (HCAOG) Humboldt County 2006 Regional Transportation Plan Update.

HCAOG Bicycle and Pedestrian Goals and Policies

This project is ill-conceived because it does not adequately address improvements to bicycle and pedestrian mobility and access on the Corridor. Because of this, it is also incompatible with State and County Transportation Plans.

The Humboldt County Association of Governments (HCAOG) is the final authority for all of the decisions generated in the region's transportation planning and programming arena. HCAOG has developed the Humboldt County 2006 Regional Transportation Plan Update (County Transportation Update) to guide the County's transportation planning process over the next twenty years. The County Transportation Update has a goal to: "Create a transportation system that provides inter-community and intra-community non-motorized pedestrian, bicycle travel throughout the region." To meet this goal, the County Transportation Update includes nine policies to promote bicycle and pedestrian access and mobility in the County. Two of these policies and an objective of the County Transportation Update include:

> "D-5 Policy: Encourage bicycle-friendly design on all streets and roadways through new technologies, "best practices" standards, guidelines, and innovative treatments where appropriate on new roadways and multiuse paths.

D-9 Policy: HCAOG recognizes the high level of public support for provision of a dedicated bicycle and pedestrian facility between Arcata and Eureka.

Objective: Promote the study of alternatives for a dedicated facility between Arcata and Eureka."

This Project is not compatible or consistent with any of the policies in the County Transportation Update Bikeways and Pedestrian Facilities Section because it virtually ignores the important issues of bicycle and pedestrian access and mobility.

Incompatibility with the California Transportation Plan

The Caltrans Mission is to "Improve mobility across California." By this, according to the Caltrans website, it means improved mobility for all means of transportation, not just automobiles and trucks. To help guide and implement this mission over the coming decades, the State developed the CTP.

According to the Caltrans website, "the CTP is a statewide, long-range transportation plan that provides for the movement of people, goods, services, and information. The CTP offers a blueprint to guide future transportation decisions and investments that will ensure California's ability to compete globally, provide safe and effective mobility for all persons, better link transportation and land use decisions, improve air quality, and reduce petroleum energy consumption."

The CTP Executive Summary states: "Often our only viable (transportation) alternative is to drive alone just like millions of other Californians already on our roadways. The lack of options for getting from here to there is the result of choices—individual choice, but also choices made by those responsible for building our communities and the supporting infrastructure." The Executive Summary goes on to ask, among other questions: "Can I easily walk or ride my bicycle?" "I can choose to make informed decisions about how our communities will grow into the future...integrating decisions about how I provide mobility and access; and how I enhance the environment in which I live."

The CTP vision is one of a "fully integrated, multimodal, sustainable transportation system that supports quality of life, a prosperous economy, and quality environment, and social equity." The CTP has a Bicycle and Pedestrian Element intended to provide a long-term vision and guidance for developing bicycle and pedestrian facilities in California. Improving air quality and reducing petroleum energy consumption are central tenants of the CTP, yet none of the project alternatives substantially addresses these issues. Rather, this project is growth-inducing and promotes automobile use and long-term traffic congestion.

Because this project does nothing to improve air quality or reduce petroleum energy consumption, provides no enhancements to bicycle and pedestrian access and mobility, and indeed is virtually silent on this issue, it appears this project is incompatible with the CTP.

Consequently, I dont believe this project comports with state or local Policy or the Coastal Act. If the project were to be approved, it must be made compatible with State and County transportation plans and the Coastal Act by incorporating adequate coastal access and a robust bicycle and pedestrian element that includes a separate dedicated bicycle and pedestrian facility as well as substantial improvements to public transportation.

Sincerely Yours,

Gordon Leppig

1812 Fischer Ave.
McKinleyville, CA 95519

Delaplaine, Mark@Coastal

From: Colleen Clifford <dunebean@gmail.com>
Sent: Monday, August 19, 2013 3:40 PM
To: Delaplaine, Mark@Coastal
Subject: 101 project

NO PROJECT WITHOUT THE BAY TRAIL INCLUDED IN THE PLANNING!
Please.

Thanks,
Colleen Clifford
Manila, CA

Delaplaine, Mark@Coastal

From: Lawrence Wieland <lawrencewieland@gmail.com>
Sent: Monday, August 19, 2013 3:09 PM
To: Delaplaine, Mark@Coastal
Subject: Bike trails Eureka to Arcata

Hi,
I am a resident in Eureka. I do not think Cal trans should be doing any revising of the 101 corridor between Eureka and Arcata without developing a safe bike trail. The section from Eureka to Arcata for safe bike passage without the dangers of cars is critical to the advancement of alternative transportation, healthy living and recreational activities.
Lawrence Wieland, MD

Delaplaine, Mark@Coastal

From: Eugene Perricelli <ceperr@sbcglobal.net>
Sent: Monday, August 19, 2013 2:23 PM
To: Delaplaine, Mark@Coastal
Subject: Highway 101 Eureka Safety Corridor

It is unconscionable that this project is even being considered without improvements for cyclists and pedestrians, let alone taking sea level rise into consideration.

The current structure actually works pretty well, better I fear than the Cal Trans wished for alternative would.

Thank you for considering my opinion. I am a regular user of the corridor, both in car and on bike.

Claire Perricelli, 2259 16th, Eureka, 95501

Delaplaine, Mark@Coastal

From: Rick Littlefield <ricknatural@yahoo.com>
Sent: Monday, August 19, 2013 2:14 PM
To: Delaplaine, Mark@Coastal
Subject: Eur/Arcata Safety Corridor-Humboldt Bay Trail

Hello Mark,
I would like to register our concern and sincere hope that the Eureka - Arcata Safety Corridor Project must include a pedestrian and bicycle friendly trail in this project. May of our customers and several of our employees use this primary access for work and tell us that it is currently unsafe. Please add our concerns to the list of folks that insist that this access include a bike and pedestrian friendly trail.
Thanks,

Rick Littlefield, Owner
Eureka Natural Foods
707.442.6325 707.442.8199(fax)

Delaplaine, Mark@Coastal

From: Mike Cox <mgcox2@yahoo.com>
Sent: Friday, August 16, 2013 6:11 PM
To: Delaplaine, Mark@Coastal
Cc: Mike Cox
Subject: Caltrans project in Eureka

No project without the Bay Trail! Caltrans' project must provide safe access for bike commuters, touring cyclists, and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.

Additional concerns I have about Cal Tran's plan include:

- **The plan for Coastal Flooding and Sea Level Rise:** Highway 101 is currently at risk of flooding during extreme high tides and major storms. The railroad berm and dikes, which are currently the only protection from high water levels, are eroding – putting the 101 corridor at even greater risk. Sea level rise will only add to these problems. Work on the highway, trail, and rail corridors should all be planned together while taking into account storms, high tides, and projected sea level rise. Caltrans needs to address these issues before any action is taken on the 101 corridor project.

- **Address Impacts to Surrounding Communities:** Closure of the Bayside median and construction of a capacity-increasing interchange is likely to result in increased traffic on Old Arcata Road. Caltrans must consider and address the impacts resulting from the project to Old Arcata Road and other routes. Caltrans should also carefully consider the many reasonable project alternatives put forth by local agencies and the public.

Delaplaine, Mark@Coastal

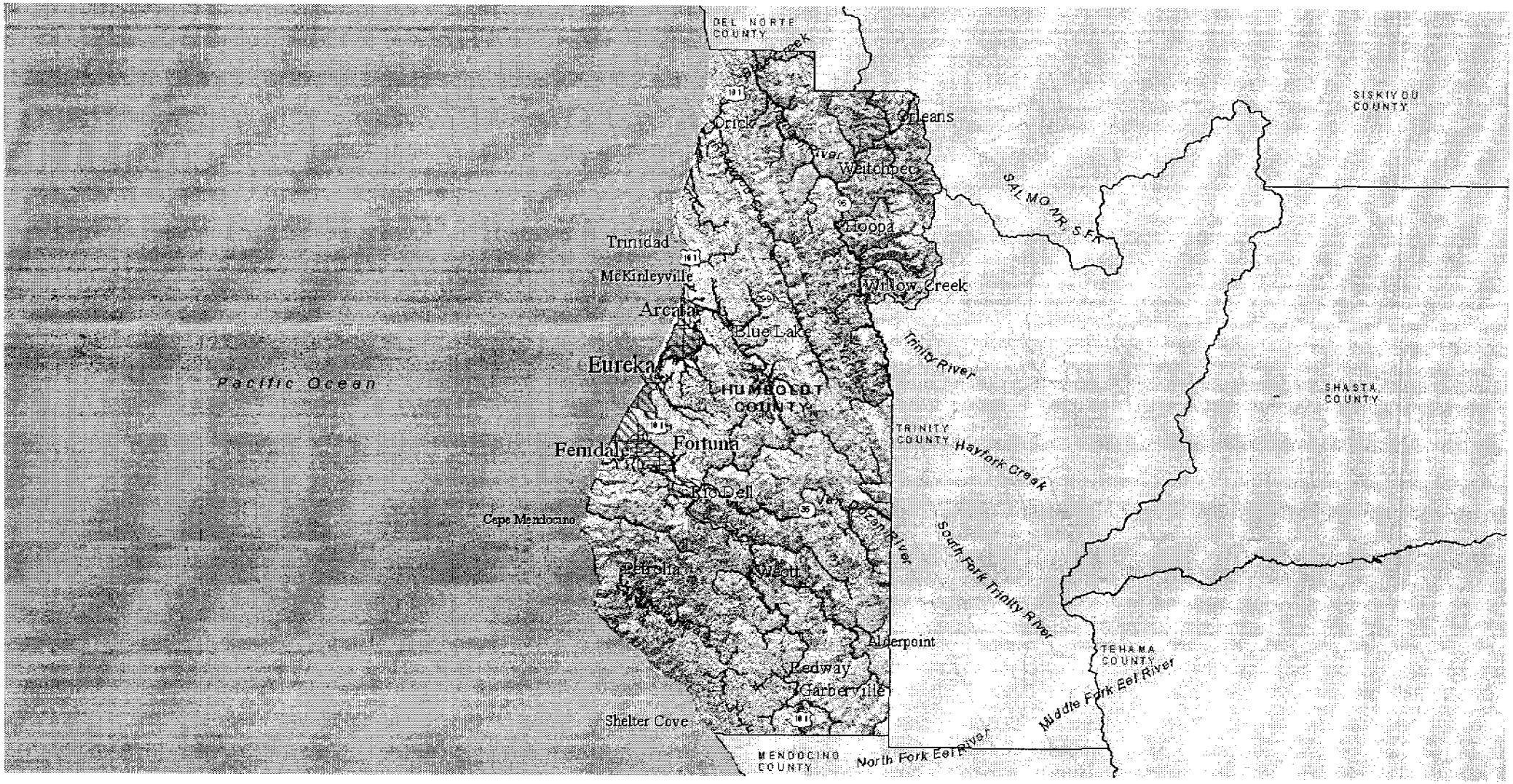
From: A Lee <rockygulch95524@gmail.com>
Sent: Friday, August 16, 2013 8:45 PM
To: Delaplaine, Mark@Coastal
Subject: Fwd: Public Comment for CCC: Deny HCAOG and CalTrans Consistency Certification for the Highway 101 Corridor Project
Attachments: HumGIS FEMAFloodZones Map.php.jpg; HumGIS TsunamiEvac Map.php.jpg; HumGIS innundation map.php.jpg; Humboldt Bay SeaLevelRise Rept LairdA Figure 33 Salt Marsh Distribution 2009.doc; Public Comment for CCC 08 16 13 AliOLee.doc

Mr. Delaplaine and the California Coastal Commission:

Please accept the attached letter and maps for the public comment process in response to the Humboldt County Association of Governments and CalTrans' Highway 101 Corridor Proposal under consideration.

Thank you.

Ali O. Lee
322 Rocky Creek Road
Bayside, CA 95524
rockygulch95524@gmail.com


DEL NORTE COUNTY
SISKIYOU COUNTY
SHASTA COUNTY
TRINITY COUNTY
TEHAMA COUNTY
MENDOCINO COUNTY
HUMBOLDT COUNTY
Pacific Ocean
Cape Mendocino
Orick
Orleans
Weitchpec
Hoopa
Willow Creek
Trinidad
McKinleyville
Arcata
Blue Lake
Eureka
Ferndale
Fortuna
Rio Dell
Petrolia
Weott
Alderpoint
Redway
Garberville
Shelter Cove
SALMON R. S.F.
Trinity River
Hayfork Creek
South Fork Trinity River
Van Duzen River
Middle Fork Eel River
North Fork Eel River
101
36
299
96
95

Delaplaine, Mark@Coastal

From: Briar Bush <briarbush@lostcoast.com>
Sent: Monday, August 19, 2013 12:10 PM
To: Delaplaine, Mark@Coastal
Subject: Humboldt Trails Council Support

To Whom it may Concern and Mark Delaplaine,

As a cyclist, motorist and long time resident of Eureka/Arcata I find myself on the Safety Corridor very frequently for work and pleasure logistics. At age 57 I pay far more attention to safety in this corridor than perhaps a couple of decades ago. Increased traffic and cyclist activity is certain to expand (as it has over the past few decades) in coming years compounding fears that exist on that corridor and/or other roads that mitigate that corridor's use.

I also realize that a "chain is only as strong as its weakest link". The CalTrans project to ensure safety between the two communities is a must and should remain a high priority towards resolve that includes bike/cyclist safety as well as automobile.

I urge you and all involved to adopt a program for a comprehensive Bay Trail that will allow for better/effective cycling/biking travel between Eureka-Arcata on the Safety Corridor.

Thank you,

Dean "Briar" Bush
Resident, Employed and Conscientious Citizen
Eureka, CA

Like Tweet Share

HUMBOLDT TRAILS COUNCIL

Dear Briar,

This email clarifies/updates the views of the HTC board regarding the Bay Trail and CalTran's project. Please review and consider sending comments to the Coastal Commission TODAY.

For the Humboldt Trails Council, our top priority is safe non-motorized transportation and enhanced opportunities for recreational trails. Although there are many issues related to the Eureka-Arcata Safety Corridor project, we feel that the improvements should be made for safe bike and pedestrian facilities as a part of projects that provide safety improvements for vehicles. This is a regional project and Caltrans and local agencies have the duty to provide for the safety and mobility needs of all who have legal access to the transportation system.

Therefore we urge you to tell the Coastal Commission **No project without the Bay Trail!** Caltrans' project must ensure safe access for bike commuters, touring cyclists, and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a Class I trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.

Please send your comments to the California Coastal Commission by August 20!

by email: mark.delaplaine@coastal.ca.gov
by U.S. mail:
Mark Delaplaine 45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Thank you for your support during this critical planning period. Input from the community is key.

Respectfully,
The Humboldt Trails Council

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Humboldt Trails Council
PO BOx 6625
Eureka, CA 95502
US

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Delaplaine, Mark@Coastal

From: Ken Miller <tamer1@suddenlink.net>
Sent: Monday, August 19, 2013 10:33 AM
To: Delaplaine, Mark@Coastal
Subject: Eureka rcata 101 Corridor Project

Mark Delaplaine 45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Dear Sir,

No project without the Bay Trail!

In addition to the other issues regarding sea level rise and the Indianola Interchange.

Thank you,

Ken Miller, MD
1658 Ocean Drive
McKinleyville, CA 95519

Delaplaine, Mark@Coastal

From: Julie Fulkerson <juliefulkerson@mac.com>
Sent: Monday, August 19, 2013 8:28 AM
To: Delaplaine, Mark@Coastal
Cc: Fulkerson Julie
Subject: Humboldt 101 Corridor Project

Honorable Coastal Commissioners,

I am writing to urge you to consider the Bay Trail project proposed in conjunction with the 101 Corridor improvements. Originally I opposed this road expansion because I have noted for years, the importance and value of a safe recreational trail project. Now, with the addition of the trail, it seems a more appropriate project since non-motorized vehicles and pedestrians will be included. This will provide a rare opportunity to observe Bay habitat and the natural environment.

I am excited that this project could ensure safe access for bike commuters, touring cyclists, and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a Class I trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route.

This will be a model project for the State of California. I am sure the trail will swarm with bicycles as soon as the path is open. This is a coastal and environmental dream come true...and it will have enormous economic and tourism advantages as well.

with gratitude,

Julie Fulkerson
Business Owner
Former Member of Humboldt County Board of Supervisors Current Mayor of Trinidad

Delaplaine, Mark@Coastal

From: Lori Goodman <loribg@suddenlink.net>
Sent: Monday, August 19, 2013 7:46 AM
To: Delaplaine, Mark@Coastal
Subject: Eureka - Arcata Coastal trail

Dear Mr. Delaplaine,

I am appalled and surprised to learn that cal trans is even considering not installing a trail between Eureka and Arcata. This has been in the works for many years, is supported by the community, is necessary to help complete the California Coastal Trail, and a very necessary part of this community.

I urge that there be no Eureka Arcata coriander improvement without a trail!!

Sincerely,

Lori Goodman

Delaplaine, Mark@Coastal

From: Chris Weston <chriswestonsr@yahoo.com>
Sent: Monday, August 19, 2013 7:28 AM
To: Delaplaine, Mark@Coastal
Subject: No Hwy 101 Aracata-Eureka Project Without the Bay Trail

Hi Coastal Commission:

For the Humboldt Trails Council and many other local organizations and residents, our top priority is safe non-motorized transportation and enhanced opportunities for recreational trails. Although there are many issues related to the Eureka-Arcata Safety Corridor project, including the need to accommodate sea level rise due to global warning, we demand that the improvements be made for safe bike and pedestrian facilities as a part of projects that provide safety improvements for vehicles. This is a regional project and Caltrans and local agencies have the duty to provide for the safety and mobility needs of all to the transportation system.

Therefore, we urge the Coastal Commission to tell Caltrans: **No project without the Bay Trail!** Caltrans' project must ensure safe access for bike commuters, touring cyclists, and other non-motorized recreationalists and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a Class I trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans must not be allowed to move forward until they agree to provide a safe route for cyclists, other non-motorized recreationalists and pedestrians alike by incorporating the Humboldt Bay Trail as part of the project.

Regards,

Chris Weston
P.O. Box 185, Phillipsville, CA 95559
Tel. 707-223-2226

Delaplaine, Mark@Coastal

From: Timothy Daniels <twowheelintim@sbcglobal.net>
Sent: Monday, August 19, 2013 6:47 AM
To: Delaplaine, Mark@Coastal
Subject: Highway 101 project

Good Day Mr. Delaplaine,

I'm writing to urge you to recommend Caltrans never be allowed to proceed with the 101 corridor project between Arcata and Eureka. That stretch of road is one of the last few sections of highway that is even remotely safe to ride around here. It is a key artery for cyclists to traverse between Arcata and Eureka, and several points in between. Even if a trail were to be built (which I sincerely doubt will ever happen), the 101 project will effectively cut off cyclists from Bayside Road, Indianola Cutoff, and the KOA half way between the two, a very popular camping spot for bicycle tourists passing through. As the KOA is on the east side of the highway, southbound cyclists must cross over the highway to get there.

I don't believe that saving motorists ninety seconds is worth cutting off people who chose to not drive a car. It's just plain wrong.

Sincerely,

Timothy Daniels

A concerned bicycle commuter.

1734 Roberts Way, Arcata CA 95521
August 18, 2013

California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219
Attn.: Mark Delaplaine

Re: Support for Commission Staff report objecting to CalTrans Eureka - Arcata Route 101 Corridor "Improvement" Project

Dear California Coastal Commission:

In summary, the Commission should reject CalTrans' proposal for all the reasons stated in the staff report, and because it makes travel more dangerous for some motor vehicles and for all bicycles, and because it fails to protect the highway from rising sea level.

It appears that CalTrans' goal is to make the corridor into a freeway with 65 + mph traffic, with bicycles right next to it. There is no need for a freeway between Arcata and Eureka because the current 50mph limit is entirely satisfactory for cars, although it is currently quite dangerous for cyclists. As a cyclist I know.

Caltrans' proposal makes travel more dangerous for some cars and for other travelers such as pedestrians and cyclists. For example, CalTrans proposes to close median openings across 101, which degrades neighboring traffic flow.

CalTrans has ignored two key issues: the need to protect the highway from sea level rise and the use of NCRA right-of-way to provide a separate trail or railbanking.

CalTrans has heretofore ignored sea level rise and storm threats to the corridor. **This section of 101 is the one in California most in danger from sea level rise.** The absurdity of CalTrans' current plan for construction without protection from sea level rise is that the proposed Indianola interchange will be an island in salt water before its otherwise useful life is over.

Further, their proposal to contribute a million dollars to a ten million trail project only (maybe) after they've built their interchange is blackmail. This is CalTrans acting like a bully, and I cannot believe that such a scheme came from local CalTrans staff.

The section entitled "What about a separated trail for bicyclists and pedestrians?" in CalTrans' "Bicycle and Pedestrian Access and the Eureka-Arcata Corridor Improvement Project" fails the reasonableness test. For example, CalTrans claims that mixing bicycles and cars at freeway speeds is safe; all recent experience shows this is false, and their proposed bike lanes are more likely to be blood-red colored

than brick-red (CalTrans terminology) colored.

CalTrans should adopt a goal that would make travel safer or at least no worse for everyone, which is Caltrans' obligation in its enabling legislation. Specifically, **CalTrans should provide a trail for cyclists and pedestrians, the potential for eventual rail (perhaps railbanking), and a highway protected from sea level rise.** This plan would make wetland damage much less as well.

I believe there's plenty of room in CalTrans' right-of-way for highway, rail and trail, even without moving the highway. If I am wrong, then CalTrans can move the entire highway over, as it currently proposes (to save the trees, but why?), so that there is room for rail and a separate trail. They can do that without NCRA.

However, corridor protection must involve the NCRA property, and CalTrans should protect the highway by enhancing the NCRA prism, which is already failing. See photo attached. NCRA is bankrupt and has no plans or resources to do anything with that right-of-way. Like a dog in the manger, NCRA has denied access by opposing railbanking. They've also adopted bicycle trail "standards" that effectively prohibit trails on their property. It is clearly in the public interest to reject NCRA's denial of railbanking. This would also enable a safe coastal trail.

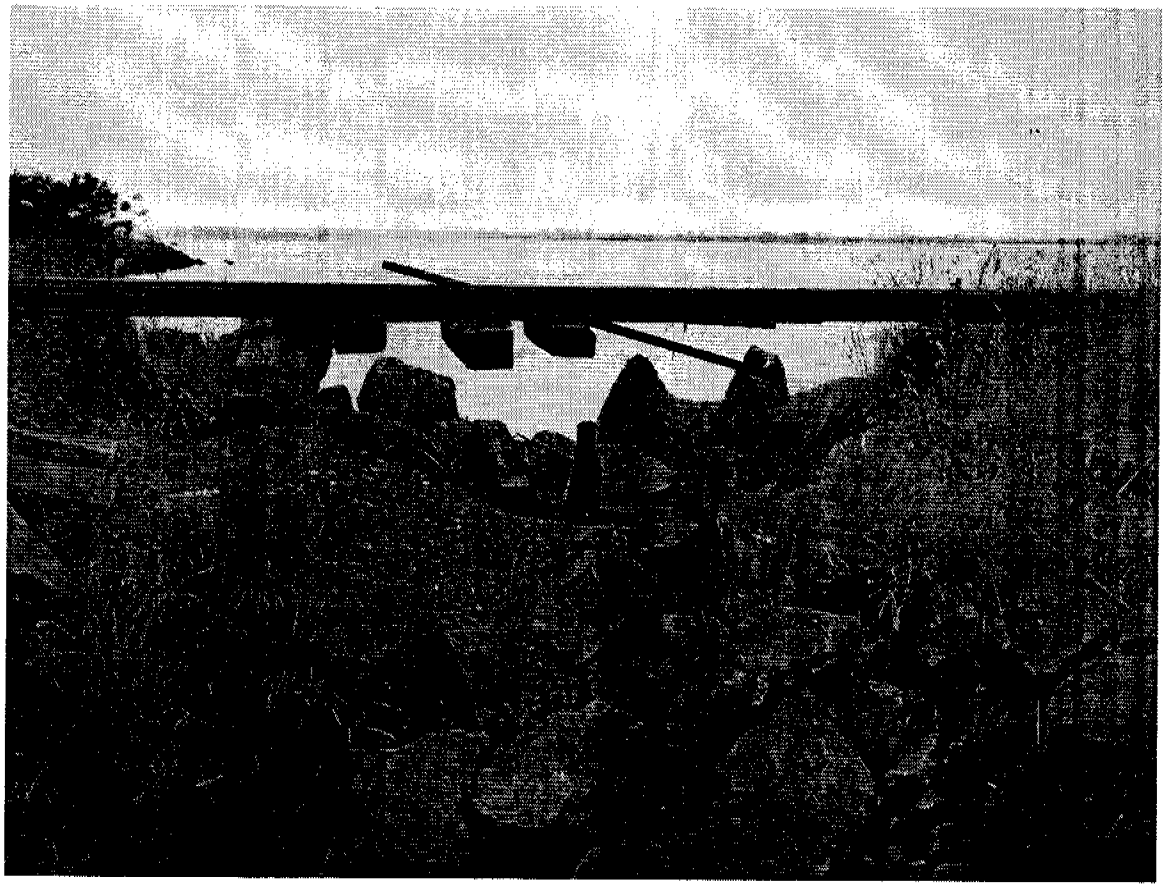
With NCRA bankrupt surely a deal can be cut, if all agencies pull together for a sensible plan. The key agency to make this work is the Coastal Commission.

Thank you, and I shall look forward to hearing your decision.

Sincerely,

John Schaefer, Ph.D.

cc
Senator Noreen Evans
Assemblyman Wes Chesbro



Storm Damage on NCRA Threatens Highway 101 (photo 8/18/13)

Delaplaine, Mark@Coastal

From: Kelly Love <kelly29love@gmail.com>
Sent: Saturday, August 17, 2013 4:27 PM
To: Delaplaine, Mark@Coastal
Subject: Caltrans 101 project

I am a long time resident of Humboldt county. I am a father of three and I have a grandaughter. All members of my family are cyclist. We are also very conscious of ecology and practice environmental sustainability. As a cycling commuter who uses the 101 highway for traveling, I am not in support of any changes to the 101 saftey cooridor that prevents cyclist from safely traveling between Arcata and Eureaka. Do not proceed with any construction on 101 that inhibits cyclist from safely traveling this route. Old Arcata Road does not have safe cycling lanes for the entirety of the road. The route over the bridges to Manila is not safe for cyclist. We want the 101 to be safe for all forms of transportation.

Delaplaine, Mark@Coastal

From: paula brockington <paulabrock@sbcglobal.net>
Sent: Saturday, August 17, 2013 9:19 AM
To: Delaplaine, Mark@Coastal

Dear Mr. Delaplaine,

I am writing this letter to express my concern over Cal Trans's proposed overpass project on Hwy 101. Many dedicated and motivated citizens are currently riding their bikes to and from work between Arcata and Eureka, and risking their lives to do so. We have had several tragic loss of lives on 101 in the past few years from cars hitting cyclists. The proposed Bay Trail needs to take priority as it will be an important link to completing the coastal trail that everyone can enjoy safely. Closing 101 for any length of time will cause considerable problems for commuters as Old Arcata Rd. is the only alternate route and cannot accomodate the increased traffic. The risk for flooding on 101 is also a permanent threat. Please require Cal Trans to provide safe and thorough study and public consideration of this project and require them to complete the Coastal Trail for those health conscious and environmentally responsible citizens. Humboldt should be considered a bicycle-friendly community as so many of our northern Californian neighbors. Thank-you for your consideration.

Sincerely, Paula Brockington, RN

Delaplaine, Mark@Coastal

From: Lee House <leehouse@suddenlink.net>
Sent: Friday, August 16, 2013 10:36 PM
To: Delaplaine, Mark@Coastal
Subject: Eureka-Arcata Hwy 101

Dear Sir, This note may not be exactly on target, but the current safety corridor (50 mph) is a peaceful, pleasant situation. I do not mind the slow down and relax opportunity. Normally I like to drive as fast as anyone, but that particular stretch of road is much better now than it used to be, when all the cars (i.e. drivers) were trying to edge slightly faster than the other, often needing to go over 65 mph to maintain advantage. That weird feature, that feeling, is unique to the segment between Arcata and Eureka.

Certainly a priority for any future improvements should be directed to adding a pedestrian & bicycle designated pathway.

Sincerely, Lee House.

Delaplaine, Mark@Coastal

From: Colin Fiske <colin.fiske@gmail.com>
Sent: Friday, August 16, 2013 12:25 PM
To: Delaplaine, Mark@Coastal
Subject: Comments Regarding Consistency Certification CC-016-13 (Caltrans Eureka-Arcata Rte 101 Project)

Mr. Delaplaine:

I am extremely concerned at the implications of the proposed Caltrans "Corridor Improvement Project" on Route 101 between Eureka and Arcata. My concerns are two-fold:

(1) The destruction of wetlands, particularly in this type of coastal environment bordering Humboldt Bay, is unwarranted and unwise. With all that is now known about the important ecological functions provided by wetlands, and the likely impacts to this coastal environment in the near future resulting from climate change and sea level rise, it is hard to believe we are still considering destroying large acreages for highway expansion projects.

(2) The project would increase traffic speeds without making any accommodation for bicyclists and pedestrians. As a bicyclist who lives in this community and has traveled this corridor, I can say that I would use it more if better infrastructure were in place, and would use it less if traffic speeds increased with no additional safety measures in place. Our community critically needs a better, safer, more convenient bicycle and pedestrian route between Arcata and Eureka, and this project takes a step in the wrong direction.

Therefore, I agree with the Coastal Commission's staff recommendations, and urge the Commission to make a finding of inconsistency if no major changes are proposed to reduce or eliminate wetlands impacts, to include critical bicycle and pedestrian infrastructure, and to address issues of climate change and sea level rise.

Thank you for your consideration.

Sincerely,

Colin Fiske
1440 Anderson Ave.
McKinleyville, CA 95519

Delaplaine, Mark@Coastal

From: richard kossow <richardk@humboldt1.com>
Sent: Friday, August 16, 2013 4:03 PM
To: Delaplaine, Mark@Coastal
Subject: Arcata-Eureka freeway corridor

Please do not allow the Caltrans changes without better provisions for non-vehicular travel. Actually keeping the speed limit as it is would be in the public interest.

RKossow, Arcata

Delaplaine, Mark@Coastal

From: Patricia-Anne WinterSun <p-aws@sbcglobal.net>
Sent: Thursday, August 15, 2013 12:38 PM
To: Delaplaine, Mark@Coastal
Subject: No to Caltrans 101 Corridor Project without the Bay Trail

Mark Delaplaine
California Coastal Commission
Dear Sir,
We are opposed to the Caltrans' proposal for the Eureka-Arcata 101 Corridor. Increasing speeds along this corridor is not an improvement for cyclists and pedestrians. This part of 101 is also designated as the Pacific Coast Bike Route so any project thereon must at least not decrease the safety of those using the Route. Caltrans' project must provide safe access for bike commuters, touring cyclists, and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a trail along Humboldt Bay. **It is unacceptable for Caltrans to turn the 101 Corridor adjacent to Humboldt Bay into a high-speed freeway without safe accommodations for cyclists and pedestrians.** Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.

--
Yours in bicycling for fun and transportation,
Patricia-Anne and George WinterSun
Eureka, California 95501

Delaplaine, Mark@Coastal

From: barefootbutner@gmail.com on behalf of Chris Butner <chris.butner@completestreetsadvocate.org>
Sent: Thursday, August 15, 2013 10:10 AM
To: Delaplaine, Mark@Coastal
Subject: Eureka/Arcata highway 101 improvement project

Hi Mark,

I writing to you today to express my feelings of the 101 Eureka/Arcata safety corridor. First, I want to thank the commission for holding the hearing before the local residents in Eureka.

In our community non-motorized transportation has been gaining a lot of momentum. Similar to other communities throughout the nation. I also consider our 101 safety corridor coastline to be a beautiful section to enjoy the Humboldt bay wildlife, and I wish I had easier access to this jewel.

I want to encourage that the commission hold your ground that the proposed overpass is too much environmental impact for this area. Also keep in mind that the current corridor conditions have already reduced greatly collisions at the cross traffic locations. So why do we need to create new impacts to this delicate environment, that will reduce coastal access? The combination of all proposed changes will encourage Caltrans to increase speeds in due time. A freeway in this section is not warranted under these conditions with the coast, and the desired increase in non-motorized users.

Caltrans repaving project is currently increasing the shoulder to ten feet, and it will be colorized. This is a great short term step, but this is not a long term solution. With the current posted speed it is a very unpleasant space to ride a bicycle, and a few extra feet won't change this. We do have movement with the high profile rail with trail next to the highway, and Caltrans has put up 1 million dollars towards the project. I feel that since Caltrans is a multi modal agency they can contribute more funding to the project. The rail with trail is estimated at 18 million, and Caltrans should be more involved in pushing this project forward.

I ask that you deny the current proposals from Caltrans. I believe it is important to remember that the 101 is a public right of way. The community plays an important role in how we move forward. I ask that the coastal commission understand the communities need for better non-motorized access to our precious coastline. The current Caltrans proposal is not good enough to meet this need. I would like to see Caltrans delay the improvement project so the bay trail can be implemented, then we can review what changes to make to the 101 corridor highway.

I appreciate your time very much, and appreciate the commission taking my comments under consideration. I've also created a new space online that allows all of us interested to see what the rail line conditions look like, currently. I'd be happy to share these pictures with you.

I look forward to hearing your decision in the upcoming hearing.

Chris Butner
http://completestreetsadvocate.org/

August 15, 2013

California Coastal Commission
1385 8th Street, Suite 130
Arcata, CA 95521

Attention: Mr. Mark Delaplaine

I am writing to request that the California Coastal Commission deny the Highway 101 Eureka - Arcata Corridor Project as proposed by CalTrans.

After living along Old Arcata Road in Bayside, California for 39 years, I believe that CalTrans must dedicate adequate attention to critical details in planning for this project on Highway 101. My concerns are:

(1) Closing the Bayside Cut-off will restrict access from the Bayside community to the Humboldt Bay, causing all residents living between the Bayside Post Office and the Rocky Creek area to drive several extra miles to access the Bay.

(2) Traffic from 101 will shift over to Old Arcata Road, with more cars driving faster through our residential community with three elementary schools and no mitigation proposed.

(3) The project will fill more than 10 acres of wetlands without adequate mitigation. CalTrans' traffic volume studies from several years ago have proven to be inaccurate; there are less vehicles than they had projected and it is reasonable to anticipate fewer vehicles in the future. The significant negative environmental impacts of this project are not a reasonable trade-off for the anticipated amount of traffic.

(4) We have observed increased flooding . The Humboldt County Association of Governments is conducting a "Climate Change Adaptation Pilot Strategy for Critically Vulnerable Assets in Northwest California" study that has not been completed. This report will have critical information for this project. With sea level rise, it will be necessary for a firm commitment from CalTrans for ongoing maintenance of a trail built along the Bay.

It's time for CalTrans to go back to the drawing board, complete and update its studies and work much more closely with the community for the best project.

Sincerely,

Margaret A Gainer

Margaret A. Gainer
2290 Graham Road
Bayside, California 95524

Delaplaine, Mark@Coastal

From: cemone@reninet.com
Sent: Thursday, August 15, 2013 7:53 AM
To: Delaplaine, Mark@Coastal
Subject: 101 Corridor comment

Dear Coastal Commission:

I thank the Northcoast Environmental Center for providing the following three points, with which I agree completely:

1. It is unacceptable for Caltrans to turn the 101 Corridor adjacent to Humboldt Bay into a high-speed freeway without safe accommodations for cyclists and pedestrians. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.

2. Highway 101 is currently at risk of flooding during extreme high tides and major storms. The railroad berm and dikes, which are currently the only protection from high water levels, are eroding – putting the 101 corridor at even greater risk. Sea level rise will only add to these problems. Work on the highway, trail, and rail corridors should all be planned together while taking into account storms, high tides, and projected sea level rise. Caltrans needs to address these issues before any action is taken on the 101 corridor project.

3. Closure of the Bayside median and construction of a capacity-increasing interchange is likely to result in increased traffic on Old Arcata Road. Caltrans must consider and address the impacts resulting from the project to Old Arcata Road and other routes. Caltrans should also carefully consider the many reasonable project alternatives put forth by local agencies and the public.

Carol Moné
Box 223
Trinidad, California 95570

"We must not be frightened nor cajoled into accepting evil as deliverance from evil. We must go on struggling to be human, though monsters of abstractions police and threaten us." -Robert Hayden [Asa Bundy Sheffey], poet and educator (1913-1980)

Delaplaine, Mark@Coastal

From: Jane Williams <janewilliams99@gmail.com>
Sent: Thursday, August 15, 2013 7:51 AM
To: Delaplaine, Mark@Coastal
Subject: Caltrans needs to do a better job!

As a resident of Trinindad, I object to allowing Caltrans to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.
No project without the Bay Trail!
Caltrans' project must provide safe access for bike commuters, touring cyclists, and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route.

Jane Williams, MD

Delaplaine, Mark@Coastal

From: Ed & Anna Bernard <eabern@aol.com>
Sent: Thursday, August 15, 2013 7:45 AM
To: Delaplaine, Mark@Coastal
Subject: 101 corridor between Arcata and Eureka

Hi Mark,

Firstly, I am against this project altogether: 101 corridor between Arcata and Eureka
I lived in LA for 25 years where freeways are everywhere and are needed to support the volume of traffic.
I have lived in Humbold County for 8 years and I see NO NEED TO EXPAND THE 101 between Arcata and Eureka.
There just is not enough traffic to justify spending the money on this project.
The people that live here and drive on the 101 know this is true.
Caltrans appears to have a mission to expand the 101 from Mexico to Oregon, whether is is needed or not.
The beauty of Humboldt Bay should be taken into consideration and protected.

Secondly, if we are beyond the point of no return (and the expansion will happen no matter what), then...
I do agree with the Northcoast Environmental Center:
1) incorporate a Bay Trail
2) take rising tides and deteriorating sea walls into account and repair or improve
3) increased road traffic due to closure of exits needs to be addressed.

Thanks for your efforts to protect our coastline.

Anna Bernard
3232 Alliance Road
Arcata, CA 95521
707 826-7247

Delaplaine, Mark@Coastal

From: Russell Kramer <northcoastrat@gmail.com>
Sent: Thursday, August 15, 2013 7:33 AM
To: Delaplaine, Mark@Coastal
Subject: 101 corridor improvements

Hello Mark,

I'm writing in regards to CalTrans' proposed "improvements" between Arcata and Eureka on HWY 101. Increased speeds (from 55 to 65 mph) for the 8.4 miles between the cities would lead to decrease a commute time from 9.2 to 7.8 minutes. Does this justify an overpass and what I am guessing is over 1 million dollars in expenditures?

If the objective is increased safety rather than commute time this project will also be a bust. Whenever I travel this section of highway there are alway cyclists and sometimes pedestrians walking to and from Eureka. Who are we trying to increase safety for? Everyone, or just motorists? It would be folly to allow CalTrans to continue with these plans without also having a plan in place for alternative modes of transportation. It is time we become more progressive in coastal development. This 101 corridor is the only broken link between the very popular hammond trail and the bike route coastal to Eureka. I am positive that a safe pedestrian/bike trail between Arcata and Eureka would become very popular and allow for increased safety to all. It would also mitigate the increase in danger to non-motorists from an increase in highway speeds.

Sincerely,
Russell Kramer

Delaplaine, Mark@Coastal

From: Jessica Frisk <jessyfrisk@gmail.com>
Sent: Thursday, August 15, 2013 8:24 PM
To: Delaplaine, Mark@Coastal
Subject: No to Caltrans 101 Corridor Project without the Bay Trail!

Hello Mark, I am writing you in regards to the Caltrans 101 corridor project. It is unacceptable for Caltrans to turn the 101 Corridor adjacent to Humboldt Bay into a high-speed freeway without safe accommodations for cyclists and pedestrians.

Caltrans' project must provide safe access for bike commuters, touring cyclists, and pedestrians alike, and ensure that such travelers from Eureka, Arcata, Bayside, Indianola, and places in between can access a trail along Humboldt Bay. The section of trail connecting Arcata and Eureka is the region's highest priority for completing the California Coastal Trail. This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.

Additionally, highway 101 is currently at risk of flooding during extreme high tides and major storms. The railroad berm and dikes, which are currently the only protection from high water levels, are eroding – putting the 101 corridor at even greater risk. Sea level rise will only add to these problems. Work on the highway, trail, and rail corridors should all be planned together while taking into account storms, high tides, and projected sea level rise. Caltrans needs to address these issues before any action is taken on the 101 corridor project.

Thank you for your time.
Jessica Frisk
6089 Beechwood Dr.
Eureka, CA 95503

Delaplaine, Mark@Coastal

From: Carla Paliaga <carlapaliaga@yahoo.com>
Sent: Thursday, August 15, 2013 9:27 PM
To: Delaplaine, Mark@Coastal
Subject: CAL TRANS 101 project

Dear Mr. Delaplaine,

I have been living in Arcata for the last 3 years and off of Old Arcata Road at 1420 Old Arcata Road for the last year. I am very concerned about the 101 project. My largest concerns involve the flood plain situation, the increased traffic on Old Arcata Road and the bike lane. I strongly suggest that we get more information before proceeding with this project. I have 2 young children (ages 7 and almost 4.) We often bike and walk along Old Arcata Road to Jacoby Creek Road where their grandparents live. We appreciate the new radar feedback signs and also notice that many drivers continue to speed along Old Arcata Road.

I was wondering the other day as I traveled through Eureka on 101, why there needs to be increased speed along the safety corridor when the speed limit through Eureka is at most 45mph. Also, why not put in lights at the Bayside cutoff and/or continue to keep the lower speed limit?

Thank you for your time,

Carla Paliaga
1420 Old Arcata Rd.
Arcata, CA 95521
707-633-5483

Delaplaine, Mark@Coastal

From: Susanna Weber <susannaweber@yahoo.com>
Sent: Thursday, August 15, 2013 9:46 PM
To: Delaplaine, Mark@Coastal
Subject: Highway 101 Caltrans project

Dear Mr. Delaplaine,

We're concerned about the upcoming decision which will decide the fate of the Highway 101 corridor between Eureka and Arcata. We feel that it's very important to build a trail between these communities, to allow safe travel for pedestrians and bikers, especially in light of the possibility of increased traffic speeds. YES to the Bay Trail!

Thank you,
Susanna and Michael Ausema

Delaplaine, Mark@Coastal

From: Mark S. Wilson <Mark.S.Wilson@humboldt.edu>
Sent: Friday, August 16, 2013 9:54 AM
To: Delaplaine, Mark@Coastal
Subject: Comments on CalTrans 101 Corridor Project

Hello,

I'm concerned about CalTrans current plans for the stretch of 101 between Arcata and Eureka. Their goal is to turn this stretch of currently 50 mph road into a high speed, limited access freeway. While such a plan might make sense for Los Angeles or San Diego, it ignores local realities and will endanger cyclists and pedestrians.

This stretch of road joins two small communities (population of Eureka ~27,000 and Arcata ~17,000). The area and economy are growing much more slowly than the rest of the state; the population of Eureka today is less than what it was 25 years ago. Locally, the CalTrans project is called "The $100 million dollar solution to a problem that doesn't exist". Worse than just wasting money, though, this 'solution' exacerbates a very serious problem that already does exist. That problem is the lack of a safe route for pedestrians and cyclists between the two communities.

There needs to be a Bay Trail component to this project which accommodates the needs of the many pedestrians and cyclists that already use this stretch of 101, as well as the many more that would use it if a safer route was available.

Thank you,

Mark Wilson
1301 M St
Eureka CA 95501

8268960

Ginni Hassrick, LCSW
517 Third St. Ste. 35
Eureka, Ca. 95501
707 444 8797

RECEIVED
AUG 14 2013
CALIFORNIA
COASTAL COMMISSION

Mark Delaplaine
California Coastal Commission

Dear Mark,

I understand that CalTrans is planning to alter the Safety Zone on 101. I have done some research on the traffic patterns here with the assistance of the CHP. I live on Old Arcata Road, between Bayside and Indianola....and have had 5 accidents occur on this stretch of road since I bought my home. Two came through my fence, into my front yard...another nearly killed a young man, running into the barn next door, car flipped...requiring jaws of life...another found a young woman, drunk in the ditch on the road, car went off road, and another was a close call with a bike and car ... a friend's son.

The current design and speed limit on 101 seems to be working. Few accidents occur at the interchanges as they are now designed. If the plan goes forward, the impact on small roads, such as Old Arcata Road would be deadly. As it is, people go 45 on Old Arcata Rd. only 5 miles less than 101...which, in reality, means they drive at least 55 on my road and 55-60 on 101. 101 is monitored by CHP. Old Arcata Rd. is not monitored.

If you restrict access from Bayside to Bay by closing off Indianola...you restrict and cause more driving than simplifying and lessening impact on air quality. If you move into the wetlands, you are taking all of our right to enjoy birding and wetland wildlife away.

We already have problems with higher water levels and they are rising...why create more contructs on 101? why not raze tracks and create trails so bikes and people have choices beyond highway usage?

If something isn't broken...why fix it? What is broken is the attitude of Cal trans towards community needs and planetary design. Less is better. Rails to trails is best.

Don't fill my wetlands...don't impact my home with more traffic...

Ginni Hassrick, LCSW

Ginni Hassrick
3261 Old Arcata Rd

California Coastal Commission
1385 8th Street, Suite 130
Arcata, California 95521
Attention: Mark Delaplaine

15 August 2013

Regarding Cal Trans' Proposal for Highway 101

We are longtime Bayside Residents who feel very protective toward what is left of the Humboldt Bay ecosystem. Many individuals, agencies and a few Land Trusts have given decades of dedication to protecting the ancient stream channels, restoration of native plants and re-creating habitat. A plan that calls for destruction of more than 10 acres of wetland without adequate mitigation is untenable.

The State of California, in its history of human development, has lost a vast amount of healthy regenerative wetland. We have no doubt that this behemoth of a California State agency regards 10 acres as perhaps nothing more than a margin with troublesome stability. We fervently hope in this time of worldwide assault on sustainability that you, the Coastal Commission will use your reasoned power to protect against the irretrievable loss of every single acre left of this ecosystem.

Sincerely,

Chip Dixon
Charlotte Dixon

Chip and Charlotte Dixon
4156 Brookwood Drive
Bayside, California 95524

ccdixon@suddenlink.net

Delaplaine, Mark@Coastal

From: Erin Kelly <erincloverkelly@gmail.com>
Sent: Thursday, August 15, 2013 2:03 PM
To: Delaplaine, Mark@Coastal
Cc: Floyd, Kim R@DOT
Subject: CalTrans 101 corridor project

Hello Mr. Delaplaine and Ms. Floyd,

I'd like to voice my support for a pedestrian and bicycle path to augment proposed changes to the current 101 corridor. I am a professor at Humboldt State University and I have students and colleagues who commute between Eureka and Arcata. The danger they are exposed to is ridiculous and should be very concerning to Caltrans.

As you know, Caltrans rejected the option of building a bicycle/pedestrian path on 101 because of financial concerns and presumably because of wetland fill concerns. In its response to the Coastal Commission recommendations, Caltrans objections to a bicycle/pedestrian path seem 1) disingenuous (reliance on vague ideas for a parallel bicycle path that is not in the planning stages), 2) out of touch (reference to "through trip travel" while basically ignoring commuter travel), and 3) dismissive (noting that there are more cars than bicycles or pedestrians - as if bicycle use wouldn't increase with a bicycle path, or as if the prevalence of cars on the road would somehow negate the importance of bicycle safety). I can blame Caltrans for poor authorship, though I do not know the specific policy constraints on the agency regarding the substance of these concerns. At the very least, I would like to see Caltrans more clearly and honestly deal with the bicycle and pedestrian concerns.

It is most disheartening to me that this opportunity to expand bicycle and pedestrian safety between Eureka and Arcata is being neglected. I strongly support the Coastal Commission objection to the Caltrans proposals. I am signing this as an individual and not as a representative of the university.

Sincerely,

--
Erin Kelly

Assistant Professor | Dept. of Forestry and Wildland Resources
Humboldt State University | 1 Harpst St.
Arcata, CA 95521
office: 707-826-4150
cell: 707-932-1180

August 15, 2013

California Coastal Commission
1385 8th Street, Suite 130
Arcata, CA 95521

Attention: Mr. Mark Delaplaine

I am writing to request that the California Coastal Commission deny the Highway 101 Eureka - Arcata Corridor Project as proposed by CalTrans.

After living along Old Arcata Road in Bayside, California for 39 years, I have repeatedly observed that CalTrans has not dedicated adequate attention to critical details in planning for its projects along Highway 101. My concerns are:

(1) Closing the Bayside Cut-off will restrict access from the Bayside community to the Humboldt Bay, causing all residents living between the Bayside Post Office and the Rocky Creek area to drive several extra miles to access the Bay and any Bay trail.

(2) Traffic from 101 will shift over to Old Arcata Road, with more cars driving faster through our residential community with three elementary schools and no mitigation proposed.

(3) The project will fill more than 10 acres of wetlands without adequate mitigation. CalTrans' traffic volume studies from several years ago have proven to be inaccurate; there are less vehicles than they had projected and it is reasonable to anticipate fewer vehicles in the future. The significant negative environmental impacts of this project are not a reasonable trade-off for the anticipated amount of traffic.

(4) We have observed increased flooding every winter. CalTrans is conducting a sea level rise study that has not been completed. With sea level rise, it will be necessary for a CalTrans firm commitment to ongoing maintenance of a trail built along the Bay.

It's time for CalTrans to go back to the drawing board, complete and update its studies and work much more closely with the community for the best project.

Sincerely,

Margaret A Gainer

Margaret A. Gainer
2290 Graham Road
Bayside, California 95524

Delaplaine, Mark@Coastal

From: Krista Miller <mskristamath@gmail.com>
Sent: Thursday, August 15, 2013 3:57 PM
To: Delaplaine, Mark@Coastal

To Whom it May Concern,
I would like to enter my public comment on the CalTrans 101 corridor improvement project. I am a second generation Humboldt county resident. I bought my home here and struggle to stay employed here. I live here because it is a unique, natural, and diverse coastal environment. I ride my bicycle everywhere and frequently commute to Arcata where my father and mother live. Currently the "safest" route from Eureka to Arcata is on the 101 corridor because it has the largest and most consistent shoulder/bike lane. The pedestrian fatalty statistics show this to be true as well. I am asking the Coastal Commission to halt CalTrans 101 corridor improvement project until a safe bay trail for pedestrian/bicycle commuters/tourists/children, etc is included in the plans. California transportation includes all modes of transportation not just vehicles and that is a real diverse investment for the future. Diversity means survival. Please take a stand for trails. Thank you.

--
Krista Miller

Delaplaine, Mark@Coastal

From: Stacy Becker <sbecker@reninet.com>
Sent: Thursday, August 15, 2013 6:33 PM
To: Delaplaine, Mark@Coastal
Subject: No to Caltrans 101 Corridor Project without Bay Trail

Dear Mr. Delaplaine,

Please support the building of the Bay Trail- settle for no less than this with Caltrans. This area needs a safe passage for non-motorized vehicle travelers between two of our major cities (and beyond). Thank you for helping make the right environmental, economic and social decisions.

Stacy Becker
2364 Hewitt Rd.
McKinleyville, CA 95519

Delaplaine, Mark@Coastal

From: David Beard <majipoorsbeard@gmail.com>
Sent: Thursday, August 15, 2013 6:58 PM
To: Delaplaine, Mark@Coastal
Subject: CalTrans and 101 corridor between Eureka and Arcada

Sir,
It may be indeed be desirable to finish this stretch of freeway. I feel it is a bit irresponsible to disregard the need for a connector trail and the protection that it's development would add to deal with future sea level rise. This is already a tsunami danger zone indicating it is potential inundation zone. The future of a the existing rail infrastructure is also endangered from this lack of prevention. Trail development in conjunction with the highway improvement should shore up that infrastructure. What good will it do to have a high speed road corridor that is submerged? On one hand is economic concerns and on the other recreational health concerns. Why not both?
David Beard
Humboldt County

Delaplaine, Mark@Coastal

From: jeff foley <jefffoley10@hotmail.com>
Sent: Thursday, August 15, 2013 7:27 PM
To: Delaplaine, Mark@Coastal
Subject: 101 corridor project

No project without the Bay Trail! This part of 101 is also designated as the Pacific Coast Bike Route. Caltrans should not be allowed to move forward until they agree to provide a safe route for cyclists and pedestrians by incorporating the Humboldt Bay Trail as part of the project.

Michael V. Hoes
1961 Locke Street
Manila CA 95521

RECEIVED
AUG 28 2013
CALIFORNIA
COASTAL COMMISSION

August 26, 2013

Attention:
California Coastal Commission, c/o Mark Delaplaine, 45 Fremont St., Suite 2000, San Francisco, CA 94105.

It has come to my attention that the California Costal Commission will be holding a meeting in Eureka during the month of September, 2013 to discuss and perhaps come to conclusions regarding changes planned for Highway 101. Apparently the changes under discussion will be; an interchange at Indianola Road, the closure of Bayside Cutoff, and a traffic light at Airport Road, plus the closure of all other median crossing places. It is my understanding that construction of the project would take approximately 3 years. I have several concerns listed as follows:

1. While under construction I believe more drivers will choose Hwy 255 to travel between Arcata and Eureka due to delays etc. during the construction. That is, they will find the Hwy 255 route faster and more convenient due to the inevitable construction delays. We in Manila already feel the effects of the Hwy 101 speed limit and our traffic has increased due to this. We find it a danger to Manila citizens whose community is already cut in half by Hwy 255 becoming a safety hazard for our children, dogs, and of course ourselves.
2. I see no provision for a "Bike and Walking" trail between Arcata and Eureka. This is hard to understand as much interest has been expressed for such a trail both in the interest in finding alternative means of transportation plus the obvious need for healthy ways to pursue our lives such as using bicycles, walking, etc. Due to the obvious interest, "rails to trails, etc.", not planning for such a trail must be an oversight. It is difficult for me to believe that such a trail would not be included in this major overhaul of Hwy 101 between Eureka and Arcata.
3. Having friends and family who live "off of" Old Arcata Road I am also concerned about the increased traffic which they will need to endure during construction and due to the lack of the Bayside Cutoff road.

I have lives in Humboldt County for 45 years and have seen the traffic increase as population pressure increases. I have had several friends killed on Hwy 101 due to the problems that it presents with uncontrolled crossings etc. I am sympathetic to the fact the changes need to be made. I am concerned that we will be missing an opportunity for a really "great" improvement if we do not consider all of these factors.

Sincerely,
Michael V. Hoes (a 25 year Manila resident)

Delaplaine, Mark@Coastal

From: TM <moss6@sbcglobal.net>
Sent: Sunday, August 25, 2013 6:51 AM
To: Delaplaine, Mark@Coastal
Subject: Bayside cutoff

Dear Coastal Commision,
I am writing urging you to keep the Bayside cutoff open. As a resident of Bayside, I feel this closure would adversely affect our community.

There are many issues that Bayside residents have repeatedly raised about the CalTrans plan for 101 over the past ten years. The primary issues are:
(1) Closing the Bayside Cut-off will restrict access from the Bayside community to the Humboldt Bay and to Eureka, causing everyone living between the Post Office and the Rocky Creek area to drive several extra miles to get to Eureka.
(2) Traffic from 101 will shift over to Old Arcata Road, with more cars driving faster through our residential community with three elementary schools and no mitigation proposed.
(3) The project will fill more than 10 acres of wetlands without adequate mitigation.
Thank you for your consideration.
Sincerely, Tara Moss

Appendix M State Historic Preservation Office Letter

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

November 29, 2006

Reply To: FHWA061012A

Rod Parsons, Chief
North Region Environmental Management Branch E1
Department of Transportation
District 1
PO Box 3700
Eureka, CA 95502-3700

Re: Determinations of Eligibility for the Proposed Eureka-Arcata Corridor Projects in Humboldt County, CA

Dear Mr. Parsons:

Thank you for consulting with me about the subject undertaking in accordance with the *Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA).

Caltrans is requesting my concurrence, pursuant to Stipulation VIII.C.5 of the PA, in its determination that the following properties are not eligible for the National Register of Historic Places (NRHP):

- 2846 Jacobs Avenue
- 3008 Jacobs Avenue
- 3130 Jacobs Avenue
- 3134 Jacobs Avenue
- 3346 & 3348 Jacobs Avenue
- 3324 & 3360 Jacobs Avenue
- 3408 Jacobs Avenue
- 3428 Jacobs Avenue
- 3824 Jacobs Avenue
- 3956 Jacobs Avenue
- 6700 N Highway 101
- 4056 N Highway 101
- Tidegates and ditch
- Eucalyptus Trees
- Portions of Flanigan, Brosnan & Company Railroad
- Portions of Freshwater Railroad
- Portions of the Northwestern Pacific Railroad

I concur.

I am presently unable to concur that a portion of the Murray Field Airport, a former World War II Naval Air Station in the undertaking's APE, is eligible for inclusion in the NRHP under criterion C at a local level of significance. I currently do not have sufficient contextual information to make an eligibility determination for this property. I would prefer to suspend consideration of the subject property's NRHP eligibility until such time as a more complete context for the history of the airport and air hangars, as a whole, becomes available. For the purpose of our present consultation, I recommend, in the absence of the availability of such a context, that the FHWA assume the National Register eligibility of the Murray Field Airport.

A portion of the Batini Dump, a refuse dump that dates to the 1930s, is located within the area of direct impact (ADI) for the project. This portion was evaluated as not eligible for the NRHP. The remaining known portion of the dump is located to the east on private property outside of the ADI. Pursuant to Stipulation VIII.C.3. of the PA, Caltrans is considering this portion of the Batini Dump eligible for the NRHP under criterion D for the purposes of the present undertaking without conducting further subsurface testing or surface collection. An environmentally sensitive area will be established and enforced to ensure that there will be no adverse effects to this property as a result of the proposed undertaking pursuant to Stipulation X.B.2.a(ii). **I concur.**

Thank you for considering historic properties as part of your project planning. If you have any questions, please contact Natalie Lindquist of my staff at your earliest convenience at (916) 654-0631 or e-mail at nlindquist@parks.ca.gov .

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

Appendix N Humboldt Bay Area Mitigation Concept Design Report

Humboldt Bay Area Mitigation Concept Design Report

EA: 01-0E000

EFIS ID# 01-1300000091

December 2015

Humboldt Bay Area Mitigation Concept Design Report

Humboldt County, California

EA: 01-0E000

EFIS ID# 01-1300-0091

December 2015

STATE OF CALIFORNIA

Department of Transportation

Prepared By: _____ Date: 12/14/15

Kelley Garrett, Mitigation Specialist
(707) 441-2032
Caltrans District 1
1656 Union Street
Eureka, CA 95501

Approved By: Carolyn Brown Date: 12-14-15

Carolyn Brown, Branch Chief
North Region Environmental Stewardship
(530) 741-4133
Caltrans District 3
703 B Street
Marysville, CA 95901

Summary

The California Department of Transportation has developed the Humboldt Bay Area Mitigation Project (HBAM) to address the compensatory wetland mitigation needs of the Eureka-Arcata Route 101 Improvement Project. HBAM will also generate mitigation credits additional to those required for the Eureka-Arcata Route 101 Improvement. Excess credits will be used to deliver locally-funded trail projects (with wetland mitigation needs) within the Humboldt Bay area, and to provide advance mitigation credits[1] for future transportation project-related wetland impacts within the watershed. Similar in approach to that of a mitigation bank, HBAM will avoid the pitfalls of "postage stamp" mitigation, by improving on the more typical individual and piecemeal approach to mitigating wetland loss. HBAM affords an opportunity to restore ecosystem functions over large areas as opposed to small and isolated wetland sites.

Caltrans made use of a watershed approach in developing mitigation, under the guidelines of United States Army Corps of Engineers mitigation regulation 33 Code of Federal Regulations (CFR) parts 332 and 325, aka "the Mitigation Rule." The HBAM watershed approach is informed by historical ecology and framed within today's human-built environment to provide improved quality of wetland functions across a range of current and future conditions. Under this approach Caltrans proposes that the ecological need for the watershed is for restoration of wetland functions lost to agricultural development. Utilizing strategically located parcels, HBAM proposes the restoration of wetland function to serve the watershed need in locations that provide additive function to neighboring publically-managed natural resource properties. HBAM will add substantial acreage of suburban wild land.

HBAM will be permitted as a stand-alone project, separate from the Eureka-Arcata Route101 Improvement. In preparation of future permit submittal, this concept design report has been prepared to guide requisite environmental studies and analysis.

A final project document that includes all mandatory requirements of a compensatory mitigation plan, as per the Mitigation Rule, as well as a proposal for tracking any advance credits and their use, will be prepared for regulatory agency review and approval at the time of HBAM permit submittal. This concept design report consists of two parts; Part 1 provides general HBAM planning information (background), while Part II provides planning specifics (site conditions, restoration design, and proposed improvements to wetland function for the HBAM Samoa and Lanphere parcels, respectively).

Cover photos: Top, Lanphere Parcel—illustrating conversion of tidelands and forested/scrub wetland to agriculturally-managed wetland; Bottom, south Humboldt Bay—illustrating the natural continuum of native habitats—tidal marsh to forested/scrub wetland to coniferous forest (photo courtesy Greg Nyquist).

[1] Advance mitigation credit is created by establishing compensatory mitigation in advance of actual project impact to jurisdictional resource(s).

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List of Abbreviated Terms

Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CFR	Code of Federal Regulations
HBAM	Humboldt Bay Area Mitigation
HUC	Hydrologic Unit Code
MRS	Mad River Slough
MTL	mean tide level
NAVD88	North American Vertical Datum of 1988
QMS	Quality Management System
SLR	sea level rise
SPD	South Pacific Division
SR	State Route
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey

Part I—Project Background

OBJECTIVES

The purpose and need of the Humboldt Bay Area Mitigation Project (HBAM) is to assist in delivery of the California Department of Transportation (Caltrans) Eureka-Arcata Route101 Improvement Project and other public transportation projects located within the same watershed, through development of compensatory wetland mitigation. HBAM and the Eureka-Arcata Route 101 are located in Humboldt County, within the Humboldt Bay area of California and within the watershed defined by the United States Geologic Survey (USGS) 8-digit hydrologic unit code (HUC) 10810105 (Mad-Redwood). See maps 1 and 2, Project Vicinity and Watershed Map.

The Eureka-Arcata Route 101 Improvement Project will permanently fill 8.11 acres of wetland and waters subject to permit under the Clean Water Act (United States Army Corps of Engineers jurisdiction), and an additional 2 acres of one-parameter coastal wetland (subject to permit under the California Coastal Act). Of the 10.2 acres to be filled, 10.1 acre is former tideland that was prior-converted to low-functioning Palustrine Emergent wetland, which is maintained in a mowed condition along a highway, and is dominated by non-natives (e.g. sweet vernal grass (*Anthoxanthum odoratum*) and tall fescue (*Festuca arundinacea*).[2] Based upon impact site wetland condition at the Eureka-Arcata Route 101 Improvement Project—either freshwater, or tidal, wetland mitigation would constitute appropriate mitigation (in-kind) for the 10.1 acre wetland impact.

HBAM proposes use of three parcels, totaling over 150 acres. The parcels are referred to as the Samoa Parcels (two) and the Lanphere Parcel, and they are located west of the City of Arcata, Humboldt County, California. See Map 3, Project Location.

HBAM proposes the rehabilitation/enhancement of approximately 80 acres of Palustrine Forested/Palustrine Scrub-shrub wetland at the Samoa Parcels.[3, 4] At the 78-acre Lanphere Parcel, HBAM proposes the reestablishment of approximately 30 acres of Estuarine Intertidal Emergent and Unconsolidated Shore (mudflat) including tidal channels—under a full or muted tidal alternative (as well as 6 acres of forested wetland expansion and upland buffer restoration). Alternatively, at the Lanphere Parcel, a non-tidal project alternative proposes approximately 40 acres of Palustrine Forested/Palustrine Scrub-shrub wetland restoration and enhancement.

---

[2] Information specific to the Eureka-Arcata Route 101 affected wetland environment can be found in Appendix B.

[3] Wetland classifications per Cowardin et al., 1979.

[4] Two of the 80 acres has already been constructed as forested/scrub wetland restoration (and is discussed in Part II, Samoa Parcels, Existing Site Conditions).

WATERSHED APPROACH

Under the Mitigation Rule, compensatory mitigation must identify the manner in which resource functions of the proposed mitigation will address the needs of the watershed (CFR 332.3(b)(2)(i)). However, there are no available watershed plans for the Humboldt Bay region addressing overall current wetland status. Therefore, in an effort to assess the watershed's wetland needs—Caltrans has performed extensive research into the area's historical wetland ecology. The HBAM watershed approach to wetland mitigation considers not only past (historical) information, but also the current condition under a human-built environment, and possible future condition under climate change.

Historical Ecology

Humboldt Bay is the second largest estuary in California and it adjoins a coastal plain that transitions into the world-renowned belt of coastal redwood forest (*Sequoia sempervirens*) (HBHRCD, 2007). In contrast with the national trend of greater than 50% loss of the historic wetland acreage since the time of European settlement (Dahl, et al. 1997)—the Humboldt Bay area has experienced a *negligible* loss of actual wetland acreage (HBHRCD, 2007). Instead, development actions are responsible for a near total conversion of historic wetland habitats Estuarine Intertidal Emergent and Palustrine Forested/Palustrine Scrub-shrub (i.e. tidal marsh and forested/scrub wetland)—to agriculturally-managed Palustrine Emergent wetland, primarily non-native pasture grasses—providing minimal wetland function or service (Carson, 2014 and USU, 2015).

Locally, salt marsh habitat has been reduced by 85-90% (Barnhart et al., 1992). This overwhelming, and ecologically tragic loss of tidal marsh within the Humboldt Bay area has been widely acknowledged. However, what has been long-overlooked is the elimination of forested/scrub wetland from the landscape and the ecological implications of this loss.[5]

Soil maps prepared in 1921 for the Humboldt Bay area describe soil types and their associated native vegetation (Watson et al., 1925). Across the coastal plain, between the tidally-derived Coqueville (soil) series and the upland forest of the Empire loam (soil) series—the Bayside Loam, Ferndale Silt Loam and Ferndale Fine Sandy Loam series supported a forested wetland and marsh mosaic composed of willow (*Salix* spp.), alder (*Alnus rubra*) and Sitka spruce (*Picea sitchensis*), interspersed with areas of grasses/sedges and riparian shrubs. Coastal redwoods were also described as included—they would have dotted the habitat in drier locations (Watson et al., 1925). The North Bay portion of the coastal plain contained more than 50% of all the historic forested/scrub wetland of the Humboldt Bay area. See Map 4, 1921 Soils Map.

[5] The forested/scrub wetland of the Humboldt Bay area has been variously referred to as riparian wetland, riparian woodland, riparian swamp, forested wetland and willow swamp.

Figures 1 and 2. Within the Humboldt Bay area, the overwhelming majority of tidal marsh and forested/scrub wetlands (top) have been converted to agriculturally-managed wetland (bottom).

The North Bay coastal plain (a.k.a. the Arcata Bottoms) was included in the territory of the Wiyot People. According to Christopher S. Haynes (1986, Humboldt State University) prior to European contact—the landscape of the Arcata Bottoms was likely a maze of sloughs, oxbow ponds and marshes, with a dense vegetative cover of berries, alders, willow and stands of spruce and fir. The floodplain (with its thick alluvial layer courtesy of Mad River) supported a rich and diverse plant assemblage that included large areas of marsh, prairie and riparian woodland. To cultivate food plants, the Wiyot practiced burning of the coastal prairie, providing grazing opportunity for elk and deer. See Map 5, Wiyot Landscape of the Arcata Bottoms.

The first European settlers described the Arcata Bottoms between Arcata and the Mad River as "At the time (1854) the land was in a wild state" which included massive spruce trees (forty-five foot circumference) within the landscape; and, the area was "all brush, timber and marshland, since reclaimed and now a rich bottomland" (Haynes, 1986). Failing to recognize Wiyot ownership, in 1850 the Arcata Bottoms fell under federal and State government control and were divided and sold under the requirement that the lands be settled on, *and improved for agriculture* (Haynes, 1986).[6]

Reference to this historic loss of forested/scrub wetland—due to agricultural development—can be found in a 1973 report by the California Department of Fish and Game,[7] *The Natural Resources of Humboldt Bay*: "Prior to the (European) settlement of Humboldt Bay, woodland habitat covered most of the hillsides and plains down to the edges of the marshlands… At present, remnants of the original woodland stands are found only in small isolated groves." (Monroe, 1973). The report differentiates between upland woodland and riparian woodland—describing riparian woodland as typified by "willow, alder, black cottonwood, blackberry, salmonberry…" that would have present along streams, sloughs and poor-draining lowlands (i.e. the coastal plain).

In performing research, Caltrans estimates that echoing the loss of tidal marsh—*at least 90%* of the Humboldt Bay forested/scrub wetland *has also been eliminated* due to agricultural development.[8] Once encompassing over 14,000 acres across the coastal plains of Humboldt Bay; today perhaps as few as 1,300 acres of forested/scrub wetland exist in isolated patches.[9, 10] While upwards of 90% of all wetland acreage was converted for agricultural use—under this management regime it does continue to delineate as wetland, yet it does so with greatly diminished wetland function and service. See maps 4 and 6, 1921 Soil Map and Current Aerial.

Historically, the Mad-Redwood watershed was characterized by river and stream courses twined through the coniferous forest, to outlet on the coastal plain—by wending their way through the forested/scrub wetland, and then the tidal marshes of Humboldt Bay. Today, little of this ecological continuum remains intact.

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[6] The United Indian Health Services Potowat Health Village website describes that the health center was built on former dairy and ranch lands in the Arcata Bottoms, and notes the area had once been a low-lying wetland "dotted with stands of willow, salmonberry, alder, spruce thickets and brush." (UIHS, 2014).

[7] Now known as the California Department of Fish and Wildlife.

[8] Glenn Hurlburt, California Department of Transportation hydrologist, overlaid the 1921 USDA Soil Map of the Eureka Area (Watson et al., 1921) on a NAIP 2013 map layer to estimate acres of forested/scrub wetland (i.e. areas of Bayside Loam series, Ferndale Silt Loam series and Ferndale Fine Sandy Loam soil series).

[9] The author has estimated approximately 1,300 acres of extant riparian swamp vegetation from review of Google Earth © 2013 images.

[10] This finding is consistent with wetland trends for both California and the Pacific Northwest. In the Sacramento River Valley prior to European settlement—riparian forests were the predominant floodplain vegetation; less than four percent remain (Hunter et al., 1999). In the Pacific Northwest, Palustrine Forested/Scrub-shrub (freshwater) Tidal Swamp was once prevalent throughout the upper estuaries of the Columbia River basin but was converted for agricultural use; now less than 25% remains (USFWS, 2015).

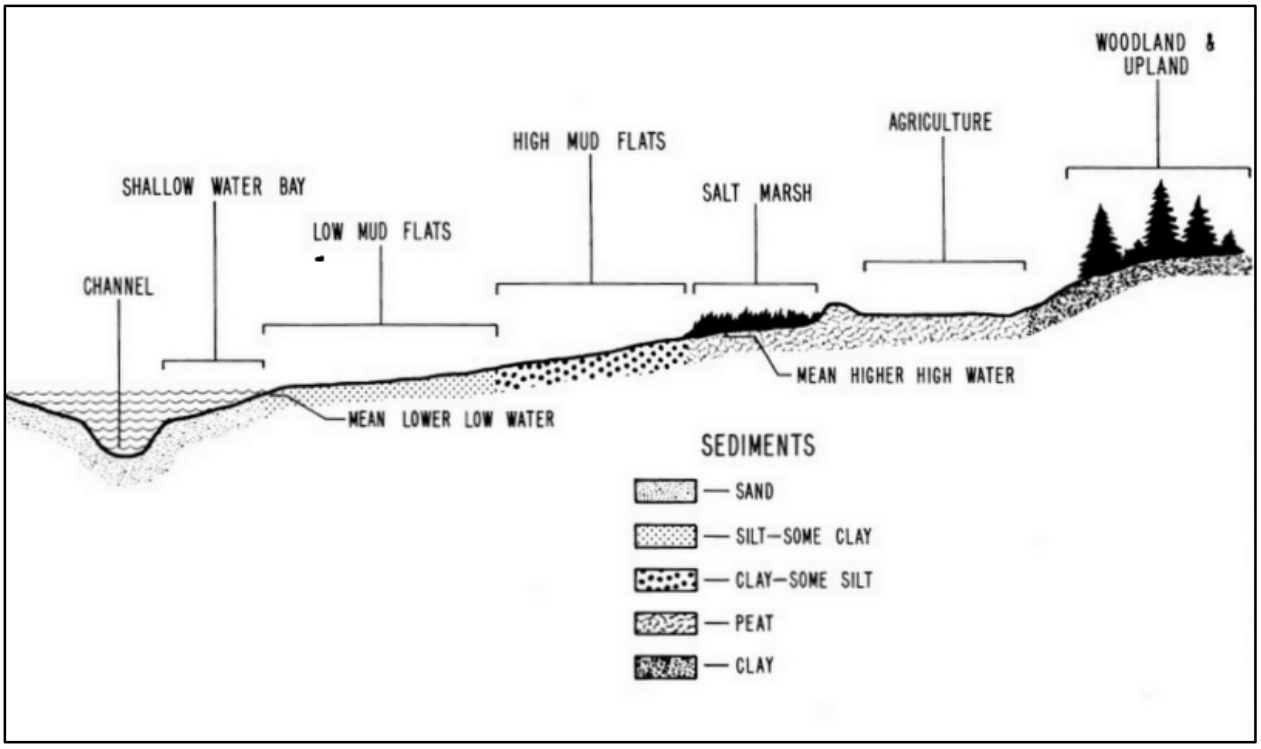

Exhibit 1. Illustrating the agricultural disturbance to the ecological continuum of the Humboldt Bay Coastal Plain (Monroe, 1973, Humboldt Bay Profile Map).

Humboldt Bay area forested/scrub wetlands (now primarily converted to agriculturally-managed wetlands) are slope wetlands with hydrology supplied by upland runoff, high annual precipitation and associated high water table. They can be described at the landscape level as riparian wetland, with the aquatic feature being the bay itself (and its tributary rivers and streams).[11] Riparian areas have been defined as the transitional area between terrestrial and aquatic ecosystems—providing linkage between water bodies and adjacent uplands—and including portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (CRHJV, 2009). Riparian ecosystems (which can be said to include forested/scrub wetlands) are connected to aquatic ecosystems by direct fluxes, as well as below-ground through the hyporheic zone.[12] The forested/scrub wetland of the Humboldt Bay coastal plain (a tree, shrub, marsh and meadow mosaic) provided the ecologic link between tidal marsh and upland coniferous forest. This linkage is now largely absent from the landscape. See Exhibit 1, above.

[11] The State Water Resources Control Board working definition for riparian areas is: "…areas through which surface and subsurface hydrology interconnect aquatic areas, and connect them with adjacent upland… They can include wetlands…that influence the condition of aquatic areas." (SWRCB, 2012).

[12] The hyporheic zone is a below-ground region where bi-directional flows of organism and materials between groundwater and surface water are common (NRC, 2000).

By linking aquatic and terrestrial ecosystems, riparian areas make each more ecologically diverse and productive (Norris, 2001). A dynamic interdependence exists between terrestrial and aquatic food webs, thus forested/scrub wetland located upslope of tidal marsh is not only valuable habitat in its own right, but also provides for *enhanced* tidal marsh by means of cross-habitat exchanges (i.e. food webs and ecologic subsidies—or the flux of material from one habitat or ecosystem to another (Nakano et al., 2001)).

Due to the connection of riparian habitat (along streams/rivers) to downslope aquatic features much of the high riparian productivity is exported to habitats downstream (HBHRCD, 2007). The forested/scrub wetlands of the coastal plain can be anticipated to perform in this same manner, exporting production downstream to benthic and tidal habitats. Riparian habitat provides for water quality improvements to the downstream environments and maintenance of water quality—through biological processing of pollutants and physical filtering of sediments and organic debris, reduced flow velocities, reduced stormwater turbidity, entrapment of large debris, and increased infiltration rates (CRHJV, 2009). Humboldt Bay forested/scrub wetland can be anticipated to provide similar water quality improvements.

The heterogeneity (i.e. high degree of horizontal interspersion and habitat mosaic) of riparian forests in California (e.g. forested/scrub wetland), supports a greater diversity of wildlife than any other habitat type (Smith, 1980). The extensive three-dimensional structure and abundant moisture of riparian habitats are responsible for the well-documented high biological productivity of these areas (HBHRCD, 2007).

Similar to existing Pacific Northwest Palustrine forested/Palustrine scrub-shrub wetland within the Colombia River estuary—the forested/scrub wetlands of Humboldt Bay are likely to have provided nutrients for the estuarine food chain through an abundance of dead trees, shrubs, leaves and branches that would have fed detritivores—which in turn, would have fed juvenile salmonids and other fish. When flooded forested/scrub wetlands would have provided off-channel, off-estuary habitat—affording floodplain rearing for salmonids (USFWS, 2014). Today, surviving fragments (and restored areas) of forested wetland and riparian habitat continue to feed and shelter listed salmonids in the Humboldt Bay area.[13]

Large amounts of woody debris, standing and fallen, would have been present within forested/scrub wetlands, providing habitat complexity for cavity and crevice dwelling species. Historically, forested/scrub wetlands of the Humboldt Bay area provided a mosaic of such habitat complexity that even the grizzly bear (*Ursus arctos horribilis*) is reported to have made use of it (Haynes, 1986, and UIHS, 2014). However, large animals historically noted as present (elk, bear) have long been extirpated, and the vast conversion of historic wetland habitat is also likely to have dramatically affected the numbers and diversity of smaller animals.

[13] The restoration of estuarine marshes and associated floodplains (e.g. Humboldt Bay forested/scrub wetland) can positively influence the recovery of listed salmonids by increasing juvenile-to-smolt survival rates (Moyle et al., 2008).

Forested/scrub wetlands exhibit a multi-layered canopy structure (comprised of an array of native plant species) providing primary biological function that supports nesting, rearing, foraging and hiding habitats for numerous avian, amphibian, and mammalian species; the variegated structure of this habitat allows for a multitude of niches inhabited by a myriad of wildlife.

Dr. C.J. Ralph, of the Humboldt Bay Bird Observatory, has estimated that upwards of sixty (60) native bird species can be anticipated to benefit from restored forested/scrub wetland in the area. Species to benefit include Allen's hummingbird and wrentit, both of which are watch-listed in the *State of the Birds 2014 Report*, due to high vulnerability ranking in the United States (NABCI, 2014), as well as seven of the 17 focal species identified in the *Riparian Bird Conservation Plan* for targeted conservation in California (CRHJV, 2004). See Appendix C.

Human-Built Environment

The human-dominated, human-built environment of the coastal plain, which includes a widespread presence of non-native forage species—can make return to historic or "pristine" condition unrealistic, and can create restoration complexities requiring strategic design to provide reconciliation ecology.[14] Reconciliation ecology seeks to reverse trends of decreasing biodiversity in human-dominated landscapes, rather than striving to restore pristine landscapes.

As a result of tidal de-watering, former tidelands have compacted by as much as three feet in elevation due to oxidation of soil organics (Laird, 2014). Simply breaching existing levees without an addition of fill material, would result in a flooded aquatic feature rather than the restoration of tidal marsh. Appropriate fill material necessary to restore proper elevations to support salt marsh development is in high demand, and locally limited in supply. Prioritization of tidal restoration sites is required. At the HBAM Lanphere Parcel, and other former tidal locations around the bay, the desire to protect neighboring private properties from salt water intrusion presents an additional design constraint, requiring additional fill material for construction of setback levees.

In few and precious places on former tidelands, ecologically significant forested/scrub wetland has taken hold—where agriculture has been light or absent and management has precluded cutting and clearing (e.g. the Lanphere Parcel).[15] Additionally, on some former tidelands (e.g. downslope from the Samoa Parcels), freshwater ponds have been purposely constructed to supply habitat for migratory waterfowl. In circumstances such as these, on former tidelands where freshwater wetland values are high—the best conservation decision may be to maintain a freshwater hydrologic regime.

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[14] Per ecologist Michael Rosenzweig, reconciliation ecology is "the science of inventing, establishing and maintaining new habitats to conserve species diversity in places where we live work and play." Source available on-line at: http://californiawaterblog.com/2014/07/23/reconciling-ecosystem-and-economy/

[15] Due to a contraction of habitable area in excess of 90% across the Humboldt Bay coastal plain—the forested/scrub wetland at Lanphere has become an "ark" for migratory nesting songbirds, providing ecologically significant habitat. The forested/scrub wetland at Lanphere supports some of the best migratory nesting songbird habitat in the state, per Dr. CJ Ralph of the Humboldt Bay Bird Observatory (Ralph, 2010).

Exhibit 2. Remnant Forested/scrub Wetland of the Humboldt Bay Area.

Clockwise from top left: north bay at Lanphere Parcel (from Lanphere Rd.) facing north into riparian corridor; north bay at Lanphere Parcel facing east into riparian corridor; mid bay just south of Sequoia Humane, facing east; mid bay at Ishikari Trail, facing east. At bottom left, south bay at Hookton Rd, facing north to Humboldt Bay National Wildlife Refuge; at bottom right, south bay at Hookton Rd, facing southeast.

Changing Conditions

For the Humboldt Bay area, the most critical impact of climate change is likely to be sea level rise (SLR), while near extirpation of native wetland habitats leaves the ecosystem particularly vulnerable. HBAM made use of climate-smart strategies (Stein et al., 2014) in mitigation design; HBAM strategies will provide wetland benefits under a range of current, as well as future conditions.

A 2009 journal article prepared by Point Blue Conservation Science advocates that riparian restoration (e.g. forested/scrub wetland) can prepare ecosystems for climate change by reducing the vulnerability of natural systems. Restoring riparian areas (and resource function) re-establishes connectivity between habitats and elevations—providing corridors for species dispersal/migration requisite under effects of climate change. Many riparian plants are adapted to hydrologic and geomorphic disturbances, tolerating seasonal and annual variation in environmental conditions, therefore riparian areas may be more resilient to changing conditions (higher intensity/increased storm events and prolonged drought) compared to upland species. Restoration of riparian habitat promotes redundancy and repairs/strengthens linkages between aquatic and terrestrial zones, thereby increasing the resiliency of both under effects and stresses of climate change (Seavy et al., 2009). HBAM proposes to restore and enhance forested/scrub wetland, promoting ecosystem resiliency—providing an expansion of habitat, enhancing connectivity (and species movement), and creating species refugia.

Salt marshes are carbon sinks that can slow rates of climate change caused by greenhouse gas. Salt marsh plants pull atmospheric carbon (carbon dioxide) storing it in roots and eventually soil, as roots decompose (NOAA, 2015). HBAM proposes to restore tidal marsh, providing for carbon sequestration and storage—as well as providing for an expansion of habitat for native plants and animals, including rare and listed species. Meanwhile mudflat (Estuarine Intertidal Unconsolidated Shore) provides the best potential to buffer increases in SLR, because as sediment accretes—vegetated tidal and subtidal habitats form (Appendix A, AECOM, 2015). HBAM proposes to restore mudflat, thereby buffering SLR while also providing high quality habitat for invertebrates, zooplankton, algae, mollusks and annelids—an essential food source for a variety of shorebirds.

Watershed Need

In the Humboldt Bay area, whereas a negligible amount of the historic wetland acreage has been lost to fill—the ecological effects of land use, primarily agricultural development, have resulted in 85-90% of the historic wetland acreage (both Estuarine Intertidal Emergent and Palustrine Forested/Palustrine Scrub-shrub wetland) experiencing major degradation to wetland function and service. The use of a watershed approach which is informed by past, present and possible future conditions demonstrates that for the Humboldt Bay area (and the Mad-Redwood watershed) rather than establishment, or re-establishment of wetland acreage—the *ecological need* is for restoration of *wetland functions* lost to agricultural development—specifically resource functions associated with tidal and forested/scrub wetland, thereby providing wetland functions whose scarcity within the watershed cannot be overstated.

SITE SELECTION/SITE PROTECTION

HBAM parcels were sited such as to be "gateway" properties, providing substantial wild land value. The Samoa Parcels are located adjacent to the California Department of Fish and Wildlife (CDFW) Mad River Slough Wildlife Area and the City of Arcata's Marsh and Wildlife Sanctuary—and at the foot of Jane's Creek/McDaniel Slough, a perennial stream with its headwaters located in the Arcata Community Forest and (see maps 3 and 7.) The Lanphere Parcel is situated between the Mad River Slough and the United States Fish and Wildlife Service (USFWS) Humboldt Bay National Wildlife Refuge's Lanphere and Ma-le'l Dunes Units (see map 3 and 8).

HBAM parcels were selected based on the following criteria:

- Site location within same watershed as impact site;
- Site condition is likely to support substantial ecological lift in wetland function; site is capable of maintaining and improving the quality/quantity of aquatic resources within the watershed;
- Mitigation action at site will expand upon and/or is adjacent to other regional large-scale conservation efforts, and
- Resource function to be provided at site would be in-kind, or of greater value than impacted resource.

Once mitigation actions have been constructed, a conservation easement (or comparable restriction) will be placed upon the HBAM parcels to protect wetland resource values. The USFWS is in favor of undertaking the perpetuity management of the Lanphere parcel. Caltrans will retain responsibility for managing the Samoa Parcels until such time as a qualified and appropriate third party can be determined.

ESTIMATED IMPLEMENTATION COSTS

The HBAM parcels have been previously acquired by Caltrans at a cost of approximately $1.1 million. The purchased properties include a fourth parcel of approximately 20 acres at the west end of Old Samoa Rd., which is likely to be disposed of as excess property. Existing structures located on the east side of the Samoa Parcels (barn, house and outbuildings), along V Street are not currently considered as a part of the HBAM project.

Estimated project costs to implement construction (including short-term maintenance) at the Samoa Parcels is approximately $3.1 million. (See Appendix E.) Estimated project costs to implement construction (including short-term maintenance) at the Lanphere Parcel varies dependent upon alternative selected—$2.45 million for the non-tidal freshwater (forested/marsh mosaic) alternative, $3.78 million for the muted tidal alternative, and $4.68 million for the full-tidal (low-fill option) alternative. (See Appendix A, Chapter 5.)

Estimated project costs do not include mitigation performance monitoring or long-term management costs; these costs will be estimated and vetted for inclusion in the HBAM Mitigation and Monitoring Plan submitted for Agency review at the time of project permitting.

DETERMINATION OF CREDITS

Caltrans has estimated the amount of credits to be generated by HBAM using the USACE South Pacific Division (SPD) regional compensatory mitigation and monitoring guidelines (SPD USACE, 2015), and the SPD's Quality Management System (QMS) document 12501.6, an Excel worksheet used to calculate required compensatory mitigation ratios. Caltrans also made use of QMS documents 12501.2, 12501.3 and 12501.5, the SPD's worksheet instructions, worksheet examples and worksheet training presentation, respectively.[16]

QMS Document 12501.6 makes use of a qualitative, or quantitative, functional analysis to determine the functional lift of proposed mitigation in comparison to the resource impact site. Estimation of credits was performed by comparing wetland function of the to-be-affected, prior-converted, Palustrine Emergent wetland at the Eureka-Arcata Route 101 impact site to the HBAM proposed restoration (mitigation) actions. Estimation efforts included an assumption of HBAM construction concurrent to wetland impact. See attached worksheet, Appendix D.

While the QMS Document 12501.6 was devised to calculate mitigation ratios, the end math can be "flipped" to provide a mitigation credit ratio. For example, proposed forested/scrub wetland rehabilitation and enhancement can be estimated to provide a credit of ratio of 0.59:1, or 0.59 acre-credit for each rehabilitated/enhanced acre (see Column A, final ratio of Appendix D). Therefore, HBAM's proposed 83 acres[17] of forested/scrub wetland rehabilitation and enhancement could provide approximately 50 acre-credits. At a 1:1 credit ratio, the 30 acres of proposed estuarine wetland and waters reestablishment (tidal marsh, intertidal mudflat and tidal channel) could potentially provide approximately 30 acre-credits.[18] See Appendix D.

Per this analysis, proposed HBAM restoration actions (perform forested/scrub wetland rehabilitation and enhancement, or, perform estuarine wetland reestablishment) will provide far more mitigation credit than is required to offset impacts associated with the Eureka-Arcata Route 101 Improvement Project.

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[16] These documents can be found online at http://www.spd.usace.army.mil/Portals/13/docs/regulatory/qmsref/ratio/12501.pdf

[17] Approximately 78 acres of forested/scrub wetland restoration is proposed at the Samoa Parcels. Additionally, under either a full or muted tidal alternative at Lanphere—a further 5 acres of forested/scrub wetland restoration in proposed.

[18] Estuarine wetland reestablishment will initially restore a large acreage of mudflat. It remains to be determined what mitigation credit the USACE will grant for reestablishment of this non-vegetated, but ecologically crucial wetland type.

PROPOSED SERVICE AREA

The watershed which includes HBAM, as well as the Eureka-Arcata Route101 Improvement Project—defined by USGS 8-digit HUC 10810105 (Mad-Redwood)—is proposed to define the service area of utility for mitigation credits generated by HBAM, including any advance credits.[19] See Map 2, Watershed Map.

Part II—Project Details

SAM0A PARCELS

Existing Site Conditions

The Samoa Parcels (totaling 80 acres) are located just west of the City of Arcata, between State Route (SR) 255 and Old Samoa Road (See Map 3). The Samoa parcels were selected in part because of their location adjacent to the CDFW Mad River Slough Wildlife Area (protected wild lands encompassing over 550 acres), as well as the City of Arcata's Marsh and Wildlife Sanctuary (a sanctuary of wild lands encompassing over 300 acres). HBAM proposes to provide the establishment of an additional 80 acres of protected wild lands at this location. See Map 7, Samoa Parcel Adjacency to Other Natural Resource Properties.

Prior to European settlement, approximately 75% of the Samoa Parcels was tideland, with the remainder area supporting forested/scrub wetland (see Map 9, Historic Condition of Samoa Parcels). An on-site reintroduction of tidal hydrology, while possible—has been determined unfeasible. Downslope from the Samoa parcels, freshwater ponds have been constructed on CDFW lands to benefit migratory waterfowl. The CDFW believes tidal reintroduction at the Samoa Parcels would negatively influence hydrological conditions at the ponds. However, important resource function can be restored on the agriculturally-managed wetlands to create, and encourage, native species diversity by establishing approximately 80 acres of forested/scrub wetland in a continuum, directly adjacent to 200 acres of tidal wetland restoration (the McDaniel Slough Wetland Enhancement, joint-constructed by the CDFW and the City of Arcata), see Map 10.

[19] Developing, and using, advance permittee-responsible mitigation provides increased confidence in the ability to demonstrate no net loss of resource function for both project permittee and regulators—as mitigation actions will have established functional gain prior to use for off-setting resource impact (loss).

In 2010, the western-most Samoa parcel was delineated and verified as USACE jurisdictional wetland (re-verified in 2015).[20] See Map 11. A wetland delineation will be performed at the eastern parcel this spring/summer. However for HBAM study purposes, the eastern parcel is also presumed to be wetland under USACE and California Coastal Act jurisdiction. In 2010, Caltrans constructed two acres of compensatory coastal wetland mitigation (in partial fulfillment of Coastal Development Permit (CDP) #1-07-013) by implementing forested/scrub wetland plantings along SR 255 at the parcels' northwest quadrant. The remaining approximate 78 acres of the Samoa Parcels is agriculturally-managed wetland.

The Samoa Parcels, isolated behind a levee—have long been converted to agricultural use—currently hay production and cattle grazing. Due to the agricultural management regime, wetland function and service are low. In winter, the parcels exhibit stubbly vegetation inhabited by cattle and red flies—that does see use by migratory grazing geese. In spring, some ground-nesting birds will attempt to establish nests, however, annual summer haying pre-empts most breeding success. Other than the two acre restoration area (previously performed in fulfillment of CDP #1-07-013), the parcels exhibit a single canopy layer of herbaceous/grassy vegetation and include drainage swales constructed to hasten water off-site. Pasture vegetation is dominated by non-natives (i.e. commercial forage species) such as tall fescue, ryegrass (*Lolium perenne*) and clover (*Trifolium pretense*).

The Natural Resources Conservation Service primarily classifies the Samoa Parcels' soil as Occidental, with a minor inclusion of Arlynda soils. Occidental soils are alluvial in origin and can include a peat layer over silty clay loam A and B horizons (NRCS, 2015). These soils will support forested/scrub wetland as evidenced by the now five-year established two-acre forested/scrub restoration.

Restoration Design

HBAM proposes restoration of forested/scrub wetland at the Samoa Parcels, through rehabilitation and enhancement actions. Restoration of the parcels which are located at the foot of Jane's Creek/McDaniel's Slough will serve to diversify and enhance wetland functions and services at the site (e.g. increased habitat complexity/diversity, improved water quality and increased carbon storage as habitat matures) and provide additive function/enhancement to adjacent publically-managed estuarine and freshwater habitats. Providing for increased wild lands (expanding available natural habitat) at this location neighboring the Jane's Creek ecological continuum (from tidal marsh to coniferous forest) will improve ecological linkages.

[20] For further information, see *Samoa and Demello South Parcels Wetland Delineation Report* (Caltrans, 2009) and *Demello South Further Site Investigation* (Caltrans, 2010).

Providing tree and shrub canopies at the site (i.e. forested/scrub wetland) will create conditions providing food and cover for native birds and mammals (e.g. neo-tropical bird nesting habitat, shorebird night roosting, passerine perch sites and tall grass habitat for small mammals). Additionally, proposed forested/scrub wetland will provide a transition zone to accommodate future shifts in species distribution, thus supporting an inland migration of tidal marsh due to SLR—enhancing ecosystem resilience to climate change. Under conditions of SLR forested wetlands will become skeletal forest, providing in-water habitat structure for aquatic species, as well as valuable rookery sites for shorebirds.

Figure 3. Agriculturally-managed wetland at Samoa Parcels, from southeast corner—Old Samoa Rd at left, portion of V Street at right.

Figures 4 and 5. Two acres forested/scrub wetland restoration at northwest corner (October 2015), and structures at Parcel's east side boundary.

DESIGN ELEMENTS

Rehabilitate and Enhance Freshwater Wetland (Establish Tree/Understory Canopies)

The Humboldt Bay forested/scrub wetland (a mosaic of tree, shrub, marsh and meadow) would have been characterized by a species assemblage of plants with high diversity. A plant palette will be developed for submittal with the final HBAM project plan (mitigation and monitoring plan) making use of as many of the below-listed native wetland species as commercially-available and practicable.

Caltrans has found extant fragments of forested/scrub wetland within the region to include the following native species: Hooker's willow (*Salix hookeriana*), narrow-leaved willow (*S. exigua* var *exigua*), red willow (*S. laevigata*), arroyo willow (*S. lasiolepsis*), Pacific willow (*S. lasiandra* var. *lasiandra*), Sitka willow (*S. sitchensis*), Scouler's willow (*S. scouleriana*), Sitka spruce, red alder, Oregon crabapple (*Malvus fusca*), wax myrtle (*Morella californica*), cascara (*Frangula purshiana*), California blackberry (*Rubus ursinus*), elderberry (*Sambuccus racemosa*), salmonberry (*Rubus spectabilis*), California rose (*Rosa californica*), twinberry (*Lonicera involucrata*), currant (*Ribes sanguineum*), small fruited bulrush (*Scirpus microcarpus*), low bulrush (*Isolepis cernua*), Baltic rush (*Juncus balticus*), soft rush (*J. effuses*), bur-reed (*Sparganium eurycarpum var. eurycarpum*), Pacific potentilla (*Potentilla anserina* ssp. *pacifica*), Pacific aster (*Symphyotrichum chilense*), Pacific water parsley (*Oenanthe sarmentosa*), Hall's bent grass (*Agrostis hallii*), Lyngbye's sedge (*Carex lyngbyei*), tufted hairgrass (*Deschampsia* sp.), meadow barley (*Hordeum brachyantherum*), skunk cabbage (*Lysitchiton americanus*), sword fern (*Polystichum munitum*), wild cucumber (*Marah oregana*), slough sedge (*Carex* sp.) and *Equisetum* sp.. It's likely that Oregon ash (*Fraxinus latifolia*), cottonwood (*Populus trichocarpa*), nine-bark (*Physocarpus* sp.), snowberry (*Symphoricarpos* sp.), and service berry (*Amelanchier* sp.) would also have been found in the forested/scrub wetlands of Humboldt Bay.[21]

The Potowat Health Village, located in the Arcata Bottoms, includes a restored forested wetland/marsh mosaic called Ku'-Wah-Dah-Wilth (Comes Back to Life) which includes many of the above listed-species, as well as five-finger maidenhair fern (*Adiantum aleuticum*) and wild grape (*Vitus californica*) (UIHS, 2014). In the Handbook of North American Indians (Heizer, 1978), the Wiyot people are described to have made use of California hazel (*Corylus cornuta*) and woodwardia fern (*Woodwardia fimbriata*), both of which would have been present above the elevation of tidal inundation on the coastal plain. Additionally, poison oak (*Toxicodendron diversiloba*) and stinging nettle (*Urtica dioca*) are both known to be useful to wildlife species and are commonly associated with transitional riparian areas in Humboldt Bay; they may also be effective in minimizing human trespass in the project area.

[21] The USFWS describes two wetland types within the freshwater tidal zone of the Columbia River estuary that strongly correlate to the forested/scrub wetland of the Humboldt Bay area, a Sitka Spruce Swamp-Palustrine Evergreen Forested Tidal Swamp and a Palustrine Tidal Scrub-shrub Swamp. As described these two freshwater forested/scrub wetland types include many native species/genera that are common to the Humboldt Bay area (USFWS, 2014).

Revegetation will occur in the fall, perhaps as early as 2017. Planting material will be outgrown from regionally appropriate native stock. Because the site is currently dominated by non-native forage species, native herbaceous species may have difficulty competing. Therefore, plantings may be staged, with tree and shrubs installed initially, and herbaceous plantings occurring later (within shade created by tree/shrubs).

To improve available soil nutrients and create favorable conditions for mycelia, soil amendments (including biochar), are likely to be added to the soil used to backfill individual plantings. Cardboard will likely be placed around plantings to suppress weeds; mulch will be applied. Supplemental watering is unlikely to be required. See planting plan attached in Appendix E, and Exhibit 3 (next page).

Create Habitat for Native Amphibians

Restoration activities will include modifications to the parcel's artificially drained topography with the goal of creating favorable habitat for northern red-legged frogs (*Rana aurora*) and other native amphibians. This will entail grading, or excavation, to re-contour the site—creating a seasonal swale or shallow pool feature within the natural (subtle) topographic contour. Ideally water will pool during the months January through June.

Native wetland vegetation from the land-planed drainage swales (running north/south, perpendicular to SR 255 and Old Samoa Rd—functioning to hasten water off-site) will be salvaged and reestablished within the newly constructed seasonal swale feature. The land-planed drainage swales will then be backfilled/re-contoured, and seed mix/erosion control will be applied.

Grading (and thatch salvage) to create amphibian habitat (seasonal swale) will occur during the summer/fall dry period, perhaps as early as 2017. See project description (grading plan) attached in Appendix E.

Install Interim Habitat Features

In an effort to jump-start occupancy of developing habitat, interim habitat features will be installed. These may include bat houses, bird houses, woody debris piles, perch sites, nest platforms, snags, coarse woody and/or large woody debris and etcetera. Individual native species will be identified for conservation; interim habitat design will reflect these species needs (e.g. wood chips or drilled wood for solitary bees).

Installation of woody debris, perch poles, snags, bat and bird houses and etcetera may occur in coordination with aforementioned grading activities (to avoid impacting re-vegetation efforts)—perhaps as early as summer/fall of 2017. See Appendix F, WSDOT Guidance on Wildlife Habitat Structures in Wetland Mitigation Sites.

Exhibit 3. Google Earth imagery of the Samoa Parcels with photo simulation of forested/scrub wetland restoration.

Perform Water Quality Improvements

A pre-treatment bioswale will be constructed at the SR 255 toe-of-slope, to intercept, hold and pre-treat stormwater prior to entry to site. Additionally, treatments of biochar and/or myco-remediation may be developed and deployed—to demonstrate improvements to water quality prior to stormwater entering the bioswale.

Construction of the bioswale will occur in coordination with site grading actions during the dry period—summer/fall, perhaps as early as 2017. Installation of biochar socks, or mycelia-inoculated straw wattles can be performed by hand, and may occur outside the dry period (the final plan will include a specification for this). See Appendix E.

Functional Lift

The functional lift of proposed Palustrine Forested/Palustrine scrub-shrub wetland restoration (rehabilitation) and enhancement was previously demonstrated in comparison to the Eureka-Arcata Route 101 impact site—in Step 2 of QMS 12501.6 (estimating mitigation credit potential, Appendix D). However to evaluate functional lift to be derived at the site from proposed management actions in comparison to current site condition—functions and services were compared between the two wetland types Palustrine Forested/shrub wetland versus agriculturally-managed Palustrine Emergent wetland—using functions/services considered important to the public interest, under federal policy for evaluating wetland permit applications (33 CFR Subsection 320.4(b)).

As demonstrated in Table 1, page 31, HBAM actions to restore and enhance forested/scrub wetland at the Samoa parcels will result in substantial improvements to at least five of the eight listed wetland functions and services. Forested/scrub wetland will serve essential ecologic functions, providing habitat for northern red-legged frog, bats and birds (rare, protected and proposed for management species), and other native animals—and providing additive function to the estuary, and the Jane's Creek riparian corridor (i); proposed forested/scrub wetland mitigation will create a de facto refuge (ii); Forested/scrub wetland will *beneficially* affect natural drainage patterns (iii); forested/scrub wetland will reduce site erosion from agriculture, increase infiltration rates versus grazing/haying, reduce storm water turbidity and improve water quality (iv, v, vii), and to-be-restored forested/scrub wetlands are exceedingly scarce in quantity to the area when compared to their historic distribution (viii).

LANPHERE PARCEL

The Lanphere Parcel is located adjacent to the Mad River Slough, west of the City of Arcata, at the end of Lanphere Road (see Map 3). The parcel was selected in part because of its location adjacent to the Mad River Slough and the USFWS Humboldt Bay National Wildlife Refuge's Lanphere and Ma-le'l Dunes Units. (The Lanphere and Ma-le'l Dunes units protect approximately 900 acres of wild lands). HBAM proposes to provide the establishment of an additional 78 acres of protected wild lands at this location. See Map 8, Lanphere Parcel Adjacency to Other Natural Resource Properties.

Because the Lanphere Parcel is proposed for a complex restoration design and includes diverse site conditions, consulting ecologists and hydrologists were engaged to prepare the *Lanphere Parcel Restoration Project Concept Design Report* (Lanphere Report). The Lanphere Report includes the following technical studies: site reconnaissance and data review; existing levee evaluation; topographic/vegetation survey and hydrologic monitoring; hydrologic and hydraulic modeling, and a site evolution study. The Lanphere Report has been included as Appendix A.

Existing Site Conditions

Prior to European settlement, a substantial portion of the Lanphere Parcel was tidal marsh and mudflat, with the remainder area likely supporting transitional brackish marsh and forested/scrub wetland (see figures 3-1 and 3-2 of the Lanphere Report, Appendix A). The site is now situated behind a levee and is dominated by an approximate 38.5 acre pasture that contains approximately16.3 acres of upland (including an approximate 0.8-acre relict dune) and 22.2 acres of grazed Palustrine Emergent Wetland (with an inclusion 2.0 acres of low-quality brackish marsh, present due to leaking tide gate).[22] Approximately 10 acres of highly valuable riparian corridor (forested wetland) exists onsite immediately adjacent to the pasture. The length of the

[22] All but the relict dune would qualify as coastal (one-parameter) wetland.

riparian corridor is bounded to the east by pasture, and to the west by a dirt road (Lanphere Road). The remainder of the parcel acreage is comprised of the extant levee, the dirt road, freshwater marsh, upland dune forest and open dune. Caltrans performed a wetland delineation that was verified by USACE (and re-verified in 2015, see Map 12). For addition detail on current and historic site conditions, please see chapters 2 and 3 of the Lanphere Report.

Restoration Design

Important wetland function can be restored at the agriculturally-managed site (wet pasture and upland)—creating and encouraging native species diversity, directly adjacent to the USFWS Wildlife Refuge and the Mad River Slough. Restoration of the parcel will serve to diversify and enhance wetland function and services at the site (e.g. increased habitat complexity/diversity and increased carbon storage as habitat matures), and provide additive function/enhancement to adjacent estuarine and upland habitats. Providing for increased wild lands (expanding available natural habitat) at this location neighboring the Mad River Slough and the Wildlife Refuge will improve ecological linkages.

Three restoration design alternatives are being considered for the parcel: wetland reestablishment under a full tidal regime; wetland reestablishment under a muted tidal regime, and a freshwater non-tidal wetland restoration and enhancement (forested/scrub marsh mosaic). Under the full tidal alternative, the reestablishment of Estuarine Intertidal Emergent and Unconsolidated Shore wetlands, and waters, will reestablish tidal habitats that are in critically short supply for the watershed. The muted tidal alternative can also reestablish Estuarine Intertidal Emergent wetland, and Unconsolidated Shore wetlands, but will lack some of the benefits to aquatic species associated with a full tidal prism exchange. Alternatively, the freshwater non-tidal alternative (establishing Palustrine Forested and Palustrine Scrub-shrub wetlands) would create forested/scrub functions and services that are also in short-supply and highly desirable for the watershed. A further cost/benefit analysis, in discussion with wetland mitigation crediting (resource) agencies, will be required to determine a preferred alternative at the Lanphere Parcel. The discussion on alternatives that follows has been summarized from the Lanphere Report.

Figure 6. The Lanphere Parcel as seen from Lanphere Rd, looking southwest (levee can be seen at left, forested wetland of the riparian corridor at back of pasture), July 2010.

Full Tidal Alternative

The full tidal restoration alternative would allow unrestricted tidal flow into an approximately 30 acre portion of the Lanphere parcel. The existing outboard levee would be breached, and a channel network would be excavated within the existing pasture area to achieve a tidal regime that matches that of Mad River Slough (MRS). A new setback levee would be constructed east of the existing forested wetland corridor to prevent saltwater impacts on the existing, biologically important forested freshwater wetland habitat and to prevent inundation and flooding of the adjacent private parcel to the south, and also to protect Lanphere Road (sections of which are below high tide levels). The full tidal restoration alternative would require placement of fill to raise site elevations to a suitable level for vegetation colonization. Design elements for a full tidal restoration also include: construct new freshwater drainage ditch; add two new freshwater drainage culverts; fill existing drainage ditches; expand forested wetland, and restore dune forest (upland buffer). See Lanphere Report, Figure 4-1: Conceptual Restoration Plan Layout – Full Tidal Alternative.

Under the *no fill* option for full tidal alternative, of the 30 acres proposed for tidal inundation, an approximate one acre of salt marsh would be anticipated initially to reestablish, along with 29 acres of mudflat and subtidal open channels. However, within 30 years (under a mid-range predicted SLR) the site could be anticipated to evolve to 27 acres of salt marsh and two acres of mudflat. Under the *low fill* option (for full tidal alternative), approximately 5 acres of vegetated salt marsh could be reestablished initially, along with 24 acres of mudflat—and would also be anticipated to also evolve within 30 years (and mid-range predicted SLR) to 27 acres of saltmarsh and 2 acres mudflat. (See Table 4-5 of the Lanphere Report.)

Because the site is relatively low elevation in relation to sea level in Humboldt Bay (2 to 4 feet NAVD mean tide level (MTL +/- 1 foot)), importing fill to raise site elevations would promote salt marsh vegetation establishment. If no fill is imported, then the habitat restoration effort would result in primarily tidal mudflat creation, at least initially. By far, the largest design constraint (and potential cost) for the full tidal alternative is associated with importation and handling of earth fill, to raise portions of the site to an elevation that would support the establishment of marsh vegetation, and to construct a new setback levee.

Placing fill within the site would be contingent on how much fill would be locally available and could be acquired for the site, and costs associated with acquisition and transportation of the fill material (the farthest potential fill source considered is 30 miles from the site). Other considerations related to fill availability and quality would be: project phasing; priority of other projects in the area requiring fill; soil suitability for levee/berm construction or vegetation establishment, and soil contamination. Depending on project phasing, fill may become available as needed, which would alleviate pressure to acquire the total fill volume at one time.

Intertidal mudflat and salt marsh habitats would provide rearing habitat for fish and other aquatic species; foraging habitat for fish, birds and mammals; and would tend to be nutrient-rich, supporting low-trophic productivity (i.e. zooplankton, phytoplankton, and algae production). Breaching the MRS levee to the project site would restore hydrologic connectivity with MRS and would reestablish historical hydrology (i.e. full tidal) and habitat types (i.e. salt marsh, intertidal mudflats, and subtidal open water channel networks). Mudflat habitats are succeeded

over time by salt marsh habitats, depending on natural accretion rates (i.e. sedimentation and organic accumulation); therefore, they would readily self-adjust to sea level rise and would provide a buffer to adjacent communities that could be negatively affected by sea level rise.

Restoring hydrologic connectivity with MRS would allow fish species to benefit and may provide a good opportunity to establish eelgrass within excavated channels near mudflats. Eelgrass provides essential foraging for Pacific brant (*Branta bernicla nigricans*) and high habitat values for fish and invertebrate species.

Restoring the site to habitats that historically were present would be the most sustainable option, would provide the greatest ecological function and value, and would improve habitat continuity within the MRS area. Natural biogeochemical processes and continuity with MRS habitats would be restored, leading to less maintenance of the restored self-sustaining tidal areas in the long term.

While a full tidal alternative would be most historically appropriate, it is also the most costly alternative (approximately $4,680,000 for a low-fill option). Additionally, a substantial acreage of mudflat (i.e. Unconsolidated Shore wetland, a non-vegetated wetland type) would initially be anticipated to reestablish. It remains to be determined if the USACE will consider mudflat reestablishment for wetland credit, therefore it is unknown if sufficient mitigation credit would be generated under this alternative to justify the cost. For the complete full-tidal design details and alternative analysis, please see the Lanphere Report, Chapter 4: Restoration Design Alternatives, and Chapter 6: Summary of Design Alternatives and Conclusions.

Muted Tidal Alternative

The muted tidal restoration alternative would rehabilitate the existing outboard levee and would install an inlet/outlet water control structure to create a muted tide range within the site.[23] The muted tidal restoration alternative would require minimal fill because the water control structure would create a tidal regime that would be compatible with existing site elevations. Muted tidal hydrology at the project site would include construction and maintenance of a setback berm (rather than full flood control levee) along the forested wetland boundary and bordering the private property to the south—to protect the property, the forested wetland and Lanphere Road from flooding and salt water intrusion. The alternative would include rehabilitating the existing MRS levee with hydraulic control structures to create the muted tidal hydrologic regime. Design elements also include: install drainage outlet structures; construct new drainage swales; fill existing drainage ditches; site grading/habitat layout, expand forested wetland; restore dune forest (upland buffer), and vegetation establishment. See Lanphere Report, Figure 4-5: Conceptual Restoration Plan Layout – Muted Tidal Alternative.

[23] A “muted” tide range is characterized by a tidal environment in which the high tides are lower and the low tides are higher than the adjacent natural tidal environment, thereby producing a smaller tide range within the restored area (AECOM, 2015, Appendix A).

Creating muted tidal hydrology *without placing fill* would reestablish approximately 8 acres of intertidal salt marsh, 4 acres of mudflat and 17 acres of transitional brackish marsh—which would be anticipated to evolve at Year 30 to approximately 12 acres of salt marsh, 4 acres of mudflat and 14 acres of transitional brackish marsh. Conversely, a muted tidal approach *that includes site re-contouring* could reestablish 17 acres of salt marsh (i.e. a greater *initial* acreage of salt marsh than the full tidal alternative), 2 acres mudflat and 10 acres of transitional brackish marsh—however, lacking the benefit of a full tidal exchange—sediment would not accrete, thus a static condition would be created, prohibiting any further site development of salt marsh.

Under a muted tidal regime, intertidal mudflat and salt marsh habitats would provide foraging habitat for birds and mammals and possibly tide-water goby; and would tend to be nutrient-rich, supporting low-trophic productivity. Whether eelgrass habitat could be established on the fringe of the mudflats and subtidal channels under a muted tidal regime is unknown. Brackish marsh and transition scrub wetland would further enhance ecologic diversity and support nesting, rearing, foraging and hiding habitats for numerous wildlife species.

This alternative would require the most construction and maintenance of water control infrastructure. Not only would the existing MRS levee need to be rehabilitated, but a setback berm would need to be constructed (to protect the adjacent forested wetland, private property and Lanphere Road). Water control structures would be installed in the refurbished levee to control tide levels. As with the other alternatives, a freshwater drainage system would have to be constructed to convey and distribute freshwater coming from the dunes and flowing to MRS. In addition, a potential need would exist for fish screens or other passage structures to be included in the design, or fish species may become stranded on-site during low tide or may not be able to access the site at all. Muted tidal habitat restoration would allow a small daily tide range, creation of tidal and intertidal mudflat habitat; however, continued maintenance and operations would be challenging with future sea level rise.

The less costly muted tidal alternative (approximately $3,780,000 with re-contouring) would lack the benefits to aquatic species afforded by a full tidal regime, and it would require the most water control infrastructure construction/maintenance, but—it would provide for a substantial increase in wetland function and service over existing condition. For complete muted tidal design details and alternative analysis, please see the Lanphere Report, Chapter 4: Restoration Design Alternatives, and Chapter 6: Summary of Design Alternatives and Conclusions.

Freshwater Non-Tidal Alternative

The freshwater wetland restoration alternative would rehabilitate the existing outboard levee (which in need of repair) and would establish/enhance freshwater marsh and forested wetland (i.e. forested/scrub wetland) within the existing wet meadow and upland pasture areas. Accumulated freshwater at the project site (from precipitation and groundwater seepage) would drain to MRS via water control structures in the MRS outboard levee. See Lanphere Report, Figure 4-9: Conceptual Restoration Plan Layout – Freshwater Non-Tidal Alternative.

Rather than restoring the historical hydrologic regime, under a freshwater non-tidal alternative, the current conditions would be enhanced and agricultural pasture areas would be converted to native habitats. Habitat continuity would be expanded with the existing forest, freshwater marsh, and dune communities. Tree and shrub canopies would be established within the pasture area, and the relic dune would be restored to coniferous dune forest (restoring upland buffer habitat). Approximately 35 acres would see substantial increase to wetland function over existing condition (agriculturally-managed wetland and upland).

Forested/scrub wetlands exhibit a multi-layered canopy structure (comprised of an array of native plant species) providing primary biological function that supports nesting, rearing, foraging and hiding habitats for numerous avian, amphibian, and mammalian species; the variegated structure of this habitat allows for a multitude of niches inhabited by myriad wildlife. This alternative primarily would benefit terrestrial species, freshwater invertebrates, and birds—because (other than the hyphoreic zone), no hydrologic connectivity would exist between MRS and the project site besides freshwater drainage into the slough. Expanded freshwater marsh habitat would provide a productive food source for migrating birds, and expanded forested wetland would provide additional quality nesting habitat to the area. However, the natural adjustment of the site's topography to sea level rise would be inhibited[24] and could have ecological implications in the distant future, if the levee is not maintained in perpetuity.

The main design consideration for the freshwater alternative is the long-term continued maintenance of the levee and freshwater drainage structures, which would be critical for the success and survival of these freshwater habitats. This alternative is somewhat less self-sustaining than other alternatives because the freshwater habitats would have no natural buffer to sea level rise and would not be able to persist without human-intervention and prevention of saltwater intrusion from MRS. However, in the event of a levee failure, forested wetland would become skeletal forest, providing a valuable rookery site for shorebirds, and in-water habitat structure for aquatic species.

The non-tidal, forested/scrub wetland alternative would be the least costly alternative (approximately $2,450,000). Forested/scrub wetland restoration and enhancement can provide ecologically valuable wetland functions and services over existing site conditions. For full alternative analysis and design details, please see the Lanphere Report, Chapter 4: Restoration Design Alternatives, and Chapter 6: Summary of Design Alternatives and Conclusions.

Note: Due to the constraints and limitations of the human-built environment (i.e. the compaction of former tideland and the need to protect the existing forested wetland), the persistence of freshwater habitats in all three alternatives would be reliant on some maintenance and up-keep of a levee and associated freshwater drainage structures.

[24] The project site land surface elevation has subsided (i.e. compacted) over time, since the site was reclaimed for agriculture in the mid-1930s. Restoring the historical tidal habitats would lead to recovery from subsidence through natural sedimentation as a response to rising sea levels, whereas protecting the project site from hydrologic interaction with MRS would not allow natural sediment accretion (AECOM, 2015, Appendix A).

Functional Lift

The functional lift of the proposed Estuarine Intertidal Emergent wetland reestablishment (under a full or muted tidal regime), and the functional lift of the proposed Palustrine Forested/Palustrine scrub-shrub wetland restoration (rehabilitation) and enhancement in comparison to the Eureka-Arcata Route 101 impact site, has been demonstrated—see step 2 of QMS 12501.6, estimating mitigation credit potential, Appendix D.

However, in comparing restored site condition versus current site condition—functions and services were compared between the two proposed wetland types (Estuarine Intertidal Emergent and Unconsolidated Shore Wetland (and waters), and Palustrine Forested/scrub wetland) versus the extant agriculturally-managed Palustrine Emergent wetland—using federal policy for evaluating wetland permit applications (33 CFR Subsection 320.4(b)). As demonstrated in Table 1, page 31, HBAM actions at Lanphere offer a far greater suite of wetland functions and services than does the existing agriculturally-managed wetland.

From Table 1, under a full or muted tidal alternative, proposed management actions at the Lanphere Parcel will result in substantial improvements to five of eight wetland functions/services.[25] Re-established tidal marsh, mudflat and tidal channels will serve important ecologic functions, providing habitat for rare and protected species such as Humboldt Bay owl's clover, Lyngbye's sedge and possibly eelgrass (i); restored wetlands and waters will be set aside within a public wildlife refuge[26] (ii); restoration will beneficially affect natural drainage, sedimentation patterns, salinity distribution and flushing characteristics (iii); restored tidal marsh will shield shorelines from storms (iv), and, in the Humboldt Bay area, tidal marsh, mudflat and subtidal open channels are scarce compared to historic distribution (viii). Alternatively, under the non-tidal (forested marsh) alternative, proposed management actions will also result in improvements to at least five of the eight wetland functions/services (see Table 1).

[25] Only proposed forested wetland expansion (west of the area proposed for tidal/muted tidal reestablishment) can provide improvement to three of the listed wetland functions—as they are functions linked to elevations greater than 10' above sea level.

[26] The USFWS is in support of undertaking perpetuity management (and ownership) of the parcel—for inclusion in the Humboldt Bay National Wildlife Refuge, Lanphere and Ma'lel' Dunes Unit.

Conclusions

Based upon wetland impact site condition (the Eureka-Arcata Route 101 Improvement Project impact site which is Palustrine Emergent wetland and prior-converted former tideland, maintained as mowed along a highway)—either freshwater wetland mitigation, or tidal wetland mitigation—would be appropriate (in-kind) for the 10.1 acre wetland impact associated with the Project.

Similar in approach to that of a mitigation bank—HBAM avoids the pitfalls of "postage stamp" mitigation—by avoiding a piecemeal approach to mitigating wetland loss. HBAM affords an opportunity to restore ecosystem function over large areas, as opposed to small and/or isolated wetland sites. Utilizing strategically located parcels, HBAM proposes the restoration of wetland function in locations that provide additive function to neighboring, publically-managed natural resource properties—adding substantial acreage of suburban wild land.

HBAM made use of USACE mitigation regulation (the Mitigation Rule), and a watershed approach to identify appropriate compensatory wetland mitigation. Because so little actual wetland acreage has been lost to fill in the Humboldt Bay area, Caltrans has identified that the ecological need for the watershed—is for the *restoration of wetland functions* that have been nearly extirpated from the Humboldt Bay area by agricultural development—functions associated with Estuarine Intertidal Emergent and Palustrine Forested/Palustrine Scrub-shrub wetlands. Utilizing agriculturally-managed wetland at the Samoa and Lanphere parcels, HBAM will restore wetland functions that have been largely lost to the landscape and watershed.

HBAM's watershed approach demonstrates that restoration of either tidal marsh and mudflat, or forested/scrub wetland, is highly responsive to current ecologic need—and an appropriate adaptation strategy to changing climatic conditions, employing strategies of climate-smart conservation.

Forested/scrub wetland rehabilitation and enhancement will serve the needs of the watershed at the Samoa Parcels. Meanwhile, any of the three proposed restoration alternatives at the Lanphere Parcel will serve the needs of the watershed. Further discussion with resource agencies to determine the relative mitigation credit benefit of each alternative at Lanphere, in relation to cost, will be required prior to selection of a preferred alternative.

Per this analysis, HBAM restoration actions (perform forested/scrub wetland rehabilitation and enhancement at the Samoa Parcels, and perform any one of the three alternatives at the Lanphere Parcel)—will provide far more mitigation credit than is required to offset impacts associated with the Eureka-Arcata Route 101 Improvement. HBAM is capable of generating excess credits both to support the delivery of locally-funded trail projects, as well as to create advance credits for other future transportation project (with wetland mitigation needs) within the watershed, as applicable.

Table 1. Wetland Functions/Services Provided by HBAM

Wetland Function/Service[27]	Agriculturally-Managed Wetland	Restored/Enhanced Forested/scrub Wetland	Restored Tidal Marsh and Mud Flat
i) Does wetland serve significant biological function (e.g. food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species)?	**NO.** Wetlands are largely monotypic, lack species and structural diversity. Human disturbance disrupts food chain and food web production.	**YES.** Restored forested/scrub wetland will provide three-dimensional habitat supporting nesting, rearing, foraging, hiding, dispersal, and migratory corridor habitat for a plethora of native flora and fauna species, and provide for cross-habitat exchange (e.g. food chain/web production).	**YES.** Marsh ecosystems provide diverse wildlife habitat for birds, mammals, fish and mollusks.
ii) Is wetland set aside for aquatic study or as a refuge or sanctuary?	**NO.**	**YES.** Wetlands restored as mitigation require protective covenants thereby preserving them in perpetuity, creating a de facto refuge.	**YES.** Wetlands restored as mitigation require protective covenants thereby preserving them in perpetuity, creating a de facto refuge.
iii) Does wetland experience *detrimental* impacts to natural drainage or sedimentation patterns, salinity distribution, flushing characteristics or current patterns?	**YES.** Typically natural drainage patterns are modified to hasten water offsite and/or tidelands are isolated behind levees (negatively influencing drainage patterns, salinity distribution and flushing characteristics).	**NO.** Natural hydrology and drainage patterns will instead be restored (to the maximum extent practicable) and experience beneficial effects.	**NO.** Natural hydrology and drainage patterns will instead be restored (to the maximum extent practicable) and experience beneficial effects.
iv) Do wetlands shield other areas from wave action, erosion or storm damage?	**NO.** Management actions promote increased sediment loads (erosion), agricultural wetlands are confined behind levees.	**YES.** Restored forested/scrub wetland will serve as a buffer between upslope and downslope areas by reducing agriculturally-produced erosion.	**YES.** Marsh ecosystems protect shorelines from storms.
v) Do wetlands serve as valuable storage areas for storm or flood waters?	**YES.** Although at a diminished capacity due to typical agricultural uses.	**Maybe.** Function is associated with elevation $\geq$10' above sea level, however forested/scrub wetland vegetation can increase infiltration rates.	**NO.** Function is associated with elevation $\geq$10' above sea level.

[27] Functions and services have been assessed as per 33 CFR 320.4(b) Criteria.

vi) Do wetlands provide groundwater discharge at a minimum baseflow that is important to aquatic resources, or provide prime recharge?	**Maybe.** Groundwater discharge may have a role in the fresh water table that sits above sea level.	**Maybe.** Groundwater discharge may have a role in the fresh water table that sits above sea level.	**NO.** Function is associated with elevation ≥10' above sea level.
vii) Do wetlands provide significant water purification?	**NO.** Under typical agricultural management, water quality can be impaired by excess nitrogen and sediment.	**Maybe.** Function is associated with elevation ≥10' above sea level, however, restored forested/scrub wetland will increase infiltration rates, reduce flow velocities and storm water turbidity, and improve water quality.[28]	**NO.** Function is associated with elevation ≥10' above sea level.
viii) Are wetlands unique in nature or scarce in quantity to the region or local area?	**NO.** Agriculturally-managed Palustrine Emergent wetlands are ubiquitous throughout the area.	**YES.** Palustrine Forested/Scrub-shrub wetland is exceedingly scarce locally; upwards of 90% of the wetland type has experienced type conversion and exists in a degraded wetland state.	**YES.** Estuarine Emergent wetland is exceedingly scarce locally; 85 to 90% of the wetland type has experienced type conversion and exists in a degraded wetland state.

[28] Vegetated floodplains are known to improve water quality by removing nutrients from agricultural runoff (APEE, 2005).

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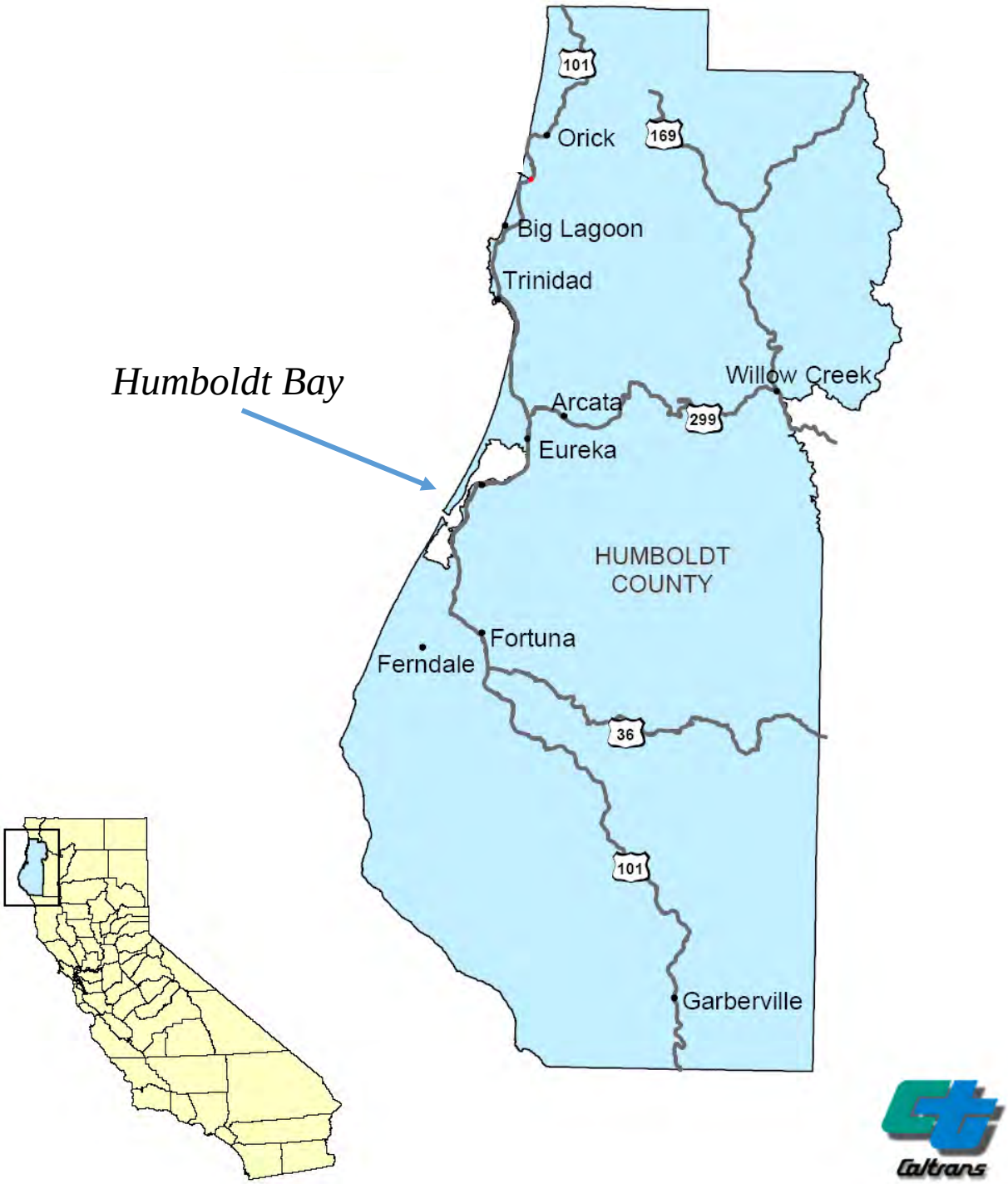
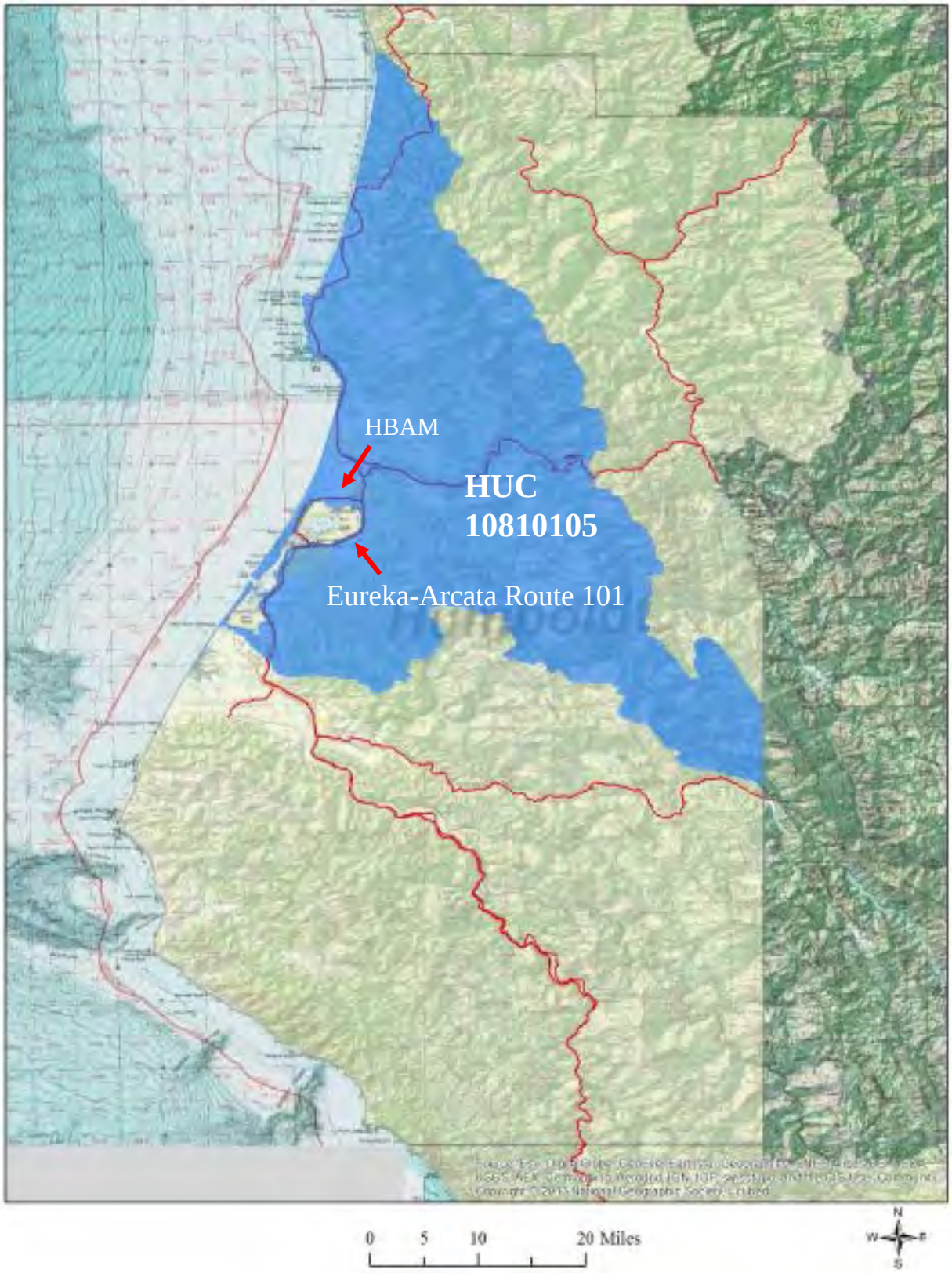
Watson, E.B., S.W. Cosby, and A. Smith. 1921. Eureka Sheet, Soil Map. United States Department of Agriculture, Bureau of Soils. Available through the Humboldt Bay Harbor and Resource Conservation Service as part of the Geographic Information System-based digital atlas, The Historical Atlas of Humboldt Bay and Eel River Delta.

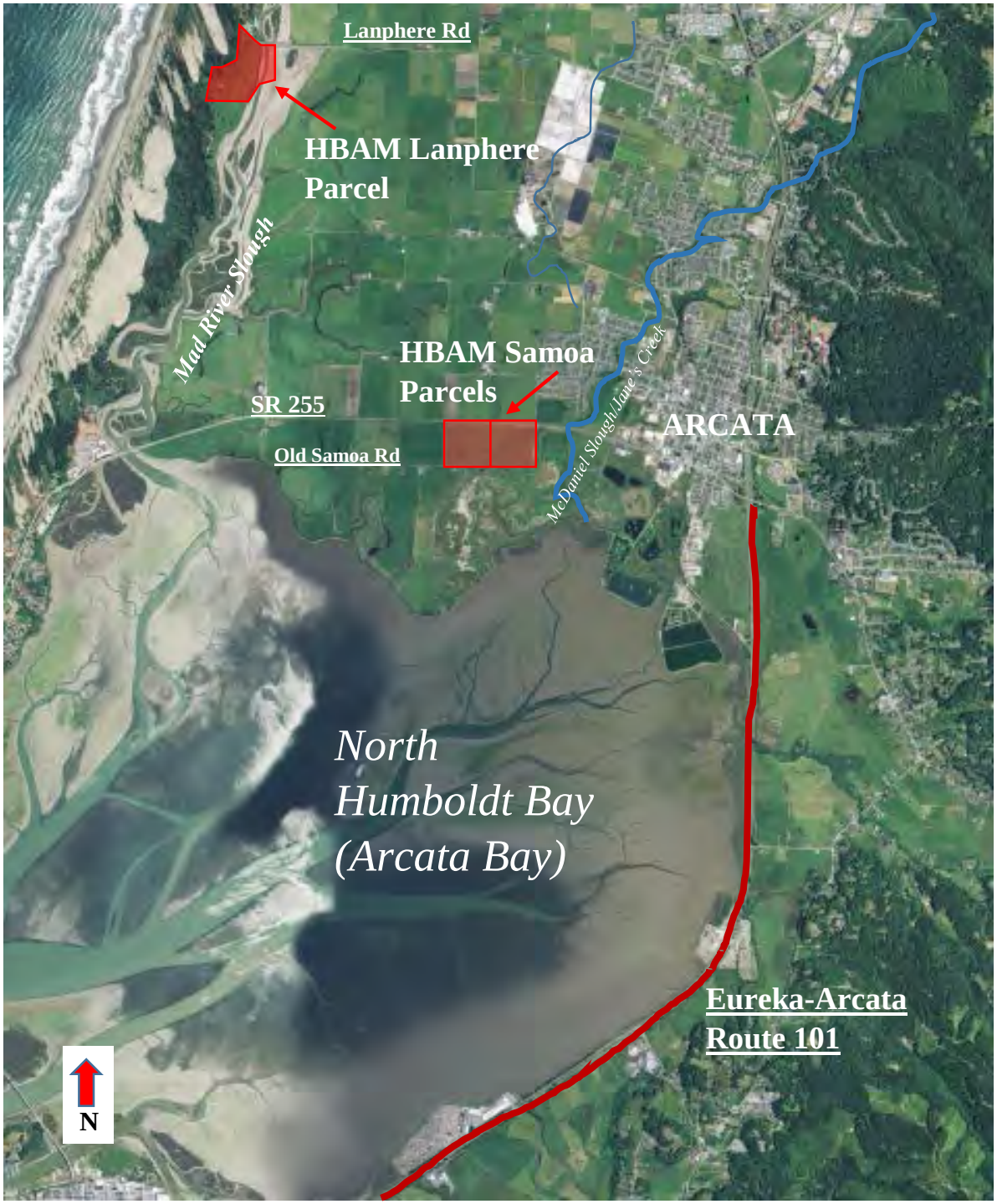
_____. 1925. *Soil Survey for the Eureka Area, California*. United States Department of Agriculture, Bureau of Soils Report.



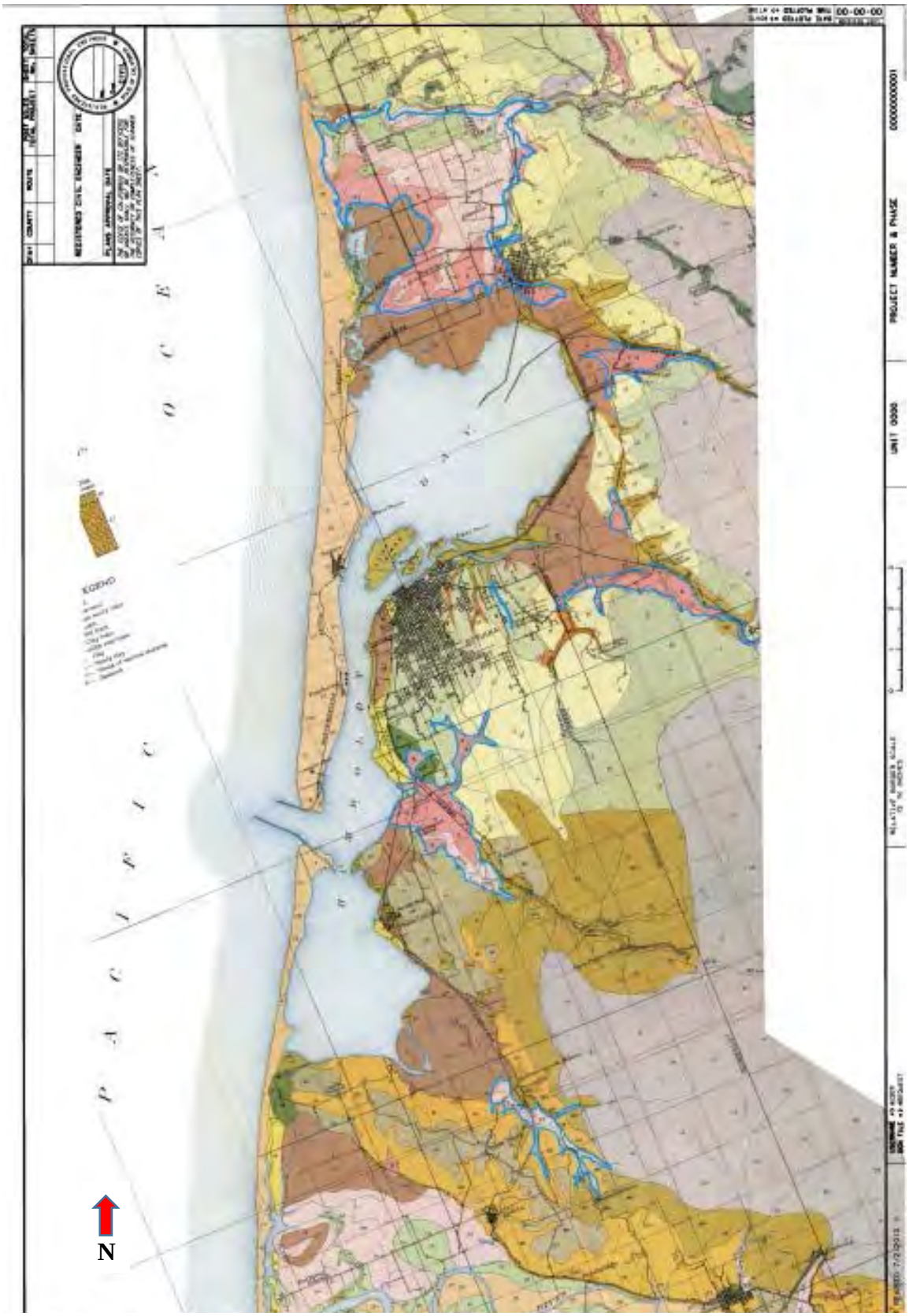
Map 1. Project Vicinity



Map 2. Watershed Map, USGS HUC 10810105 Mad-Redwood

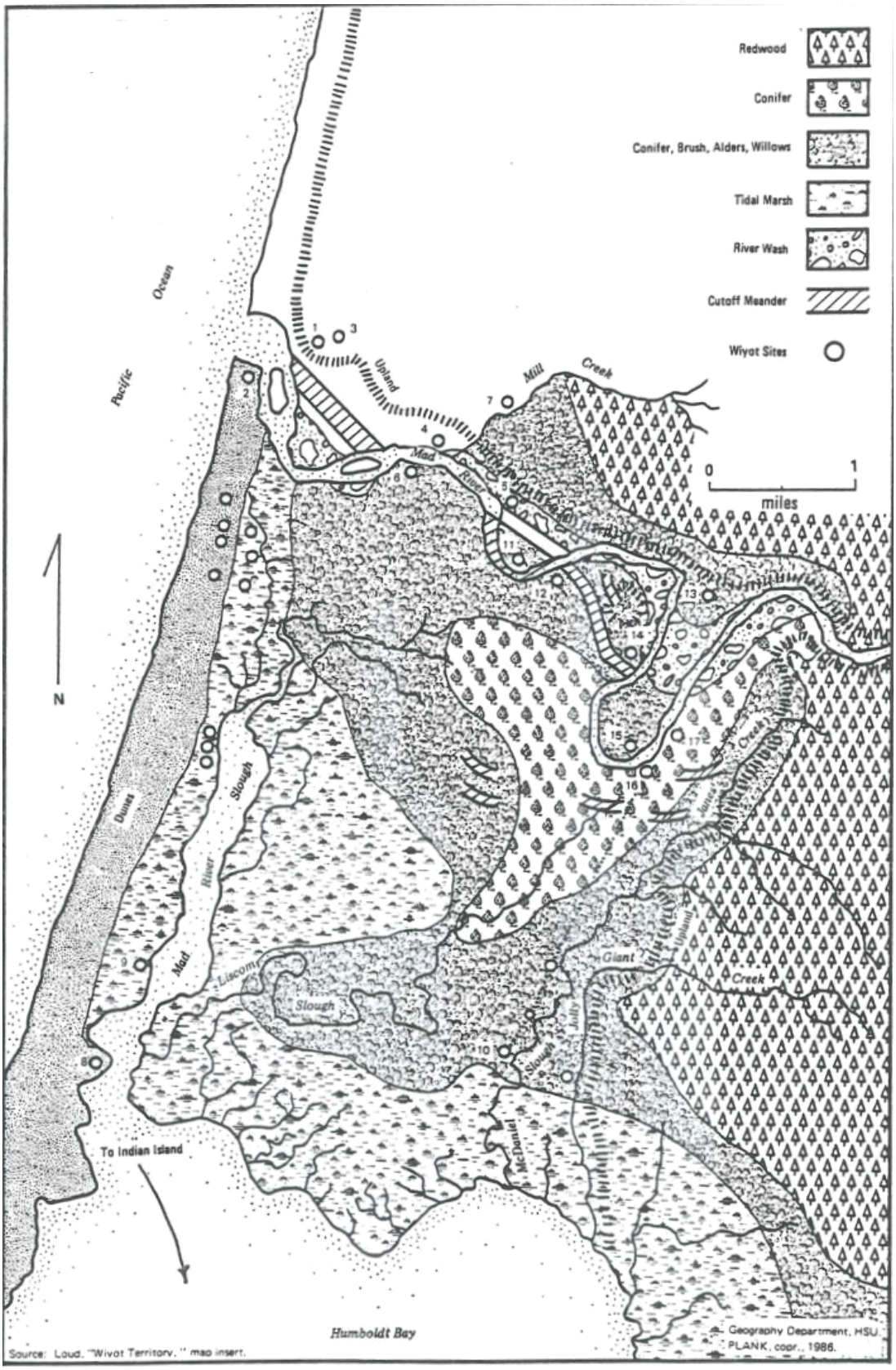


Map 3. Project Location

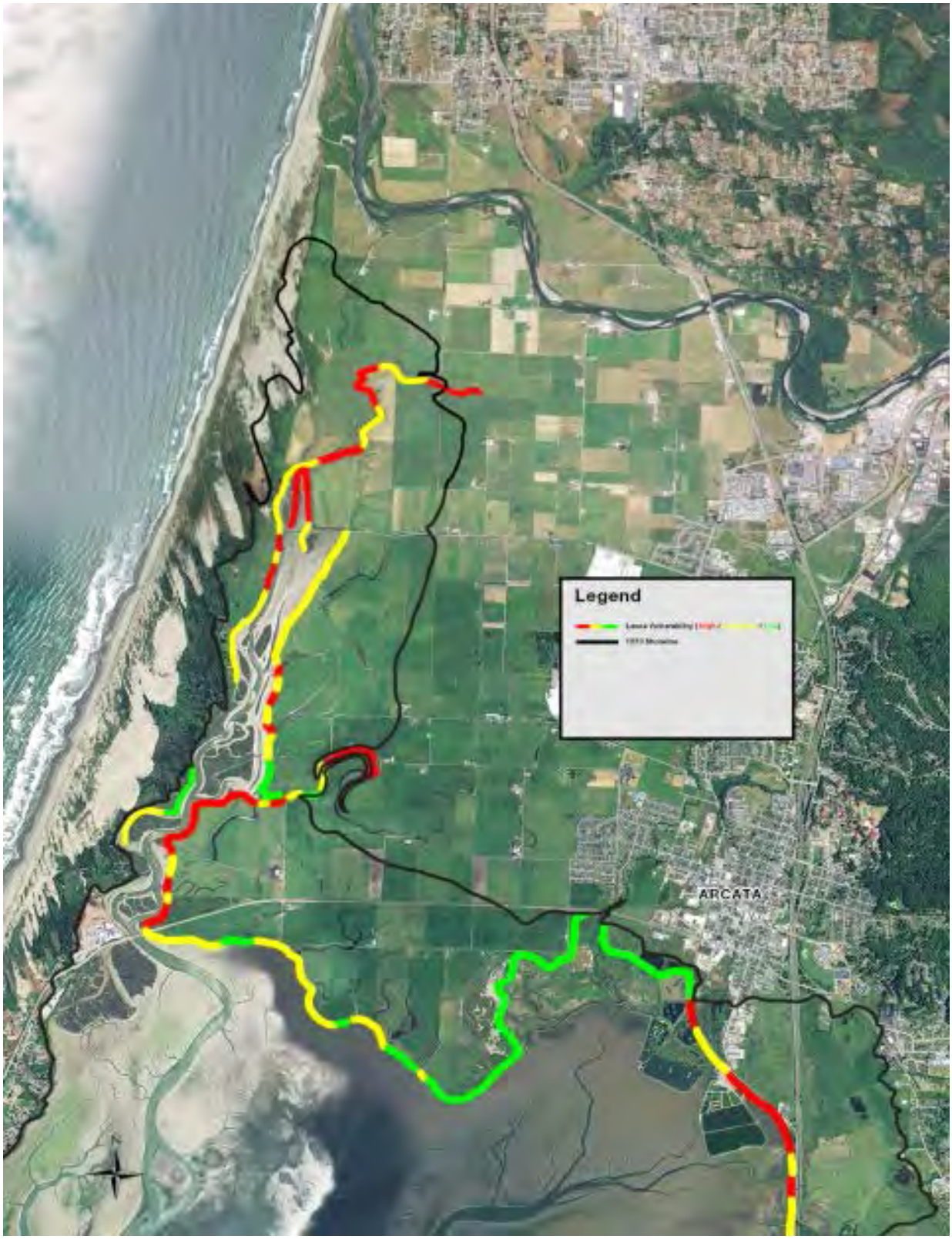


Map 4. 1921 Soil Map, Eureka Sheet (Watson et al., 1921)

Polygons defined by blue line, represent soils supporting forested/scrub wetland (Bayside Loam, Ferndale Silt Loam and Ferndale Fine Sandy Loam).



Map 5. Wiyot Landscape of Arcata Bottoms (Haynes, 1986)

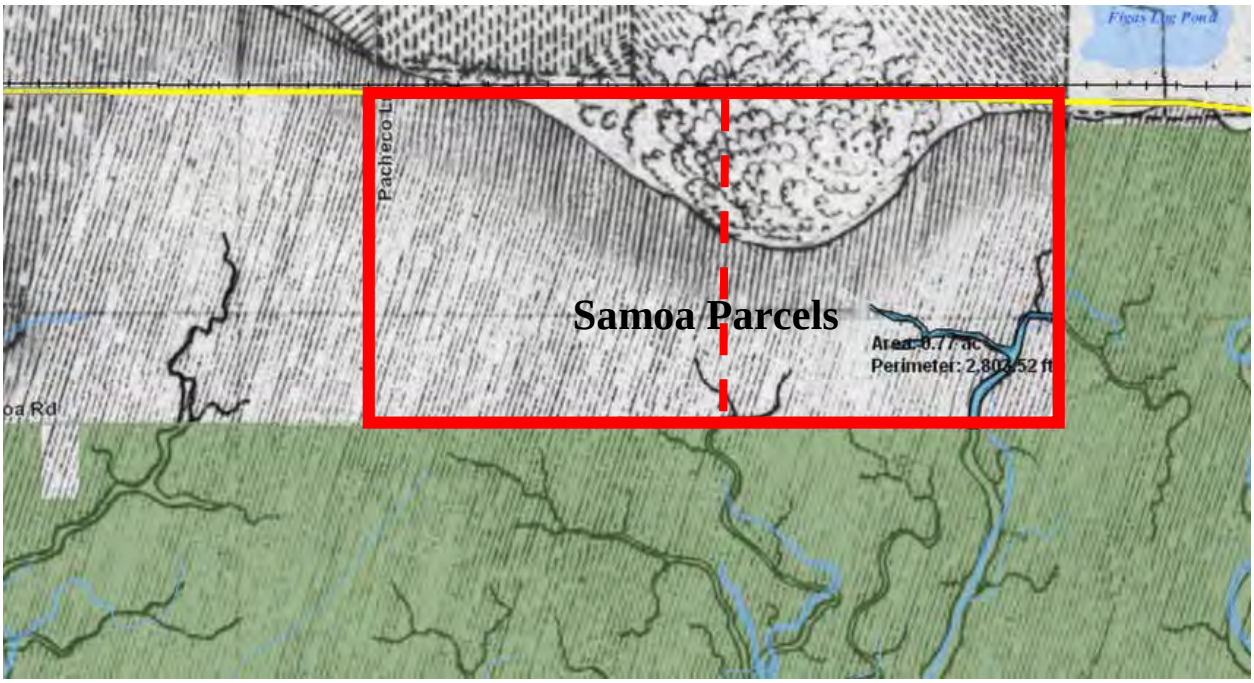


Map 6. Current Aerial

Colored lines depict today's shoreline (levees), black line depicts historic (1870) shoreline.

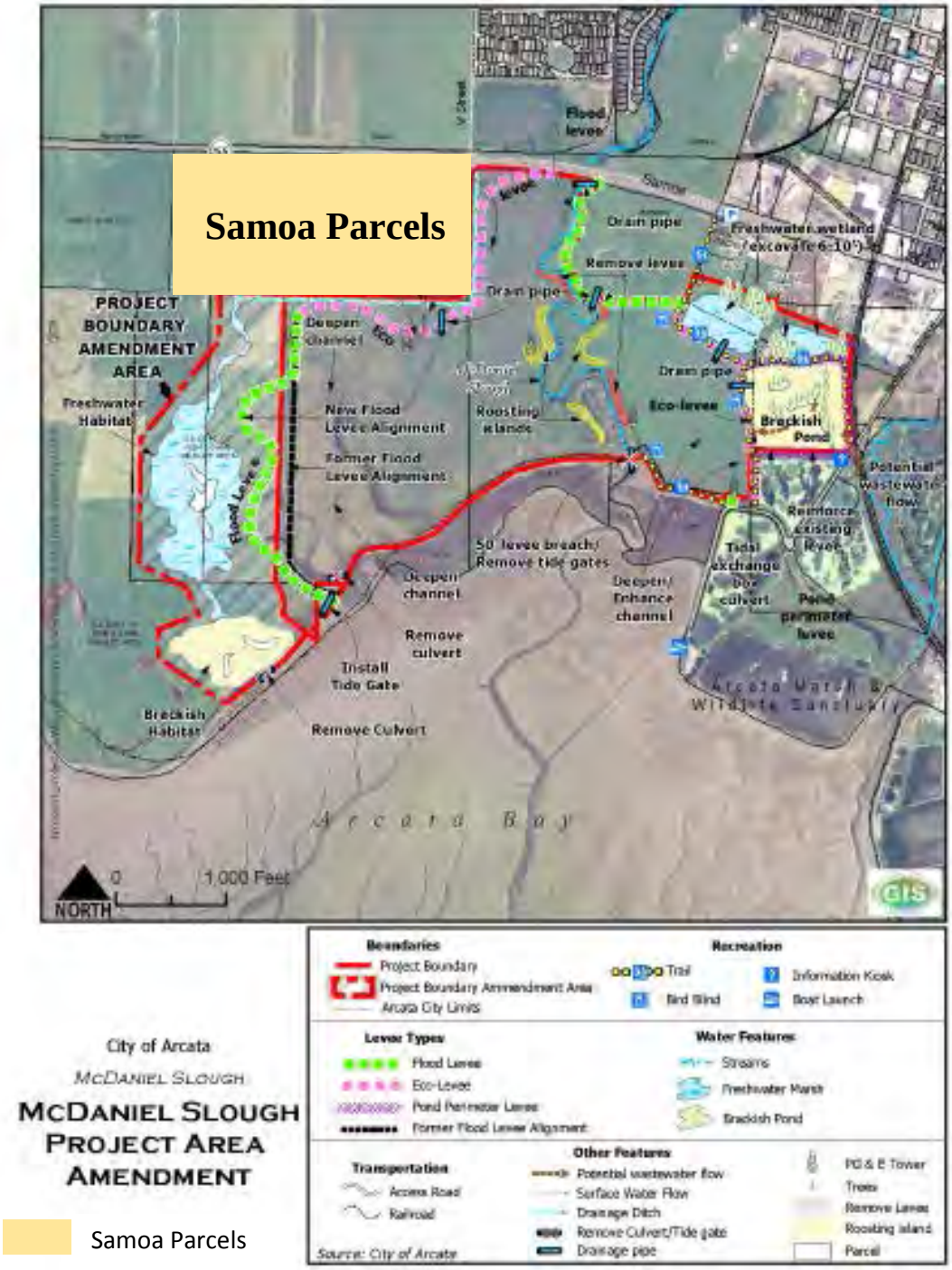
Map 7. Samoa Parcels Adjacency to Other Natural Resource Properties

Map 8. Lanphere Parcel Adjacency to Other Natural Resource Properties



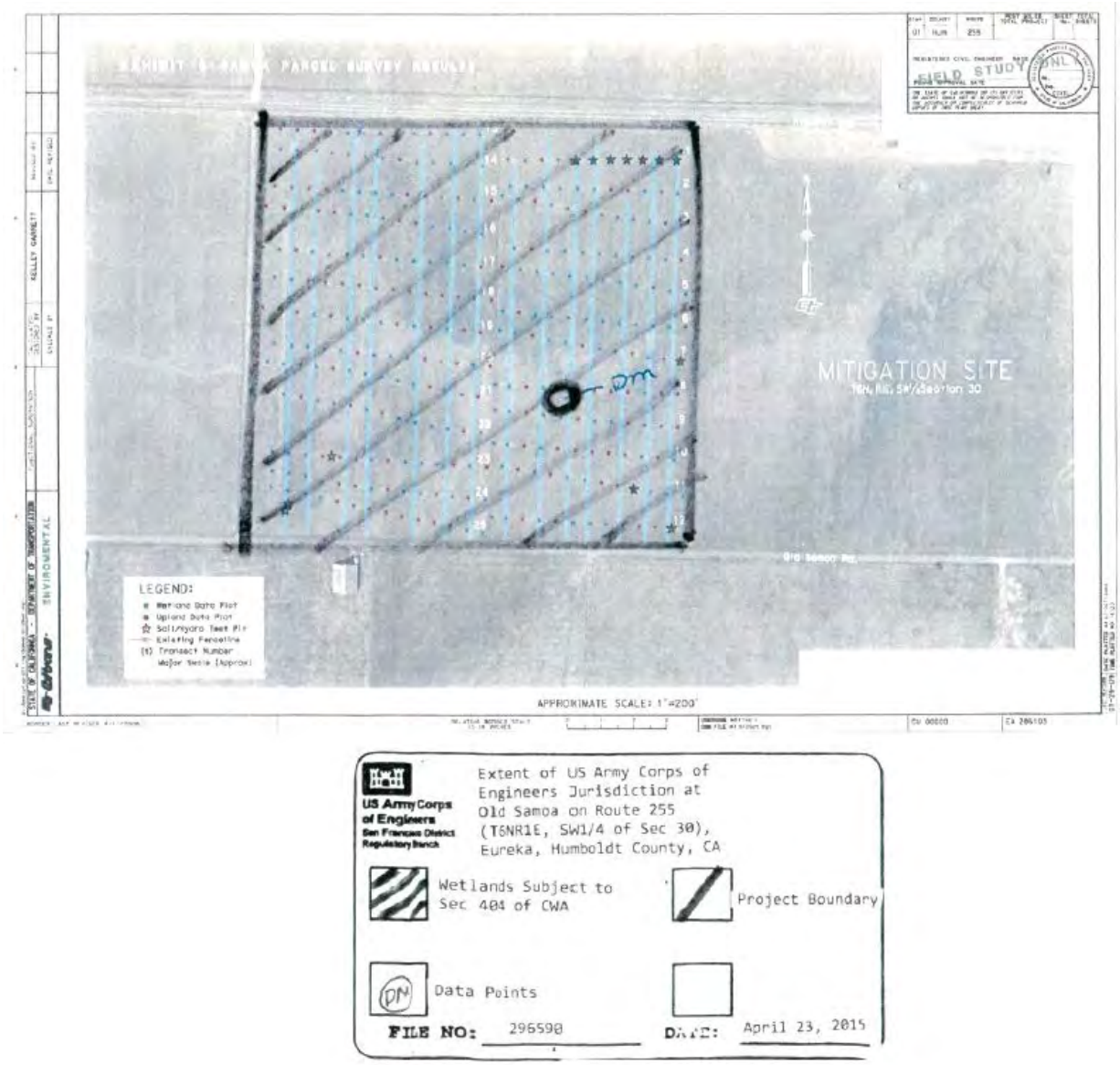
Map 9. Historic Condition of Samoa Parcels.

Map illustrates approximately 75% of the properties were tidelands and 25% was forested/scrub wetland (based upon 1870 US Coast and Geodetic Survey of Humboldt Bay). Mapping courtesy of the City of Arcata.



Map 10. Samoa Parcels in Relation to McDaniel Slough Wetland Enhancement and CDFW Freshwater Ponds.

McDaniel Slough tidal restoration bound by red lines, CDFW ponds showing at left.



Map 11. Samoa (West) Parcel Re-verified Wetland Map (2015)

Map 12. Lanphere Parcel Re-verified Wetland Map (2015)

APPENDIX A—Lanphere Parcel Restoration Concept Design Report

(To be provided electronically.)

APPENDIX B—Eureka-Arcata Route 101 Improvement Project
Wetland Impact Information

Eureka-Arcata Route 101 Improvement Project Wetland Impact Information

Project Location

The Humboldt Bay Area Mitigation (HBAM) is the proposed wetland mitigation for the Caltrans Eureka-Arcata Route 101 Improvement Project (Project), which consists of various improvements on Route 101, post miles 79.9/86.3, between the Eureka Slough Bridge and the 11th Street overcrossing in Arcata. From south to north, the Project extends from the north end of the City of Eureka, through a portion of unincorporated Humboldt County, and terminates in the City of Arcata.

Project Summary

Major Project features include closing roadway median crossings, constructing a roadway grade separation at Indianola Cutoff, replacing the southbound Jacoby Creek Bridge, and partially signalizing the Route 101/Airport Road intersection. The purpose of the Project is to improve safety; reduce operational conflicts and delay; and rehabilitate the roadway to meet current traffic engineering design standards as feasible and to extend the serviceable life of the existing roadway. After avoiding and minimizing impacts to aquatic resources to the greatest extent possible, the Project will result in unavoidable impacts to approximately 10.2 acres of wetland within the coastal zone (based on construction of the Project's Preferred Alternative - Modified Alternative 3A). Of this acreage, 8.1 acres are considered wetland under the jurisdiction of the United States Army Corps of Engineers.

Project Impact by Habitat Type

Project impacts to wetlands habitats have been identified based upon the Cowardin classification system (Cowardin, 1979). Plant communities and an analysis of wetland habitat baseline function were documented by the project biologist. The project biologist used the Wetland Evaluation Technique (WET), Volume II (Adamus et al., 1987) to assess wetland function.

Palustrine Emergent Wetland

The Project will permanently fill approximately 8.1 acres of Palustrine Emergent Wetland. The permanent fill of Palustrine Emergent Wetland would occur from the project's lane construction (proposed lengthening of acceleration/deceleration lanes at intersections), installation of additional shoulder backing, and construction of a new interchange. These to-be-filled areas consist of long, narrow strips of wetland along the roadway shoulders and median of a four-lane divided highway—over a distance of about 10 miles. These wetlands were previously substantially degraded through the construction of railway fills and levees that converted the wetlands in the project area from a tidally influenced bay system to a freshwater system.

Vegetation/Plant Community – These roadside wetlands are comprised primarily of non-native vegetation, with sweet vernal grass (*Anthoxanthum odoratum*) and tall fescue (*Festuca arundinacea*) being the dominant species (Gail Popham, project biologist, pers. comm 4/5/11).

Baseline Function/Service – The functional capacity of these freshwater wetlands is compromised by several factors including: previous conversion from tidally influenced wetland to a freshwater system; location beside, and between, a four-lane divided roadway; and routine mowing for roadway maintenance reasons. These wetlands exhibit low functionality related to production export, wildlife diversity/abundance, aquatic diversity/abundance, uniqueness or heritage value, and recreation value.[29]

Estuarine Intertidal Emergent Wetland

The Project will permanently fill an area of approximately 0.1 acre of Estuarine Intertidal Emergent Wetland. This impact is associated with the southbound Jacoby Creek bridge construction and access.

Vegetation/Plant Community – Estuarine Intertidal Emergent Wetland in the project area exhibits a plant community dominated by sedges, including Lyngbye's sedge (*Carex lyngbyei*, a California Rare Plant Rank 2B.2 species). (Gail Popham, project biologist, pers. comm 4/5/11).

Baseline Function/Service – The area provides production export for aquatic vertebrates/invertebrates, rearing and foraging habitat for federally listed salmonids, and breeding, rearing and foraging habitat for the federally listed tidewater goby (*Eucyclogobius newberryi)*.[30] Further, the area supports rare Lyngbye's sedge (see above). Based on the wetland functional analysis this wetland exhibits moderate function/service capacity.

Estuarine Subtidal Unconsolidated Bottom Deepwater Habitat

Rock will be placed in approximately 0.01 acre of Estuarine Subtidal Unconsolidated Bottom Deepwater Habitat—to construct a weir below the tide gate in Gannon Slough, thus allowing for pooling and enhancing fish habitat within the channel.

Vegetation/Plant Community – Within the project area, Estuarine Subtidal Unconsolidated Bottom Deepwater Habitat supports no vegetation or plant community. (Gail Popham, project biologist, pers. comm 4/5/11).

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[29] See the Natural Environment Study prepared for the Project for more detailed information on the wetland functional analysis.

[30] Minimization and avoidance measures have been implemented to the maximum extent practicable to avoid impacts to listed species. The Project's Section 7 consultation for federally-listed tidewater goby has resulted in determination "May Affect, Likely to Adversely Affect". The Project's Section 7 consultation for federally-listed salmonids has yet to be completed, but is likely to result in "May Affect, Not Likely to Adversely Affect" determination (Stephanie Frederickson, Project biologist, pers. Comm. 11/4/2015).

Baseline Function/Service – The affected area of Gannon Slough provides rearing and foraging habitat for federally listed salmonids, and breeding, rearing and foraging habitat for the federally listed tidewater goby. Based on the wetland functional analysis this aquatic site exhibits moderate function/service capacity.

Less-Than-Three Parameter Coastal Wetland

The Project will permanently fill approximately 2.0 acres of less-than-three parameter coastal wetland. The permanent fill of less-than-three parameter coastal wetland would occur from the project's lane construction (proposed lengthening of acceleration/deceleration lanes at intersections), installation of additional shoulder backing, and construction of a new interchange. In general, these less-than-three parameter coastal wetland occur just upslope of the previously discussed Palustrine Emergent Wetland and consist of long, narrow strips of wetlands on the roadway shoulders and median of a four-lane divided highway, over a distance of about 10 miles. These wetlands were previously substantially degraded, through the construction of railway fills and levee—that transformed the wetlands in the project area from a tidally influenced bay system to a freshwater system.

Vegetation/Plant Community – These roadside wetlands are comprised primarily of non-native species, with sweet vernal grass (*Anthoxanthum odoratum*) and tall fescue (*Festuca arundinacea*) being the dominant species (Gail Popham, project biologist, pers. comm 01/30/13).

Baseline Function/Service – The functional capacity of these freshwater wetlands is compromised by several factors including: previous conversion from tidally influenced wetland to a freshwater system; location beside, and between, a four-lane divided roadway; and routine mowing for roadway maintenance reasons. These wetlands exhibit low functionality related to production export, wildlife diversity/abundance, aquatic diversity/abundance, uniqueness or heritage value, and recreation value.

Net Affect to Wetland Function

Overall, the proposed Project will not change hydrology that currently supports wetland vegetation. Primarily, wetland impacts will be sliver fills on previously degraded wetland located within existing highway medians and shoulders—the loss of wetland function will be minimal, thus functionality of remaining wetland in the Project study area will be comparable to pre-project condition. Out of a total 10.2 wetland acres likely to be filled, 10.1 wetland acres have been characterized by the project biologist as exhibiting low-function, while the remainder 0.1 acres exhibits moderate functionality (per a WET analysis). Meanwhile HBAM will provide compensation for project impacts through the restoration and enhancement of high quality wetlands with demonstrably greater function and service versus the majority impacted wetlands (see Table 2, next page). Overall, when HBAM is included in the Project action, the end result will be a net positive affect to wetland function for the Humboldt Bay area.

Impacted wetlands at the Project site, and proposed restored/enhanced wetlands at HBAM were compared—to assess the overall net effect to wetland function/service. Out of a total 10.2 impacted wetland acres, 10.1 acres contain just one of eight characteristics/functions considered important. However, proposed HBAM will provide at least *five* of the eight listed wetland functions/services. (See Table 2, next page).

Estimating mitigation credits for HBAM provided an additional qualitative assessment to compare expected functional loss at impact wetlands versus anticipated functional gain at mitigation wetlands. The comparison determined lower resource function at Project (impact site) versus HBAM. (See Step 2 of the USACE SPD QMS 12501.1 Mitigation Ratio Setting Checklist, Appendix D of the main report)

These analyses combined with discussion of HBAM project details, demonstrate that the Project, with its proposed mitigation—will achieve an expansion (improved *quantity* and *quality*) of wetland function and service for the Humboldt Bay area, and watershed.

Table 2. Comparing Wetland Function/Services—Impact v. Mitigation Site

Wetland Function/ Service[31]	Eureka-Arcata Route 101 Impact Wetlands	HBAM Wetlands
i) Does wetland serve significant biological function (e.g. food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species)?	**NO** for 10.1 acres—Wetlands lack species and structural diversity. Human disturbance negates the development of three-dimensional habitat and disrupts cross-habitat exchanges (e.g. food chain/web production). **YES** for 0.1 acre—Extant estuarine wetlands provide habitat for rare plants and protected species.	**YES.** Restored wetland will provide nesting, rearing, foraging, hiding, dispersal, and migratory corridor habitat for a plethora of native flora and fauna species (including rare plants and protected species), and provide for cross-habitat exchange (e.g. food chain/web production) between adjacent habitats.
ii) Is wetland set aside for aquatic study or as a refuge or sanctuary?	**NO.**	**YES.** Wetlands restored as mitigation require protective covenants, preserving them in perpetuity—creating de facto refuges.
iii) Does wetland experience *detrimental* impacts to natural drainage or sedimentation patterns, salinity distribution, flushing characteristics or current patterns?	**YES.** Management of wetlands along roadways has modified natural drainage patterns—isolating wetlands behind levees, and ditching (straightening) natural waters—changing drainage patterns, salinity distribution and flushing characteristics.	**NO.** Natural hydrology and drainage patterns will instead be restored (to the maximum extent practicable) and experience beneficial effects.
iv) Do wetlands shield other areas from wave action, erosion or storm damage?	**NO.** Wetlands are confined behind levees, at or below sea level.	**YES.** Restored forested/scrub wetland will serve as a buffer between upslope and downslope areas—reducing storm water flows and agriculturally produced erosion. Restored tidal marsh will provide shoreline protection from storm surge.
v) Do wetlands serve as valuable storage areas for storm or flood waters?	**NO.**	**Maybe.** For forested/scrub wetland vegetation can reduce flow velocities and may increase infiltration rates.
vi) Do wetlands provide groundwater discharge at a minimum baseflow that is important to aquatic resources, or provide prime recharge?	**NO.**	**Maybe.** Groundwater discharge may have a role in the fresh water table that sits above sea level.

[31] Functions and services are as per 33CFR 320.4(b) Criteria.

vii) Do wetlands provide significant water purification?	**YES.** Located adjacent to roadway, wetlands provide pretreatment of storm water prior to direct entry to the bay.	**Maybe.** For forested/scrub wetland—restoration will reduce flow velocities and storm water turbidity, improve water quality[32] and may increase infiltration rates.
viii) Are wetlands unique in nature or scarce in quantity to the region or local area?	**NO** for 10.1 acres—as Palustrine Emergent wetlands, dominated by non-native vegetation, are ubiquitous throughout the area. **YES** for 0.1 acre—Estuarine habitats are unique and scarce.	**YES.** Palustrine Forested/scrub-shrub and Estuarine Emergent wetlands (forested/scrub wetland and tidal marsh) are exceedingly scarce locally; approximately 90% of these wetlands have experienced type conversion and exists in a degraded wetland state.

[32] Vegetated floodplains are known to improve water quality by removing nutrients from agricultural runoff (APEE, 2005).

APPENDIX C— Birds to Benefit from Forested/Scrub Wetland

Sharp-shinned Hawk	Orange-crowned Warbler
Virginia Rail	Chestnut-sided Warbler
Anna's Hummingbird	Myrtle Warbler
Selasphorus Hummingbird	Audubon's Warbler
Rufous Hummingbird	Black-throated Gray Warbler
Allen's Hummingbird *	Townsend's Warbler
Flicker Intergrade	Northern Waterthrush
Downy Woodpecker	MacGillivray's Warbler
Olive-sided Flycatcher	Common Yellowthroat
Western Wood-Pewee	Wilson's Warbler
Willow Flycatcher	Western Tanager
Pacific-slope Flycatcher	Spotted Towhee
Western Flycatcher	Fox Sparrow
Black Phoebe	Song Sparrow
Warbling Vireo	Lincoln's Sparrow
Tree Swallow	White-throated Sparrow
Violet-green Swallow	White-crowned Sparrow
Black-capped Chickadee	Golden-crowned Sparrow
Chestnut-backed Chickadee	Oregon Junco
Bushtit	Black-headed Grosbeak
Bewick's Wren	Brown-headed Cowbird
Marsh Wren	Bullock's Oriole
Golden-crowned Kinglet	Purple Finch
Ruby-crowned Kinglet	House Finch
Swainson's Thrush	Red Crossbill
Hermit Thrush	Pine Siskin
American Robin	Lesser Goldfinch
Varied Thrush	American Goldfinch
Wrentit *	
Cedar Waxwing	

Avian species likely to benefit from the establishment of forested/scrub wetland, per Dr. C. J. Ralph of the Humboldt Bay Bird Observatory (pers. comm. 2013).

Asterisks (*) denote species identified for watch-list (NABCI, 2014); underline denotes species identified for conservation management in California (CRHJV, 2004).

APPENDIX D—Quality Management System Document 12501.6, Mitigation Ratio Worksheet

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: **December 2, 2015**	Corps File No.:——	Project Manager: **(Caltrans) Kelley**	
	Impact Site Name: **Eureka-Arcata Route 101** Impact Cowardin or HGM type: **Prior-converted Palustrine Emergent (former tidal)**	ORM Resource Type: **wetland** **Impact area :** **10.1** **acres**	seasonal Impact distance: linear feet	
		Column A: Mitigation Alternative - Freshwater Mitigation Site Name: **HBAM** Mitigation Type: **Rehab, Enhance** ORM Resource Type: **wetland** Cowardin/HGM type: **Palustrine Forested/Scrub** Hydrology: **seasonal**	**Column B: Mitigation Alternative - Tidal** Mitigation Site Name: **HBAM** Mitigation Type: **Reestablish** ORM Resource Type: **wetland, waters** Cowardin/HGM type: **Estuarine Tidal and Unconsolidated Shore** Hydrology: **tidal**	0 Mitigation Site Name: Mitigation Type: ORM Resource Type: Cowardin/HGM type: Hydrology:
2	**Qualitative impact-mitigation comparison:** **NOTE: Step 2 qualitative comparison, attached**	Starting ratio: **1.0 : 1.0** Ratio adjustment: **-2.0** Baseline ratio: **1.00 : 3.00** **PM justification: See Step 2, attached**	Starting ratio: **1.0 : 1.0** Ratio adjustment: **-2.0** Baseline ratio: **1.00 : 3.00** **PM justification: See Step 2, attached**	Starting ratio: **1.0 : 1.0** Ratio adjustment: Baseline ratio: **1.00 : 1.00** PM justification: see tab 2
3	**Quantitative impact-mitigation comparison:** **NOTE:** Steps 2 and 3 are mutually exclusive (if Step 3 not used, then use Step 2). Currently no local Corps approved quantitative analysis (e.g. CRAM), therefore Step 3 cannot be used.	Ratio adjustment from BAMI procedure (attached): **N/A see Step 3 Note.** **#DIV/0! : #DIV/0!**	Ratio adjustment from BAMI procedure (attached): **N/A see Step 3 Note.** **#DIV/0! : #DIV/0!**	Ratio adjustment from BAMI procedure (attached): **#DIV/0! : #DIV/0!**

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

4 **Mitigation site location:**	Ratio adjustment: **0** PM justification: **Impact site and mitigation are located within the same watershed.**	Ratio adjustment: **0** PM justification: **Impact site and mitigation are located within the same watershed.**	Ratio adjustment: PM justification:
5 **Net loss of aquatic resource surface area:**	Ratio adjustment: **1** PM justification: **Rehab and enhance results in net loss of wetland acreage (See 12501.3 example #5)**	Ratio adjustment: **0** PM justification: **Reestablish results in net gain of wetland acreage**	Ratio adjustment: PM justification:
6 **Type conversion:**	Ratio adjustment: **0** PM justification: **Impact site is mowed Palustrine Emergent.**	Ratio adjustment: **0** PM justification: **Impact site is prior-converted tideland, now mowed Palustrine Emergent.**	Ratio adjustment: PM justification:
7 **Risk and uncertainty:**	Ratio adjustment: **0.1** PM justification: **permittee-responsible (see 12501.3 examples #1,3 and 5)**	Ratio adjustment: **0.1** PM justification: **permittee-responsible (see 12501.3 examples #1,3 and 5)**	Ratio adjustment: PM justification:
8 **Temporal loss:**	Ratio adjustment: **3** PM justification: **Assumes mitigation construction concurrent with impact, however trees and shrubs will take time to establish function (see 12501.3 example #1).**	Ratio adjustment: **0** PM justification: **Assumes mitigation construction concurrent with impact.**	Ratio adjustment: PM justification:
9 **Final mitigation ratio(s):**	Baseline ratio from step 2 or 3: 1.00 : 3.00 **Total adjustments (4-8): 4.1** **Final ratio: 5.10 : 3.00** Proposed impact (total): 10.1 acres; 0 linear feet to Resource type: wetland Cowardin or HGM: Palustrine emergent Hydrology: seasonal Required Mitigation: **17.17** X acres; linear feet of Resource type: wetland	Baseline ratio from step 2 or 3: 1.00 : 3.00 **Total adjustments (4-8): 0.1** **Final ratio:** **NOTE**: per Mit Rule, with no Step 3 (quantitative analysis)--final ratio cannot be less than 1:1* **1.10 : 3.00** Proposed impact: 10.10 acres; 0 linear feet to Resource type: wetland Cowardin or HGM: Palustrine emergent Hydrology: seasonal ***Required Mitigation: 10.10** X acres; linear feet of Resource type: wetland	Baseline ratio from 2 or 3: #DIV/0! : #DIV/0! Total adjustments (4-8): 0 Final ratio: #DIV/0! : #DIV/0! Remaining impact (acres): 0.00 acres Remaining impact (linear feet): 0 linear feet to Resource type: 0 Cowardin or HGM: 0 Hydrology: 0 Required Mitigation: #DIV/0! acres #DIV/0! linear feet of Resource type: 0

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

	Cowardin or HGM:	**Palustrine Forested/scrub**		Cowardin or HGM:	**Estuarine Tidal and Intertidal**		Cowardin or HGM:	0	
	Hydrology:	seasonal		Hydrology:	tidal		Hydrology:	0	
	Proposed Mitigation: Forested/scrub	**17.17**	X acres linear feet	**OR** - Proposed Mitigation: Tidal, intertidal	**10.10**	X acres linear feet	Proposed Mitigation**:		acres linear feet
	Impact Unmitigated:	0 0.00	% acres	Impact Unmitigated:	0 0.00	% acres	Impact Unmitigated:		% acres
	Additional PM comments: **Impact may be fully mitgated through Forested/scrub rehabilitation/enhancement**			Additional PM comments: **Alternatively, impact may be fully mitgated through Estuarine reestablishment.**			Additional PM comments:		
10 **CREDIT RATIO**	Final mitigation ratio can be flipped to estimate credit ratio. Example: **Column A =** a final *mitigation ratio* of 5.1:3 (i.e. 1.7:1, or 1.7-acre mitigation owed for every one-acre of impact), becomes a ***1:1.7 credit ratio*** or **0.59:1 –i.e. 0.59 acre credit for each one acre of mitigation performed. Column B = 1:1 credit ratio.**								

Step 2: Qualitative comparison of functions (functional loss vs. gain)

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	small loss	
Subsurface water storage	small loss	
Moderation of groundwater flow or discharge	small loss	
Dissipation of energy	small loss	large gain
Cycling of nutrients	small loss	large gain
Removal of elements and compounds	small loss	large gain
Retention of particulates	small loss	large gain
Export of organic carbon	small loss	large gain
Maintenance of plant and animal communities	small loss	large gain

Adjustment: -2

Justification:See 12501.5 FAQ #8 (June 2013)

From QMS 12501.5 FAQ #8
"for most functions if impact < mitigation (I<M) then use adjustment < zero **and** ≥ -2.
If impact = mitigation (I=M), then use adjustment = 0.
If I>M, use adjustment >0 **and** ≤ 4."

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage	small loss	
Subsurface water storage	small loss	
Moderation of groundwater flow or discharge	small loss	
Dissipation of energy	small loss	large gain
Cycling of nutrients	small loss	large gain
Removal of elements and compounds	small loss	large gain
Retention of particulates	small loss	large gain
Export of organic carbon	small loss	large gain
Maintenance of plant and animal communities	small loss	large gain

Adjustment: -2

Justification:See 12501.5 FAQ #8 (June 2013)

From QMS 12501.5 FAQ #8
"for most functions if impact < mitigation (I<M) then use adjustment < zero **and** ≥ -2.
If impact = mitigation (I=M), then use adjustment = 0.
If I>M, use adjustment >0 **and** ≤ 4."

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example, +, ++, +++, 0, ---, --, -).
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

APPENDIX E—Samoa Parcels Engineering and Landscape Design

State of California | Business, Housing, and Transportation Agency

Memorandum

To: Kelley Garrett
Caltrans D1 Mitigation Specialist

Date: November 6, 2015
File: Samoa Parcel Mitigation

From: **DEPARTMENT OF TRANSPORTATION- North Region**
Glenn Hurlburt, PE
North Region Hydraulics, Eureka

Subject: Project Description

Per your request on October 7, 2015 I have listed below the type of equipment that would be used and rough quantities the proposed swale, thatch salvage, and filling of the ditches that traverse the property. The digital elevation model was not accurate enough for final design purposes so a survey request was placed on October 15, 2015 to provide a digital terrain model of the area. Rough excavation quantities, staging areas, and fill quantities were developed from drawings and conversations provided by you and are shown below.

A pre-treatment swale will be constructed just downslope of the SR255 toe-of-slope, thereby intercepting, holding and treating roadway runoff prior to entry to site.

Removal of the thatch within the parcel would most likely be done by a small excavator (See Attached Plan Sheet). A two foot wide by one foot depth swath was used to estimate the amount of material needed to be removed for the thatch salvage. Quantities are as follows:

- Length of Rows – Varies 200' to 1200'
- Width of Row – 2'
- Depth – 1.0'
- Total Cubic Yards Excavated – 2,250 cy
- Total Area – 1.0 Acres

Excavated thatch material will be placed in the new swale feature to enhance propagation of wetland plant species.

Once surveys are received and the depth of the natural seasonal swale is determined by monitoring wells a more accurate estimate can be determined. At the 10% design phase an average width and length of the proposed swale with a 2.0' depth was used. This work would be accomplished by a large excavator for earth removal and a smaller piece of equipment such as a skid-steer for contour grading. Quantities for the swale are as follows:

Dimensions	Swale
Length (ft)	725
Width (ft)	108
Depth (ft)	2
Area (ac)	1.8
Excavation (cy)	4,500

Excess material will be used to backfill the small swales that traverse the property. The proposed staging area (1/4 ac) would be located just south of the existing barn (see Layout Sheet). Water source for dust control measures would be provided by the contractor. Best Management Practices (BMP's) would be used for erosion control measures. These measures will be determined during the final design phase in accordance with Caltrans construction permit with the Regional Water Quality Control Board for the type of work being proposed.

Construction Cost Estimate:

Item	Unit	Price	Quantity	Total
Roadway Excav.	cy	$25	8,400	$210,000
Erosion Control	ls	$10,000	1	$10,000
Backfill Ditches	cy	$15	2,000	$30,000
Water Pollution Prog.	ls	$5,000	1	$5,000
Pre Treatment Swale	ls	$5,000	1	$5,000
Mobilization	ls	$5,000	1	$5,000
Contingency 10%	ls			$26,000
Total				$291,000
			Call	$300,000

Total working days are estimated at 45.

If you have any questions or concerns regarding this information or hydraulic questions in general, please contact this office at 441-2037.

Glenn Hurlburt, PE
North Region Hydraulics, Eureka

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Preliminary Design

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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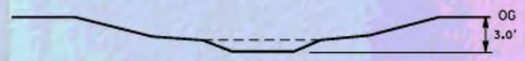
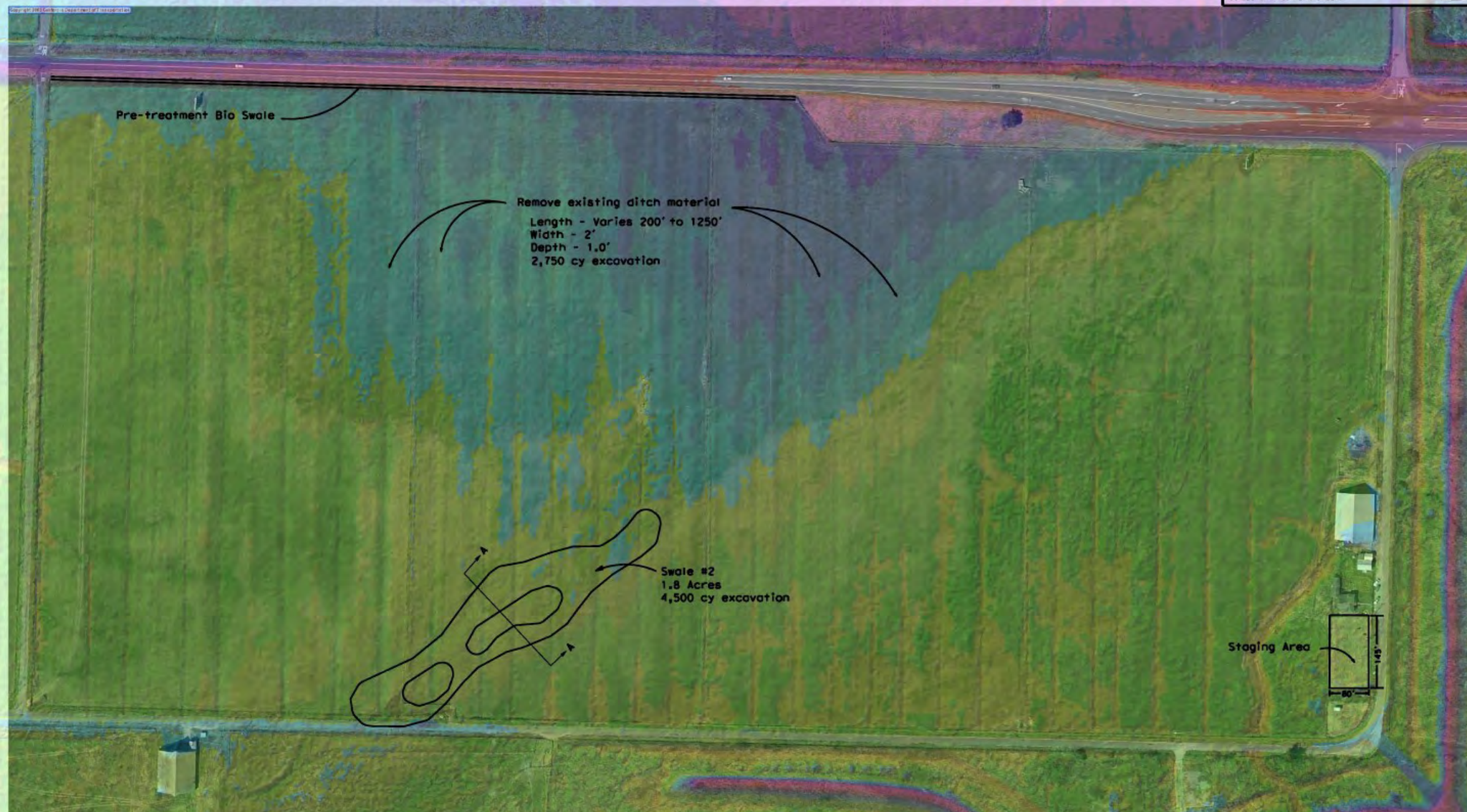


SECTION A-A



REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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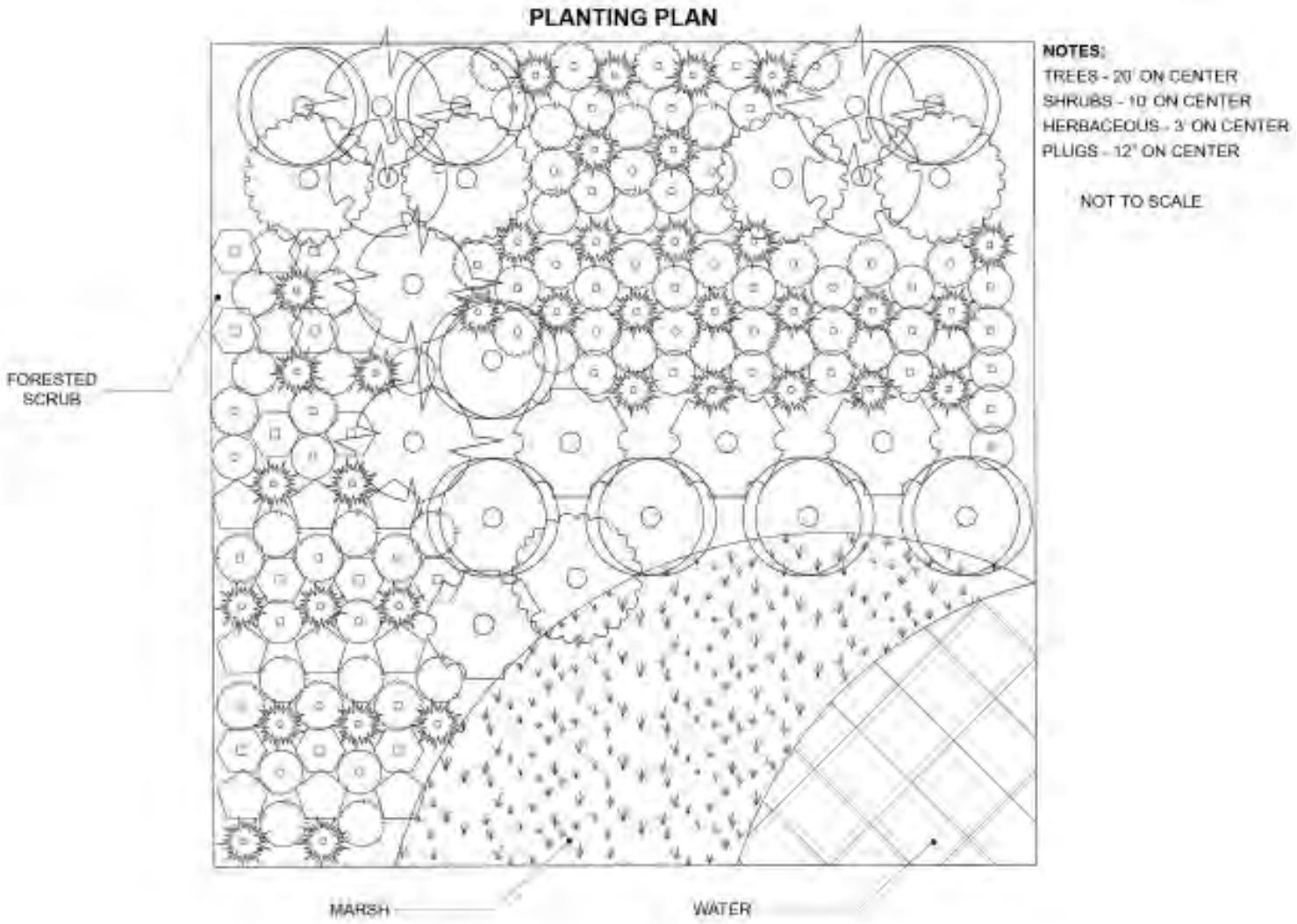

From: Pietrzak, Jeff L@DOT
Sent: Monday, November 23, 2015 12:47 PM
To: Garrett, Kelley B@DOT
Subject: Riparian Planting Costs, Landscape Estimate

Here's what I have. Riparian planting is comprised of 1,760 herbaceous, 350 woody shrubs, 520 woody trees per acre =/-

Riparian Planting @ 2,650 plants/acre @ $2.70-$3.00 ea= $8K/acre; 3 Yr Plant Establishment @ $10.60/plant x 2,650= $28K/acre = $36K/acre

<u>$36K/acre x 78 acres = $2808K</u>

APPENDIX F—WSDOT Guidance on Wildlife Habitat Structures In Wetland Mitigation Sites

WSDOT Guidance on Wildlife Habitat Structures In Wetland Mitigation Sites

Washington Department of Transportation

Environmental Services

Washington State
Department of Transportation

WSDOT Guidance on Wildlife Habitat Structures in Wetland Mitigation Sites

July 2008

By

Michael MacDonald
Wildlife Biologist

Washington State Department of Transportation
Northwest Region Biology

With contributions from the following people:

Terry Sullivan – Wetland Mitigation Specialist
Kelly McAllister – Habitat Connectivity Biologist
Gary Davis - Northwest Region Biology Program Manager
Brian Bigler – Northwest Region Biology Program Assistant Manager
David Peterson - Northwest Region Assistant Landscape Architect
Beth MacLaren – Northwest Region Landscape Architect
Deborah Peters - Northwest Region Landscape Architect
Alisa Sawich – Northwest Region Landscape Designer

WSDOT Guidance on
Wildlife Habitat in Wetland Mitigation Sites

Wetlands and adjacent uplands provide numerous habitat niches for wildlife. Wildlife habitat structures added to wetland mitigation sites are intended to jump start habitat complexity and species richness functions until natural conditions and environmental forces mature and shape the site to create self-sustaining wildlife habitat. The wildlife habitat also adds "functional lift" to the assessed value of a created site; thereby, providing a higher quality site within a constrained area. Wildlife may use these structures to locate mates, nest, and forage, as well as protection from the weather and predators. The reader should keep in mind that the basic goal for creating wetlands and habitat structures is to promote a self-sustaining food web.

This document provides guidance on habitat structure and site design in Western Washington with suggestions for experimental designs based on best professional judgment. Aspects of this document may be applicable to other roadside restoration projects such as stream relocation and restoration. A wetland mitigation site can include a few or all of the structural elements, depending on the need, size, location, and functions of the impacted wetlands. Project budget, wetland mitigation rating (category), and buffer widths may also influence the number and type of habitat structures for any given mitigation site.

Mitigation Site Location:

1. Select a site that will connect to existing habitat corridors and/or quality habitat areas. It is undesirable to create isolated habitat "islands". The site should augment wildlife movement and contribute to their life history and survival.
2. Select a mitigation site that will maximize adjacent land features. Expand existing wildlife corridors and functions by increasing the corridor width and habitat complexity.
3. Be cognizant of existing and future development within the mitigation site area which could fragment habitat corridors or diminish the effectiveness of the proposed habitat structures.
4. Some sites which fulfill wetland mitigation requirements may not always be appropriate for some species that cannot successfully and safely use the site. Site selection intended to purposefully attract wildlife should be located to avoid creating hazards to animals drawn in by the habitats.

General Guidance for Habitat Structures:

1. Salvage, recycle, and incorporate materials made available by construction and import foreign materials only when necessary. Identify and mark existing on-site material for salvage and coordinate with the design and construction offices to appropriately stockpile supplies and storage sites.
2. Each habitat feature should require little or no maintenance. This design recommendation reduces costs and human presence in the site.

3. Work with the region wildlife biologist to identify target species and appropriate habitat structures.
4. Assess the surrounding land use to determine what structures are appropriate for the desired species:
    a. A site that is surrounded by roadways may be deleterious to ground dwelling species such as small and large mammals. Therefore, in this situation, avoid habitats that may be particularly attractive to these animals.
    b. Augment existing habitat that surrounds the site rather than replicating existing features. If several perch trees are expected to be retained near the project then it would be redundant to add perch posts. However, if the adjacent property is slated for development, then temporary redundancy in structures may be desirable.
    c. Grade the site to mimic natural conditions, including ephemeral pools, but minimize fish entrapment and bull frog use. High flows encroaching into the site from nearby streams and lakes should drain out as the water recedes.
    d. Locate the site to complement adjacent land use features. It is inefficient and inappropriate to create habitat "islands" rather the site should facilitate wildlife movement and contribute to their life history and survival by contributing to existing habitats.
    e. Be cognizant of future development within the project area that could fragment habitat corridors or diminish the effectiveness of the proposed habitat structures.
5. Increase habitat functions by combining structures for multiple species, such as incorporating a perch log with branches into rock piles. Rocks should completely surround the log which is securely held in place at approximately 45 degrees.
6. Create perch points for song birds. These are prominent twigs or log ends above the supporting piles that provide the bird with a view of the surrounding area from which they can vocalize territorial bounds, attract mates, and avoid predation.
7. Secure structures that may be subject to intermittent inundation to minimize movement.
8. Generally, the bigger the structure, the better. This may have diminishing returns on extraordinarily sized structures. Keep in mind that structures are meant to resemble naturally occurring sizes, shapes, and distributions. Cost and material availability should be considered when exceeding the recommended minimum. If additional material is available from project construction, then coordinate with the region wildlife biologist and design office for guidance on increasing the habitat size or quantities.
9. Inspect habitat structures during construction to verify appropriate locations and construction methods. Early coordination with the construction office may be useful to catch design and construction problems.

Habitat Structures:

Brush piles:

1. *Intent*: Brush piles are meant to mimic dense thickets where a tree in a forest has fallen and created clumped, horizontal structures with understory vegetation.
2. *Target species*: Small mammals, amphibians, reptiles, predatory species, and passerine-sized birds.
3. *Location*: In upland sites with little or no chance of being surrounded by water.
4. *Quantity*: At least six brush piles per acre.
5. *Construction*: Wood accumulated by clearing live vegetation and downed trees should be salvaged and incorporated into piles. The center of the pile should be supported with substantial woody material (e.g. rootwads) to create and maintain loft. Stem sizes should be randomly mixed from twigs to large logs using any woody species available; however, conifers will likely last longer than other species. Branch tips or log ends should be directed skyward to create perch points. The piles should be approximately 20 feet wide by 10 feet high. Larger piles may have diminishing returns. There should be interstitial spaces in the brush pile unless stated otherwise on the plan sheets. Brush piles should be constructed by stacking the material and not dumped from a truck.
6. *Suitable example*:

Rock piles:

1. *Intent*: To mimic accumulations as might occur in rocky areas along streams, outcrops, and talus fields. The rocks absorb daytime heat and slowly release it during the cooler night.
2. *Target species*: The heated rocks provide a relatively stable thermal source and will attract ectothermic reptiles for nesting and foraging. Rock piles with sufficient mass may serve as reptile overwintering sites. Small mammals, particularly rodents, will forage, nest, and receive some protection from predators in rock piles. Rodents in turn may also serve as a food source for predatory species such as weasels, mink, snakes, and coyotes.
3. *Location*: Rock piles should be placed in upland sites with little or no chance of being inundated by water. If there are slopes in the site it may be beneficial to bury half the pile into them, particularly south facing slopes.
4. *Quantity*: It is recommended to have at least five rock piles per acre.
5. *Construction*: Rocks should be cleaned and sized from two inch diameter to two man rock (approximately two square feet) with some jagged edges. Jagged edges are used by molting reptiles and provide secure footing for small mammals. It is important to maintain a variety of interstitial spaces not exceeding six inches. The piles should be at least five feet diameter and four feet tall. Partially bury piles below the ground surface in upland areas. A perch log can be added to expand habitat opportunities for birds. If large rocks are encountered on site they may be grouped and partially buried to create burrows (approximately one square foot or greater) for larger species such as coyotes.
6. *Suitable example*:

Raptor perch poles:

1. *Intent*: To replace or augment vertical structures.
2. *Target species*: Large bodied birds, such as hawks, eagles, and osprey, as well as bats and invertebrates. As the poles deteriorate they become attractive to primary excavating species such as pileated woodpeckers. Exfoliating bark may provide day roosts for bats. Eventually the rotting wood becomes attractive to insects which in turn provide forage opportunities to birds and bats. When the poles topple they then become habitat for ground dwelling species.
3. *Location*: Uplands to provide alternate perch sites and viewing opportunities.
4. *Quantity*: There should be a minimum of three per acre; however, consideration must be give to existing perch structures. If suitable perch trees have been retained in the site or remain adjacent to the mitigation site then it may be unnecessary to provide perch poles.
5. *Construction*: The poles should be conifer tree trunks and have at least three naturally occurring side branches, at least two of which should be near the top. Manufactured side branches are not appropriate due to the varying construction techniques and insufficient results at replicating the intended habitat need. Ensure that at least 30 feet of the stem is above ground, at least 75 percent of the bark intact, and predator guard encircling the stem. Bat and bird houses can be attached to the upper third of the stem to provide cavities immediately.
6. *Suitable example*:

Nest platform:

1. *Intent*: To provide a base upon which birds can build nests and perch.
2. *Target species*: These are most attractive to osprey, which are a long-lived species and, once established, often return to nest in the same site for many years.
3. *Location*: The platform should be exposed (e.g. not under or within the canopy of a tree) and within 0.5 miles of large fresh or marine water; preferably with a commanding view of the water.
4. *Quantity*: One platform per site due to large home ranges for the target species.
5. *Construction*: Flat, either circular or square constructed of untreated plywood or cedar boards and stoutly supported and offset near the top of a tall pole or topped tree. The plywood should be marine grade or exterior and all other wood should be cedar. It should be capable of supporting at least 200 pounds of accumulated nest material. Square platforms should be four-foot square dimensions (e.g. hardwood pallets). Circular platforms should have a diameter of at least four feet. The platform edges must have a three-inch tall rim with gaps to help contain nest material but allow water to flow off. Prep the platforms with attractant sticks to simulate old nest material. The platform should be at least 30 feet above the surrounding ground but taller is preferred. Try to keep the underground portion of the support pole above the water table to reduce premature rotting. Bat houses may be attached to the upper third of the pole to double up the usage and encircle the lower stem with a predator guard. Attach an offset perch board opposite and above the platform for attending adults.
6. *Suitable example*:

Photo by James Kaiser

Snags:

1. *Intent*: To provide decadent vertical wood elements typical of a mature forest.
2. *Target species*: A variety of insects and smaller birds, particularly woodpeckers and other cavity nesters. These structures will benefit a number of insectivorous surface feeding species.
3. *Location*: Uplands, wetlands, and riparian zones. Snags may help provide erosion and debris control in riparian embankments.
4. *Quantity*: It is recommended to install as many as possible. There should be at least two stems with multiple branches of varying length, 16-inch diameter, and 20 feet tall or greater per acre, which could serve the functions of the raptor perch.
5. *Construction*: Upland and wetland snags: Snags should have at least 75 percent of the bark attached. Conifer species and larger diameter stems may last longer but any species and diameter is appropriate. Stem heights above ground can vary between 5 to 30 feet, or greater. These may double as perch poles, depending on the need and site conditions. Straight-up vertical installation is not necessary but the log should be sufficiently supported to avoid easily tipping over. Freshly cut black cottonwood can be placed in riparian areas to provide habitat for water-associated birds and small mammals. These may also serve a dual function of bank stabilization and LWD recruitment when placed in parallel rows along river banks.
6. *Suitable examples*:

Coarse woody debris (CWD):

1. *Intent*: To mimic toppled trees which create structure, water retention, and organic soil inputs as well as the habitat complexity usually present in upland sites.
2. *Target species*: Most small mammals, particularly mice, voles, and shrews, as well as amphibians, and ground nesting birds. As the structures decay they are colonized by fungi and insects which, in turn, provide food for larger animals.
3. *Location*: Primarily in uplands but these also provide habitat functionality in wetlands. As a rule of thumb CWD should be randomly scattered throughout a site. Install habitat structures close to each other so small mammals will be less exposed to predators as they travel between structures.
4. *Quantity*: As many as possible.
5. *Construction*: Can be quite varied for their size, shape, and arrangement and may include log stems, logs with rootwads, and rootwads. Log stems should have 75 percent tightly adhered bark and lie roughly horizontal on the ground. The portion of the log that lies on the soil should be longitudinally V-notched three inches deep to create small mammal tunnels and promote fungal growth. Lateral V-notches will allow additional access. Longitudinal slices into the ends will create amphibian and insect habitat niches. Larger diameter stems and conifer species will last longer but all species greater than six inches diameter may be used. Several stems with or without rootwads may be crisscrossed. Create depressions in the soil next to the rootwads to temporarily pond stormwater (i.e. to mimic lifted soil where the roots of the tree once were embedded.) and use logs that are as long as possible. Short pieces should be combined into piles or incorporated into bush piles. Distribute the logs throughout the site to minimize travel distances between structures for small mammals. Single stems without rootwads should be associated with other habitat structures (such as crisscrossed or incorporated into a rock pile) rather than individually distributed.
6. *Suitable examples*: (Log with bark attached and Rootwad with soil depression)

Large woody debris (LWD):

1. *Intent*: In aquatic environments logs in the stream bed create channel complexity, direct water flow, control erosion, and provide forage and cover for aquatic species.
2. *Target species*: Most aquatic species, including amphibians and fish, will be attracted to the diverse habitat provided by adding wood to a stream channel.
3. *Location*: A hydrologist should be consulted for constructability. Logs may be cross-laced in mid-channel while rootwads with stems are often used to create a complex bank armoring. Generally, at least a portion of the wood should be in the water during low flow and securely held into position. An occasional long stem can span the water providing a dry path between banks.
4. *Quantity*: Each site is unique and it is recommended to consult a hydrologist and stream ecologist. Streams with high energy may require larger key pieces.
5. *Construction*: All key LWD should be secured to avoid drifting and be able to recruit smaller pieces of wood. The bark should be tightly intact on at least 75 percent of each log. There are numerous options for placing wood in the stream channel. There are also several information guidelines for the preferred quantities, installation, and sizes and this document will refer the reader to these sources:
    a. Stream Habitat Restoration Guidelines – Washington Department of Fish and Wildlife: http://wdfw.wa.gov/hab/ahg/shrg/index.htm
    b. A Guide to Placing Large Wood in Streams http://www.nww.usace.army.mil/html/offices/op/rf/SLOPES/WoodPlacmnt Guide1995%5B1%5D.pdf
    c. Method Manual for the Large Woody Debris Survey – Timber Fish and Wildlife Program: http://www.nwifc.wa.gov/tfw/documents/TFW_Large_Woody_Debris.pdf
6. *Suitable example*:

Bat houses:

1. *Intent*: To replace and augment seasonal use roost sites for colonies and solitary bats.
2. *Target species*: There are potentially 11 species of bats in Western Washington that may use artificial structures for day or night roosts. Colonies rarely exceed a few hundred animals and occupied sites typically range from 1-100 individuals. During the winter months, bats in Washington hibernate or migrate out of the state and no bats are expected to use the habitats from October to March.
3. *Location*: Consult a biologist familiar with bat roost requirements for proper bat box placement. Bark on raptor perches and a snag is expected to provide foraging opportunities for birds as well as roosting opportunities for bats. Bat chamber-houses may be attached to the upper third of the perch and snag. Rocket style bat house are supported on their own posts and may be located in uplands or wetlands. The following applies to the proper placement of any style of bat house;
    a. The site should be sunny for approximately six hours. It is important for the house to receive the first sun light of the morning to warm up as soon as possible but not overheat in the late afternoon. The house should be large enough to allow the animals to adjust positions with the changing thermal conditions.
    b. Be a minimum of 15 feet above the ground.
    c. Clear of vegetation below the house for an unhindered flight path.
    d. Be within 0.5 miles of, and preferably adjacent to, water for nourishment and foraging on insects.
    e. Attach directly to large thermally stable structures such as concrete bridges. Check with the appropriate personnel before doing so.
    f. It is recommended to place predator shields around the supporting poles below the houses, particularly where there may be free-ranging domestic cats. Placing the houses over water may reduce predators.
4. *Quantity*: Two per acre may be sufficient. Two chamber houses can be placed on opposing sides of bird perch poles. Having a combination of rocket and chamber houses distributed throughout the site may yield the best results.
5. *Construction*: There are numerous sources of commercially constructed bat houses ranging from single to multiple chambers in a variety of designs and sizes. Constructing a bat house is not difficult but requires specific design and installation guidelines to be attractive to bats. Three commonly used designs include: chamber, rocket box, and Oregon wedge. Regardless of design, it is recommended that they be water tight and a dark color to absorb heat. Bats in Washington are not particularly numerous; therefore, two smaller structures per acre may be most appropriate. There are several information sources for the preferred installations and this document will refer the reader to these.
    a. Bat Conservation International http://www.batcon.org/home/default.asp
    b. Bats Northwest http://www.batsnorthwest.org/

6. *Suitable examples*:

Chamber house

Rocket box
Photo by Russell Link

Bird houses:

1. *Intent*: To create or replace lost nesting habitat.
2. *Target species*: Native birds
3. *Location*: Generally, bird houses and nest platforms are mounted on individual poles but may also be attached to trees, snags, or perch poles. These may be in upland, wetlands, or estuarine environments. Holes may be drilled near the top of snags. Open boxes or improved ledges should be located on the upper quarter of an open cliff face, shear surface, or bridge but not over water or on top of large flat surfaces, such as a tower roof.
4. *Quantity*: The quantity and style of bird houses depends on the target species. Designs vary considerably; therefore a biologist should be consulted on the appropriate design for the site.
5. *Construction*: Bird houses requiring annual maintenance are generally not recommended; however, several bird nest designs require little or no maintenance. Holes drilled in snags are attractive to several bird species; however, the hole should not compromise the structural integrity of the stem. Wire nest platforms are bowl-shaped and secured in a tree crotch. Snag holes, houses, and platform sizes and shapes are highly variable and are often species specific. The entrances, color, and design should be optimized to minimize use by invasive species such as English house sparrows, European starlings, and rock pigeons. There are numerous information sources for appropriate efforts on bird houses and species specific designs. Regional biologists and local special interest birding groups should be consulted to provide detailed assistance.
   a. Seattle Audubon: http://www.seattleaudubon.org/
   b. Falcon Research Group: http://www.frg.org/frg/index.html
   c. The Purple Martin Conservation Association: http://www.purplemartin.org/
6. *Suitable example*:

Peregrine nest box
Photo by Martin Muller

Ponds:

1. *Intent*: To provide pools for all wildlife, particularly aquatic-dependant species. Riparian edges will attract passerine birds and waterfowl.
2. *Target species*: Native amphibian, turtle, and bird (cedar waxwing, flycatchers, common yellowthroat, black-head grosbeak, and pond ducks) species. Snakes may forage on prey species attracted to ponds. It is assumed that invertebrate species will colonize the pond as the site matures.
3. *Location*: The ponds can be isolated or hydrologically connected to streams; however, keep in mind to grade the pond to avoid fish entrapment. Stream side channel pockets resembling a small pond are a variation of the intended purpose. Avoid creating suitable habitat in areas dominated by invasive species such as non-native turtle species (including snapping turtles and sliders) and bullfrogs.
4. *Quantity*: The number and sizes of ponds is often dictated by the wetland mitigation requirements therefore it is not appropriate for this document to provide guidance for this feature. If the number of ponds is an option then it is recommended to provide a mosaic of smaller ponds rather than a single large one.
5. *Construction*: Ponds may have a complexity of woody debris and live thin-stemmed vegetation. The ponds should dry out for at least two weeks during late July and August to reduce the establishment of a bullfrog population. In urban areas, persistent year round water should be avoided to reduce pestilent waterfowl; however, in rural areas year round water may be desirable where the likelihood of bull frogs is less likely. Isolated ponds should have a variety of depths whereas ponds hydrologically connected to fish bearing streams should be graded to drain as flood waters recede. Ponds should be shaded as much as possible to keep the water cool and minimize water temperature variation. Sandy soils surrounding the pond or used to construct islands within the pond may provide turtle egg laying habitat. Flowering and fruit bearing vegetation should be within sight of the pond and preferable at the waters edge.
6. *Suitable example*:

Site managers should expect alteration to plantings and structures by wildlife. Pestilent and invasive species are often attracted to wetland mitigation sites. Design considerations may limit problems with unwanted species, but seldom will an enhanced habitat be free of them. Occasionally, it may be necessary to dissuade, exclude, and perhaps eliminate destructive species. Wildlife can create unexpected changes to the intended design, but these conditions are not necessarily unwanted.

For example, native species like beaver are well-recognized for their role in building and maintaining a species-rich wetland plant and animal community. Their activities contribute to diverse habitat conditions that attract many species and provide an aesthetic quality. In these cases, it may be necessary to implement contingency actions or modify performance criteria for these unexpected, but desirable, conditions.

Lanphere Parcel (Mad River Slough) Restoration Project
Concept Design Report

Lanphere Parcel/Mad River Slough Restoration Project

Humboldt County, California

EA: 01-0E000

EFIS ID# 01-1300-0091

December 2015

Caltrans

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Lanphere Parcel (Mad River Slough) Restoration Project

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EFIS ID# 01-1300-0091

December 2015

STATE OF CALIFORNIA

Department of Transportation

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The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 USC 327.

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List of Abbreviated Terms

Caltrans	California Department of Transportation
DEM	digital elevation model
FEMA	Federal Emergency Management Agency
HBNWR	Humboldt Bay National Wildlife Refuge
LiDAR	light detection and ranging
MHHW	Mean Higher High Water
MHW	Mean High Water
MLLW	Mean Lower Low Water
MRS	Mad River Slough
MTL	mean tide level
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanic and Atmospheric Administration
PWA	Pacific Watershed Associates, Ltd. and Philip Williams and Associates, Ltd.
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Chapter 1. Introduction and Purpose

1.1. Project Summary

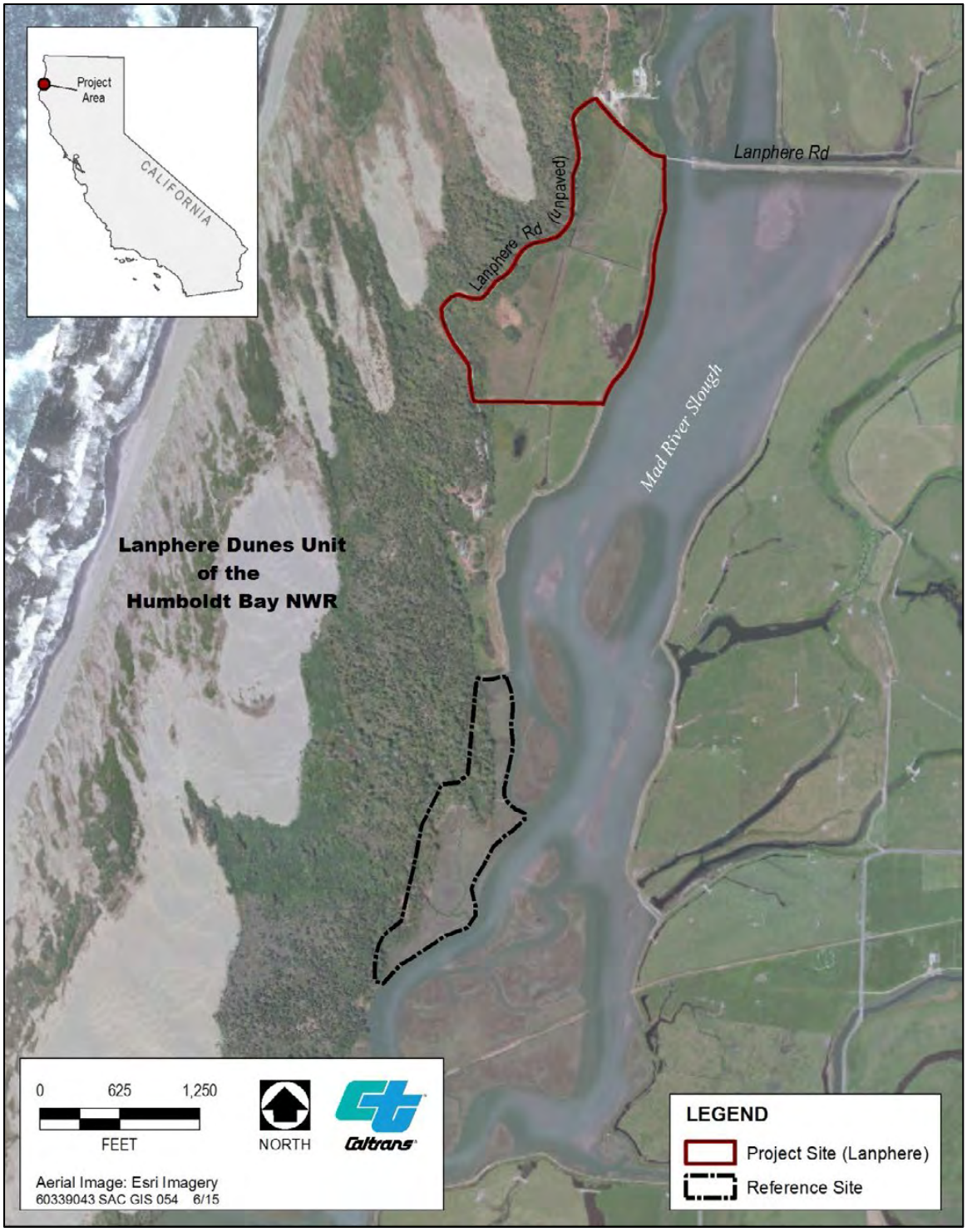
The California Department of Transportation (Caltrans) proposes to construct a wetland restoration project on a parcel of previously reclaimed tidal lands (Lanphere parcel or project site) currently managed as pasturelands adjacent to Mad River Slough (MRS) in north Humboldt Bay, California (Figure 1-1). Caltrans purchased the project site in 2010, with the intent of conducting wetland restoration and conservation at this site as compensatory mitigation for wetland impacts associated with transportation projects in the Humboldt Bay area of California.

The site is ideally suited for tidal wetland restoration, having historically supported tidal salt marsh and mudflat habitats before being diked in the 1930s and converted to pasturelands. However, substantial freshwater input from the adjacent dune complex would provide for freshwater wetland expansion and restoration at the project site if tidal restoration options are deemed undesirable or infeasible.

1.2. Report Context and Purpose

This concept design report builds on information presented in standalone technical studies previously performed in support of project design, including the Site Reconnaissance and Data Review Report (Attachment A), Existing Levee Evaluation (Attachment B), Topographic and Vegetation Survey and Hydrologic Monitoring Report (Attachment C), Hydrologic and Hydraulic Modeling (Attachment D), and the Site Evolution (Attachment E).

In this concept design report, three alternative restoration concepts are presented and evaluated for feasibility, ecological benefits, and other design considerations. The alternatives evaluated were selected based on continued discussions and coordination with the United States Fish and Wildlife Service's (USFWS) Humboldt Bay National Wildlife Refuge (HBNWR) staff and Caltrans, and include: 1) full tidal salt marsh/mudflat restoration, including low and high fill options; 2) muted tidal salt marsh/mudflat restoration; and 3) freshwater non-tidal wetland restoration. All three restoration concepts include protection and potential enhancement of the high-quality forested freshwater wetland occurring along the western boundary of the site. This report also summarizes existing and historical site conditions as they pertain to restoration project design.



Source: AECOM 2015

Figure 1-1. Project and Reference Site Location

Chapter 2. Existing Site Conditions

2.1. Site Overview

The project site is located on a parcel of previously reclaimed tidal lands (Lanphere parcel) adjacent to MRS in north Humboldt Bay (Figure 1-1), and is roughly bounded by Lanphere Road on the north and west sides, an earthen levee and MRS on the east side, and the parcel boundary between the Lanphere parcel and the Ralph property on the south side. The USFWS Lanphere Dunes Unit of the HBNWR flanks the project site to the west.

The majority of the project site is low-lying flat pasturelands, but also includes an area of freshwater marsh that is infrequently grazed in the northeast corner, a ribbon of high-quality forested wetland habitat along the western edge, and a small remnant sand dune. Where Lanphere Road runs along the western edge of the project site, it generally marks the transitional boundary between the forested wetland fringe (on the east side of the road) and the upland dune forest (on the west side of the road) and marks the western boundary of project activities on maps contained in this report.

2.2. Vegetation

The majority of the acreage at the project site consists of a mosaic of upland and grazed wetland pasture, which has been managed for forage production and/or grazing since the site was leveed and reclaimed from tidelands (likely in the 1930s, see Chapter 3). The project site includes 16.3 acres of delineated uplands, not including the outboard levee but including approximately 1 acre of relic dune (per supplemental wetland delineation studies performed by Caltrans in January 2010 and verified by the United States Army Corps of Engineers (USACE) on March 23, 2010 and reverified on April 23, 2015). The wetter portions of the grazed agricultural wetlands are dominated by pacific rush (*Juncus effusus* var. *pacificus*), silverweed (*Potentilla anserina*), and creeping buttercup (*Ranunculus repens*). Dense-flowered cordgrass (*Spartina densiflora*), referred to throughout this document as *Spartina*, was observed in some wet areas of the project site adjacent to drainage ditches. In the drier pasturelands and upland/wetland mosaic grassland, the dominant plant species are nonnative (and likely historically seeded) pasture grasses and forbs, particularly meadow foxtail (*Alopecurus pratensis*), tall fescue (*Festuca arundinacea*), common velvetgrass (*Holcus lanatus*), and Kentucky bluegrass (*Poa pratensis*). Patches of native California blackberry (*Rubus ursinus*) thickets are present in the open pasture, particularly alongside drainage ditches. A few large and

spreading patches of the invasive Himalayan blackberry (*Rubus armeniacus*) also are present on-site, primarily out in the open pasture and also near the trailhead parking area on the west side of the project area on Lanphere Road.

A seasonal freshwater marsh is present in the northwest portion of the site, and is vegetated by panicled bulrush (*Scirpus microcarpus*), water parsley (*Oenanthe sarmentosa*), pale spikerush (*Eleocharis macrostachya*), Bolander's rush (*Juncus bolanderi*), and seep monkeyflower (*Mimulus guttatus*). USFWS reports that invasive reed canarygrass (*Phalaris arundinacea*) has been increasing in abundance in this area for some time, and cattail has appeared in the last few years and is increasing.

The MRS levee is vegetated with California blackberry thickets, along with coyote bush (*Baccharis pilularis*), pink-flowering currant (*Ribes sanguineum* var. *glutinosum*), sword fern (*Polystichum munitum*) and occasional individuals of the nonnative invasive French broom (*Genista monspessulana*). Some sections along the landside toe of the levee are dominated by saltgrass. Saltgrass also surrounds the margins of the shallow brackish pond located just west of the leaky flap gate in the levee.

The western edge of the project site is fringed with a dense forested wetland/riparian swamp, dominated by Hooker's willow (*Salix hookeriana*) and red alder (*Alnus rubra*). These forested wetlands (as well as forested areas fringing the reference site) were classified and mapped to vegetation alliance and/or association by AECOM following A Manual of California Vegetation (Sawyer et al. 2009) as detailed in Attachment C. The most predominant vegetation alliance in the forested wetland fringe falls in the coastal dune willow thickets (*Salix hookeriana*) alliance, dominated by Hooker's willow (*Salix hookeriana*), with red alder (*Alnus rubra*), California blackberry (*Rubus ursinus*), wax myrtle (*Morella californica*), and Sitka spruce (*Picea sitchensis*) commonly co-occurring. In addition to California blackberry, understory plant species occurring within this vegetation alliance at the project site include poison oak (*Toxicodendron diversilobum*), sword fern (*Polystichum munitum*), wild cucumber (*Marah oregana*), cascara (*Frangula purshiana*), elderberry (*Sambucus racemosa*), silverweed (*Potentilla anserina*), and localized patches of the invasive Himalayan blackberry (*Rubus armeniacus*) and native salmonberry (*Rubus spectabilis*). Red alder becomes more dominant in the southwestern portion of the project site, particularly west and south of the remnant sand dune, where red alder (*Alnus rubra*) forest alliance occurs in greater prevalence. The understory of these areas is similar to that found in the coast dune willow thicket alliance at the project site. California blackberry thickets extend from the forested wetland into the adjacent pasture, particularly in the southern portion of the site. Furthermore, a small segment of

the wetland forest along Lanphere Road in the northwestern portion of the site was mapped as wax myrtle scrub (*Morella californica* [=*Myrica californica*]) shrubland alliance, and a second small patch of this vegetation type occurs near the horse corral in the southern end of the site.

The forested wetland transitions to upland dune forest along the western boundary of the project site, with the breakpoint typically occurring near Lanphere Road. The dune forest located north and west of Lanphere Road falls in the beach pine (*Pinus contorta* ssp. *contorta*) forest alliance which at this site is generally dominated by beach pine in the overstory with Sitka spruce (*Picea sitchensis*) also prevalent. This alliance is also characterized by a unique and diverse native understory including wax myrtle, huckleberry (*Vaccinium ovatum*), sword fern, and salal (*Gaultheria shallon*).

East of Lanphere Road, about midway down the project site, a remnant sand dune is surrounded by forested wetland on three sides and by open pasture on the east side. The sand mound is vegetated with annual grassland, dominated by ripgut brome (*Bromus diandrus*), with chickweed (*Stellaria media*), miniature lupine (*Lupinus bicolor*), and miner's lettuce (*Claytonia perfoliata*) subdominant, and a lone Sitka spruce on the northern flank.

2.3. Hydrology

Freshwater runoff and shallow groundwater seepage from the dunes and incomplete site drainage to MRS have sustained the dense forested wetland/riparian swamp corridor along the west side of the project site, the freshwater marsh, and the wet meadow further east.

Four culverts under the north–south section of Lanphere Road maintain at least partial hydrologic connectivity between the dunes to the west and the project site. The site then is drained by a network of drainage ditches that primarily are oriented north–south and east–west. Some of the ditches are heavily vegetated with tule (*Schoenoplectus acutus*) and cattails (*Typha latifolia*), which impedes drainage. A small culvert with a tidal flap gate in poor condition is located approximately at the midpoint of the levee; water from the ditches drains through this culvert into MRS at low tide. The flap gate appears to leak during high tide cycles, and this allows salt water from MRS to enter the low-lying portions of the site; the shallow ponded area just southwest of the flap gate appears to fill with brackish water, and the margins of this inundated area are colonized almost exclusively by saltgrass (*Distichlis spicata*), a salt-tolerant plant species that is not prevalent in most other areas of the site except some areas along the landside levee toe

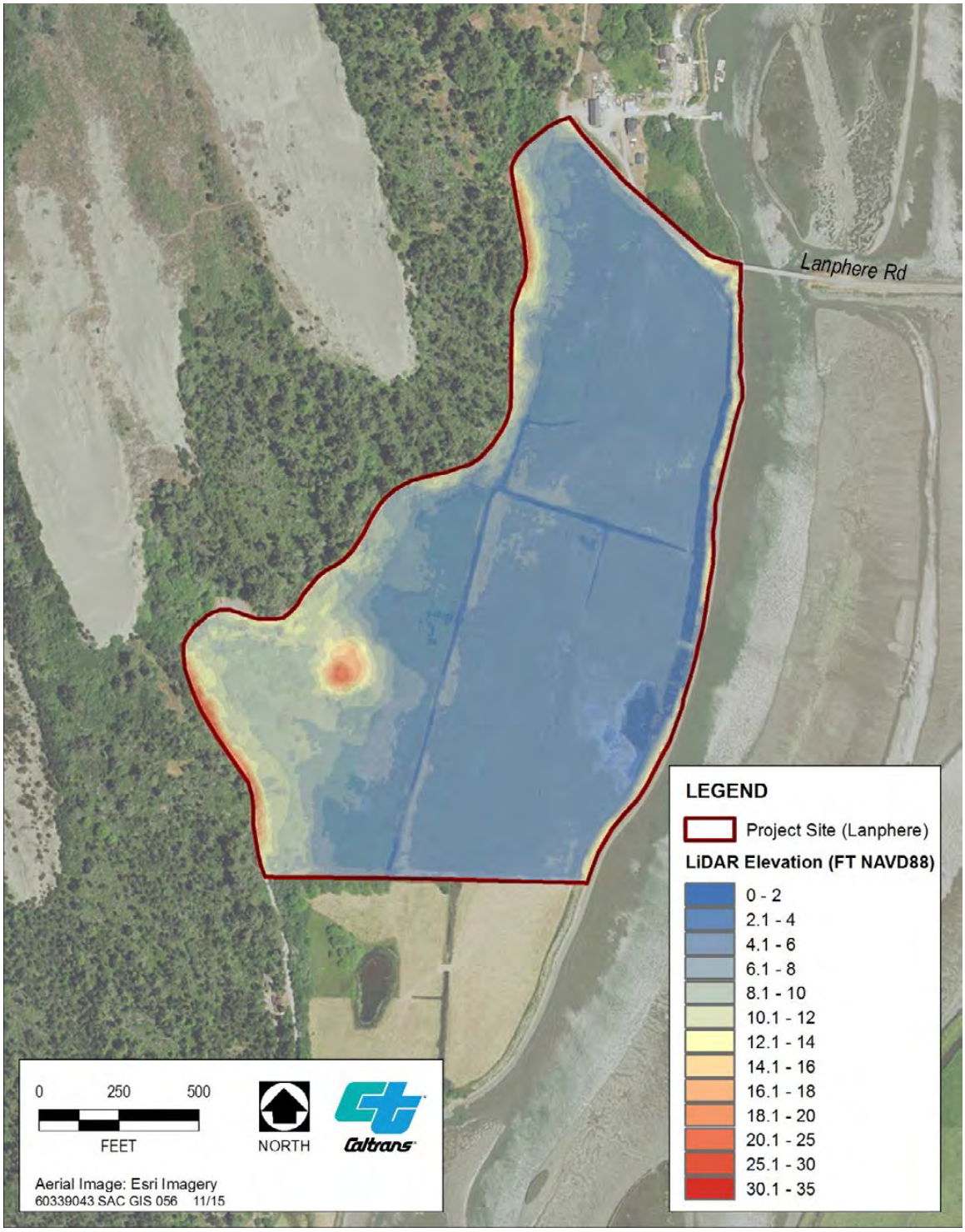
where under-seepage may be occurring. The drainage ditch network on the Lanphere parcel and the drainage network on the Ralph parcel to the south also are connected hydrologically via a north–south oriented culvert at the boundary between the parcels. The Ralph parcel drainage ditches also ultimately drain to MRS via a tide gate through the outboard levee, approximately 700 feet south of the Lanphere southern boundary.

Much of the site was classified as wetland or wetland/upland mosaic, per a wetlands delineation performed by Caltrans (Caltrans 2009), and has areas of mostly shallow ponding and saturated soils throughout the dry season, suggesting that the existing drainage network does not effectively drain all portions of the site.

2.4. Site Topography

AECOM conducted preliminary land-based Real-time Kinematic Global Positioning System topographic surveys at the project and reference sites to supplement and verify the existing 1-meter digital elevation model (DEM), derived from topographic light detection and ranging (LiDAR) data from the National Oceanic and Atmospheric Administration (NOAA). The methods and results of those efforts are detailed in the Topographic and Vegetation Survey and Hydrologic Monitoring Report (Attachment C). In general, the ground surface elevation points compared favorably to the LiDAR data in most areas with herbaceous vegetation cover types, with only small elevation biases (0.0 to +0.1 feet) evident in much of the project site. However, slightly greater bias (+1 to +2 feet) exists in the northwest freshwater marsh portion of the project site, and substantially less accuracy in areas with ponded water (e.g., drainage ditches) and within forested and blackberry thicket habitat types on the western boundary and along the MRS levee. Figure 2-1 shows an adjusted LiDAR-based DEM of site elevations after applying spatially variable correction factors to account for biases in the freshwater marsh and pasture areas of the site, based on spot elevation survey results.

Table 2-1 summarizes typical elevations for key topographic features in the project and reference sites. The majority of the project site is relatively flat and low-lying, at an elevation of approximately 2 to 4 feet North American Vertical Datum of 1988 (NAVD88). Most of the site interior lies below Mean Higher High Water (MHHW, 7.05 feet NAVD88) and would be inundated regularly by daily high tides were it not for the presence of the existing outboard levee. The drainage ditches that cross the site range in depth from approximately 1 to 5 feet relative to the surrounding ground elevation (with ditch bottoms typically -1 to 1 foot NAVD88 elevation). The ponded area in the eastern portion of the pasture is shallow, with bed elevations of approximately 1 to 2 feet NAVD88. Surveys along the forested wetland canopy boundary demonstrated



Notes: elevations from an adjusted LiDAR-based DEM of site elevations after applying correction factors to account for biases in the freshwater marsh and pasture areas of the site, based on spot elevation survey results. No correction factors have been applied to forested or inundated areas.
Source: NOAA 2009-2011, data compiled and adjusted by AECOM in 2015

Figure 2-1. Project Site Topography

Table 2-1. Summary of Typical Elevations at Project Site	
Topographic Feature	**Typical Elevation (feet NAVD88)**
Pasture/Freshwater Marsh	2 to 4
Drainage Ditches	-1 to 1
Ponded Areas	1 to 2
Levee Borrow Ditch	-1 to 0
Forested Wetland Canopy Boundary	3 to 9
Lanphere Road	8 to 21
Levee Crest	10.5 to 13
Reference Site Marsh Plain	6 to 7
Notes: MHHW is 7.05 feet and MLLW is -1.15 feet North American Vertical Datum of 1988 (NAVD88) Typical elevations are approximate and for reference only; see Attachment C for more precise elevations by location. Source: AECOM 2015	

considerable variability in elevation along the lower canopy dripline and ranged from 4 to 9 feet NAVD88. Although Lanphere Road was found to be relatively high in some locations (up to 21 feet NAVD88), multiple segments of roadway with low-lying ground elevation were on the order of 8 feet NAVD88. The lowest segment of Lanphere Road is in the far northwest corner of the project site, at elevation 7 feet NAVD88.

2.5. Tidal Elevations

AECOM conducted hydrologic monitoring within MRS to characterize tidal variations at the project site. A water level sensor was deployed at the Lanphere Road Bridge from March 17, 2015 to June 1, 2015, which collected water levels for 76 days in 10-minute intervals. These data were used to derive estimates of tidal datums and extreme tides at the project site. Tidal datums were calculated using NOAA's Computational Techniques for Tidal Datums Handbook (NOAA 2003). AECOM used NOAA's standard method, which develops adjustment factors at the measurement site using coincident measurements at a long-term tide station. For the purposes of this study, coincident measurements at NOAA's Humboldt Bay North Spit tide station (#9418767) were used to adjust the observed short-term tidal datums at the project site, to be representative of long-term tidal datums. The data collections and datum analysis was conducted relative to NAVD88. Table 2-2 shows the results of the tidal datum analysis relative to the NAVD88 and Mean Lower Low Water (MLLW) datums. Comparison of the calculated tidal datums at the project site with tidal datums provided by prior studies shows that the tidal range is amplified with increasing distance from the Humboldt Bay entrance. The MLLW and MHHW levels are lower and higher, respectively, than the levels recorded at the entrance to MRS (approximately 2.5 miles south of the Lanphere Road bridge), which results in a larger tidal range at the Lanphere parcel.

Table 2-2. Tidal Datums at Project Site

Datum	MLLW	MLW	MTL	MHW	MHHW	Range
feet NAVD88	-1.15	0.10	3.21	6.33	7.05	8.20
feet MLLW	0.0	1.25	4.36	7.48	8.2	8.20

Notes:
MLLW = Mean Lower Low Water; MLW = Mean Low Water; MTL = Mean Tide Level; MHW = Mean High Water; MHHW = Mean Higher High Water; NAVD88 = North American Vertical Datum of 1988.
Source: AECOM 2015

Extreme high tides were estimated by leveraging work completed as part of the Federal Emergency Management Agency's (FEMA) California Coastal Analysis and Mapping Project, Open Pacific Coast study for Humboldt County (BakerAECOM 2013). An extreme tide frequency analysis was conducted for Humboldt Bay to determine extreme tide elevations for various return periods at the Humboldt North Spit and Mad River Slough Entrance tide stations. Using the results of the tidal datum analysis at the project site, the extreme tide estimates from FEMA were adjusted to account for tidal amplification within Mad River Slough, and to develop estimates of extreme tides at the project site. The extreme tide elevations are shown in Table 2-3. The methods and results of the hydrologic monitoring and analysis are further detailed in the Topographic and Vegetation Survey and Hydrologic Monitoring Report (Attachment C).

Table 2-3. Extreme Tide Elevations at Project Site

Extreme Tide Elevation at Mad River Slough (Percent annual chance of occurrence/return period) (feet NAVD88)						
50-percent (2-year)	20-percent (5-year)	10-percent (10-year)	4-percent (25-year)	2-percent (50-year)	1-percent (100-year)	0.2-percent (500-year)
9.5	9.9	10.2	10.5	10.8	11.1	11.9

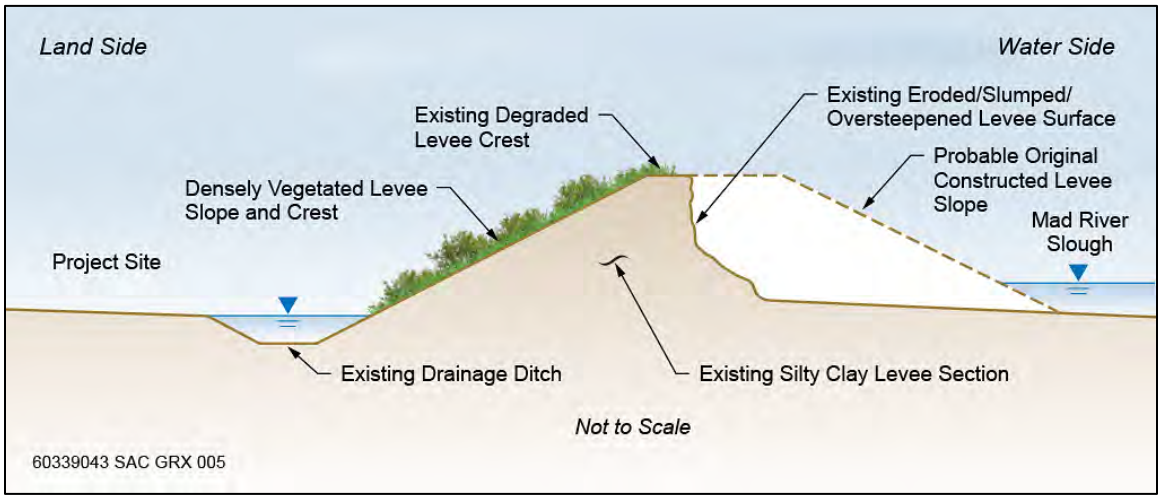
Source: BakerAECOM 2013

2.6. Soils

The Natural Resource Conservation Service classifies soils at the project site as Arlynda, 0-2 percent slopes, derived from alluvium from mixed sources, and typically associated with depressions, meander scars, backswamp and floodplain step landform types (NRCS 2015). Minor soil components present include Worswick, Loleta, and Occidental soil types, which are associated with flood plain steps, alluvial fans, and tidal marshes and depressions. The soil profile is described as having a shallow (0 to 3 inches) peat layer over silty clay loam in the A and B horizons. This soil type is mapped in other sites near MRS and Humboldt Bay that also historically supported tidal marsh and mudflat habitat. Soils at the project site should be suitable for both tidal salt marsh restoration and freshwater wetland restoration.

2.7. Mad River Slough Levee Evaluation

AECOM conducted a preliminary geotechnical evaluation of the existing condition of the project site levee along MRS (Attachment B). The MRS levee currently protects both the project site and the adjoining privately owned Ralph parcel to the south from the tidal influence of MRS, and has undergone long-term progressive waterside erosion, slumping, and over-steepening, which has resulted in the loss of a significant portion of the waterside and original levee crest cross-section. The levee is considered to be in unacceptable condition to preclude breaching, with a relatively high extant risk of breaching or overtopping at any time in the near future. Figure 2-2 shows a typical levee cross-section of the probable original levee and current existing relative conditions along the Lanphere levee reach.



Source: AECOM 2015

Figure 2-2. Existing Levee Section

As mentioned previously, the MRS levee crest and landside slope is densely vegetated with primarily native shrub and thicket-forming species, including California blackberry, coyote brush, sword fern, and pink-flowering currant. During site topographic surveys, survey access to the levee crest was difficult because of dense vegetation cover, but spot checks along the crest of the levee indicated crest elevations from 10.5 to 13 feet NAVD88, indicating that at least some portions of the levee could be susceptible to overtopping during a 25-year or greater extreme tide event.

If the levee remains in place to protect the project site and Ralph property from tidal inundation (e.g., under a no project, muted tidal, or freshwater wetland restoration alternative), it would require substantial reinforcement, as discussed further in Chapter 4.

Enhancements to improve short-term stability and construction of an east-west cross levee at the Ralph parcel boundary are recommended to protect the Ralph parcel from tidal inundation under any alternative (Attachment B).

2.8. Tidal Marsh Reference Site

2.8.1. Site Overview

A tidal marsh reference site, located between MRS and the Ma-le'l and Lanphere Dunes Units of the HBNWR, approximately 0.6 mile south of the project site, was identified by Caltrans and USFWS as an appropriate reference for the project site under the full tidal restoration alternative (Figure 1-1). The reference site contains intact tidal marsh, bordered by coniferous dune forest and patches of forested wetland. The site was selected as locally representative of a natural transitional habitat from dune forest and forested wetland to tidal wetland, and was surveyed in support of the project concept design (see Attachments A and C).

The salt marsh is dissected by two primary tidal channels and a number of secondary channels; one of the primary tidal channels also is the outlet of a freshwater creek originating in the Lanphere Dunes to the west. On the east side, the reference site is bordered almost entirely by a low levee or berm (and an adjacent landside ditch) along MRS, but the levee/berm is completely open and unimpeded at the mouth of the primary tidal channel inlet and associated freshwater creek outlet.

2.8.2. Vegetation

The tidal salt marsh at the reference site is dominated by saltgrass and common pickleweed (*Salicornia pacifica*), with marsh jaumea (*Jaumea carnosa*) also prevalent in some locations (salt grass flats (*Distichlis spicata*) and pickleweed mats (*Sarcocornia pacifica*) herbaceous vegetation alliances, Sawyer et al. 2009). The rare Humboldt Bay owl's clover (*Castilleja ambigua* ssp. *humboldtiensis*; California Rare Plant Rank 1B.2) grows in a patchy distribution within the upper elevations of the salt marsh. Between the forest and the salt marsh plain, a narrow band of brackish marsh supports a diversity of species including Lyngbye's sedge (*Carex lyngbyei*; California Rare Plant Rank 2B.2), seaside arrowgrass (*Triglochin maritima*), and Humboldt Bay owl's clover. The forest surrounding the marsh where the dune complex and marsh plain intersect primarily is dominated by wax myrtle, shore pine, and/or Sitka spruce, with the diverse assemblage of understory species typical of nearby dune forests as observed at the project site. Mapped vegetation alliances/associations for the forested portions of the reference site are discussed further in Attachment C. The most prevalent woody species growing adjacent to the salt marsh/brackish marsh fringe of the reference site include wax myrtle, beach

pine, and Sitka spruce. Much of the forest adjacent to the reference site marsh plain and brackish marsh fringe is drier upland dune forest of the beach pine forest alliance.

Within wetter and lower areas, the wax myrtle scrub (*Morella californica*) alliance was prevalent, with greater than 50 percent relative cover by wax myrtle in the shrub canopy (Sawyer et al. 2009). California blackberry is fairly common in the understory, and Hooker's willow and red alder were subdominant to wax myrtle at specific locations. Pockets of Hooker's willow and red alder grow in areas that seem to have greater freshwater influence from the dunes, where brackish marsh transitions to freshwater swamp, particularly in the central portion of the reference site. With the exception of the Hooker's willow and red alder pockets, the forest fringe of the reference site differs substantially in species composition from the forest areas on the western edge of the project site, which is adjacent to pastureland rather than marsh plain. The forest fringe of the project site and reference site differ in species dominance patterns and prevalence of vegetation alliances (Attachment C). Hooker's willow and red alder alliances are significantly more prevalent in the project site's forested wetland than at the reference site, while the reference site is characterized by dominance of wax myrtle and beach pine alliances near the salt marsh. However, all of the three dominant forested wetland tree/shrub species at the project site (i.e., Hooker's willow, red alder, and wax myrtle) were encountered at low fringing elevations adjacent to the brackish marsh of the reference site, indicating that these species can survive in relatively close proximity to salt marsh as long as freshwater inputs exist, such as from a freshwater creek or from seepage of shallow groundwater originating in the adjacent dunes.

2.8.3. Site Topography

The reference site also was surveyed by AECOM, and the surveyed elevations compared with LiDAR data (Attachment C). In general, the LiDAR showed approximately +0.3 to +0.5 feet relative to the ground survey in densely vegetated portions of the marsh plain. Surveys on the marsh plain indicate typical elevations of approximately 6 to 7 feet NAVD88.

From spot elevations surveyed along the forested wetland canopy boundary at the project and reference sites, the forested wetland boundary of the project site extends to a lower elevation (as low as 1.8 feet NAVD88) than at the reference site (approximately 6.7 feet NAVD88). These elevational differences relate to the different prevalence patterns and observed differences in plant species dominance of the forested wetlands between the project and reference sites. All of the three primary dominant species observed at the project site (i.e., Hooker's willow, red alder, and wax myrtle) persist to some extent in the

transitional elevation zone directly above the brackish marsh fringe at the reference site. However, these species do not persist below the MHHW tidal elevation at the reference site. A substantial amount of the forested wetland that currently occurs at the project site is below the average daily high tide level, with some portions below mean tide level (see Figures 2-1 and 3-2 in Attachment C). Therefore, much of the forested wetland vegetation is expected to be affected by or converted to a different vegetation type if the project site levee is breached with no other modifications to attenuate or restrict interior tidal saltwater levels.

2.8.4. Tidal Elevations

Water surface elevation measurements taken during high tide within the reference site are nearly equal in magnitude to high tides within MRS, indicating that no muting of high tides occurs at the reference site, despite the presence of the surrounding remnant historical levee/berm. The breaches and low berm crests allow full tidal influence (at least for the stage of tide observed at the time of the survey). This finding is consistent with the calculated tidal datums at the Lanphere Road Bridge (north of the reference site near the project site) and the MRS north site (south of the reference site), both of which show very similar estimates of the Mean High Water (MHW) and MHHW tidal datums.

2.8.5. Soils

The reference site soils are mapped as Fluvaquents-Riverwash complex, 0 to 2 percent slopes, which are associated with overflow stream channels and meandering channels, deriving from alluvium material from mixed sources (NRCS 2015). The riverwash is made up of extremely gravelly sand, while Fluvaquents are similar to the Arlynda soils mapped on the project site, with a thin peat layer in the O horizon, and overlaying silty clay loam in the A and B horizons.

Chapter 3. Historical Site Conditions

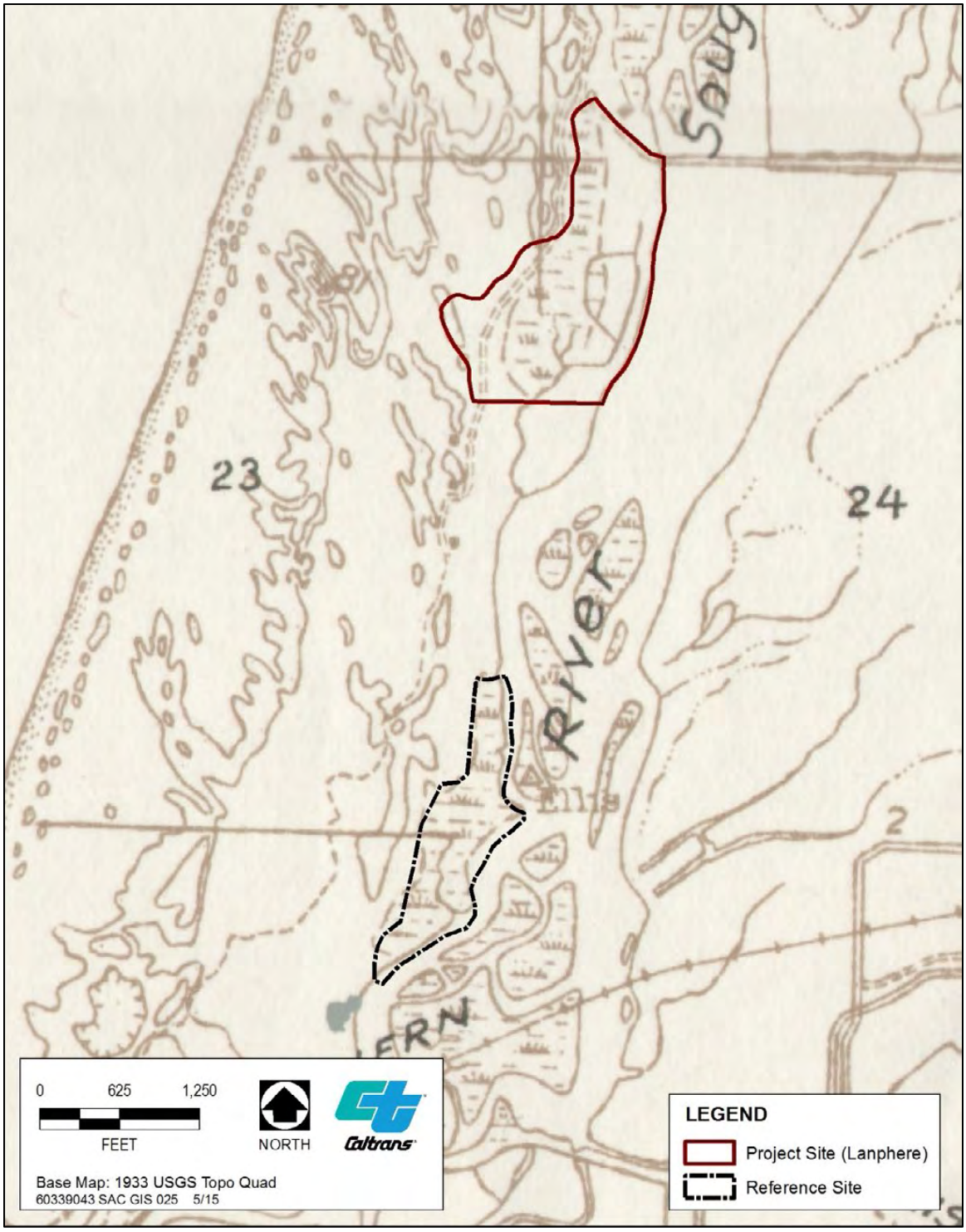
AECOM reviewed available historical aerial photo imagery and maps from various sources to understand the historical conditions of the project and reference sites and to assess changes that have occurred at these sites over time (see Attachment A). As evidenced by the pre-levee imagery, the project site was an extension of the tidal marsh, mudflat, and slough pattern found throughout the perimeter of Arcata Bay, and in particular within and along MRS. The approximate distribution of salt marsh at the project site as mapped in 1870 by the United States Coast and Geodetic Survey and digitized in the Historical Atlas of Humboldt Bay and Eel River Delta (Laird 2007) is shown in Figure 3-1. At the time salt marsh distribution throughout the region was extensive from beyond the northern and southern boundaries of the project site, it spanned the entire width of the project site in the far northern end and occurred in central portions of the project site moving further south (Figure 3-1). The eastern (unpatterned) portion of the site adjacent to MRS was presumably occupied by mudflat and tidal channels, while the far western portion likely was forested wetland and dune forest, similar to what exists at the reference site today. These suppositions are supported by later imagery, as described next.

The levee likely was constructed in the mid-1930s and before 1939. As of 1933, the levees west of MRS had not been constructed or had not been recorded by the United States Geological Survey (USGS) in the quadrangle map update. In 1933, the project site was mapped with a dashed line, assumed to represent an uncertain boundary that separates the west side of the site (shown as marsh) from the east side (shown as unvegetated tideland, with no pattern), with a tidal channel running north to south across most of the site (Figure 3-2). Prior to construction of a levee system to reclaim tidelands for agriculture, the project and reference sites supported tidal mudflats, salt marsh, open water and secondary soughs with forested fringe along the western edge of the sites.

High resolution aerial photography taken in 1939 as part of a photo transect clearly shows the perimeter levee constructed at the project site, but the site appears to be in an incomplete state of reclamation to agricultural use (Figure 3-3). The incomplete state of reclamation and the absence of typical livestock trails in the 1939 photo suggest that the levee may have been constructed closer to the mid-1930s. The drainage outlets present in the imagery correspond to the locations of the present day drainage structures (Figure 3-4), one at the southeast side of the project site, 800 feet north of the south boundary, and

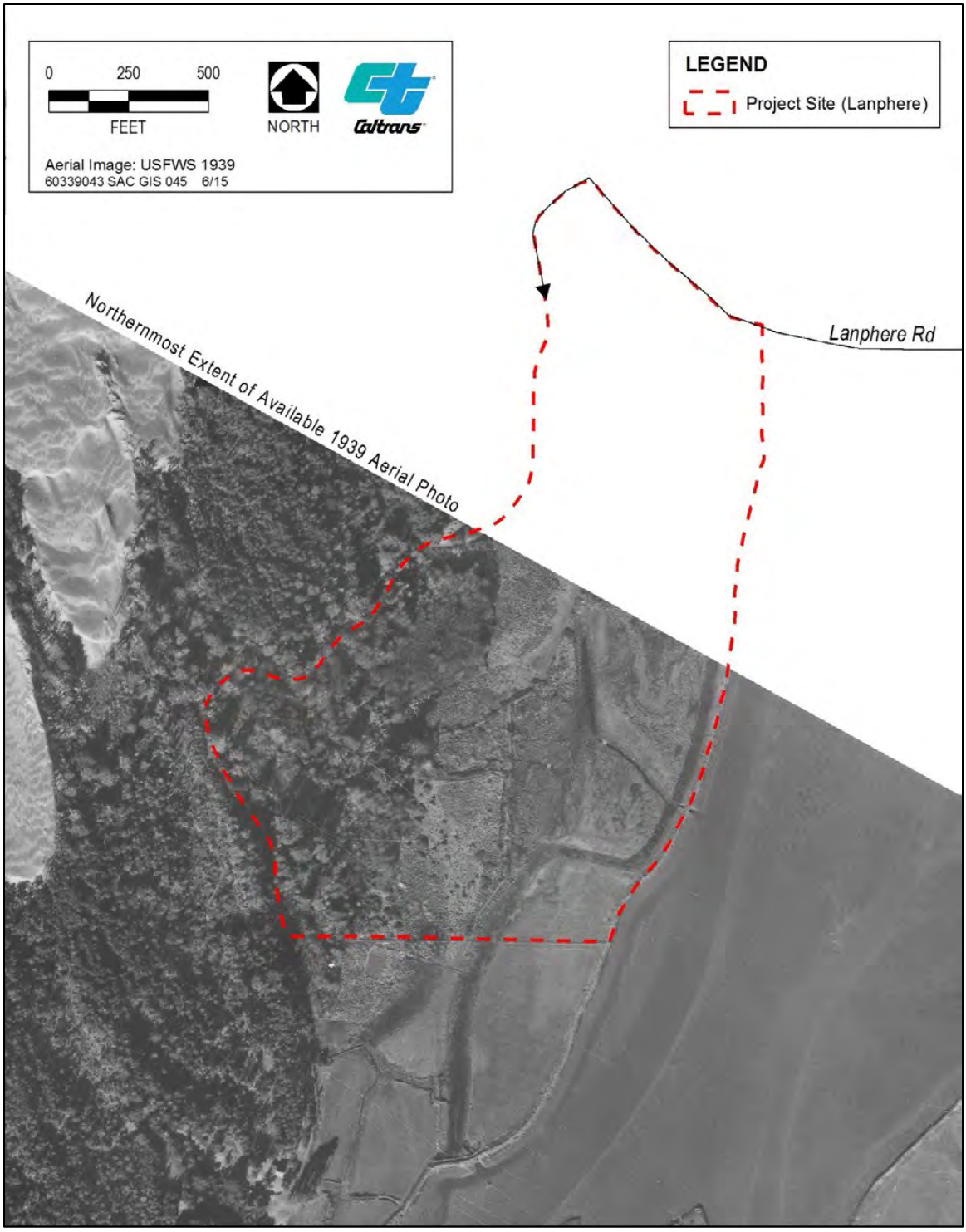
Source: Historical Atlas of Humboldt Bay and Eel River Delta

Figure 3-1. Historical Salt Marsh Distribution at Project Site



Source: Historical Atlas of Humboldt Bay and Eel River Delta

Figure 3-2. 1933 USGS Quad for Eureka, CA



Source: USFWS 1939

Figure 3-3. 1939 Aerial Photo of Project Site

Source: Google Earth Pro, June 2011

Figure 3-4. 2011 Aerial Photo of Project Site at Low Tide

the other 700 feet south of the south boundary (on the Ralph property). Despite the construction of the secondary drainage and irrigation ditches, the historic tidal channel still was present and partially water-filled, although the channel alignment had been slightly altered. In 1939, the main north–south drainage ditch had not been constructed, the southwest portion was densely wooded, including the present day treeless sand mound, and dense herbaceous cover occupied the eastern area of the interior. The wooded area appears to have been a mixture of tall trees closer to Lanphere Road, possibly mixed conifer woodland, and a more finely textured, lower stature riparian scrub situated between the tall woodland and the herbaceous areas. Mostly unvegetated flats were present between the historic slough and the levee. The 1939 photographs were taken at low tide, and thus how much of the project site interior and adjacent land would have been inundated or saturated at higher tides is unclear.

In the 1948 aerial photographs (Attachment A), the land between the new levee and the north–south ditch appears to have been leveled or graded for agricultural use. A soil-type signature on the landscape is clearly visible and corresponds to the identical pattern of the tidal channel, as shown in both the 1933 and 1942 USGS maps. The apex of the 180-degree, P-shaped bend in the historical channel's signature abuts the levee in the same location as the present-day tide flap gate, and circumscribes the muted tidal brackish pond in the east central area of the site.

Although the project site has undergone many significant alterations, the tidal marsh reference site has remained fairly stable and unaltered since 1939. The levee at the reference site is present in the 1939 and 1948 imagery, but in 1939, it already had been breached in the middle at the location of the existing main tidal inlet (see Appendix B8 of the Site Reconnaissance and Data Review Report, in Attachment A). The reference site has remained in its natural state of forested woodland, marshland, secondary sloughs, and open water or tidal mudflat, as shown in the 1933 USGS topographic map. Review of subsequent aerial photographs also reveals that the split tidal channel pattern within the marsh of the reference site did not change substantially between 1939 and the present.

Chapter 4. Restoration Design Alternatives

The three wetland restoration concepts being considered for the site are summarized below and then are discussed in more detail in subsequent sections.

Full Tidal Alternative. The full tidal restoration alternative would allow unrestricted tidal flow into an approximately 30-acre portion of the Lanphere parcel. The existing outboard levee would be breached, and a channel network would be excavated within the existing pasture area to achieve a tidal regime that matches that of MRS. A new setback levee would be constructed east of the existing, forested wetland, to prevent saltwater impacts on the existing forested freshwater wetland habitat and prevent inundation and flooding of the adjacent Ralph parcel to the south. The full tidal restoration alternative would likely involve placement of fill to raise site elevations to a suitable level for vegetation colonization.

Muted Tidal Alternative. The muted tidal restoration alternative would rehabilitate the existing outboard levee and would install an inlet/outlet water control structure to create a muted tide range within the site[1]. Similar to the full tidal restoration alternative, an earthen berm would be constructed along the back of the site, to separate the saltwater marsh from the forested wetland and freshwater wetland. The muted tidal restoration alternative would require minimal fill because the water control structure would create a tidal regime that would be compatible with existing site elevations.

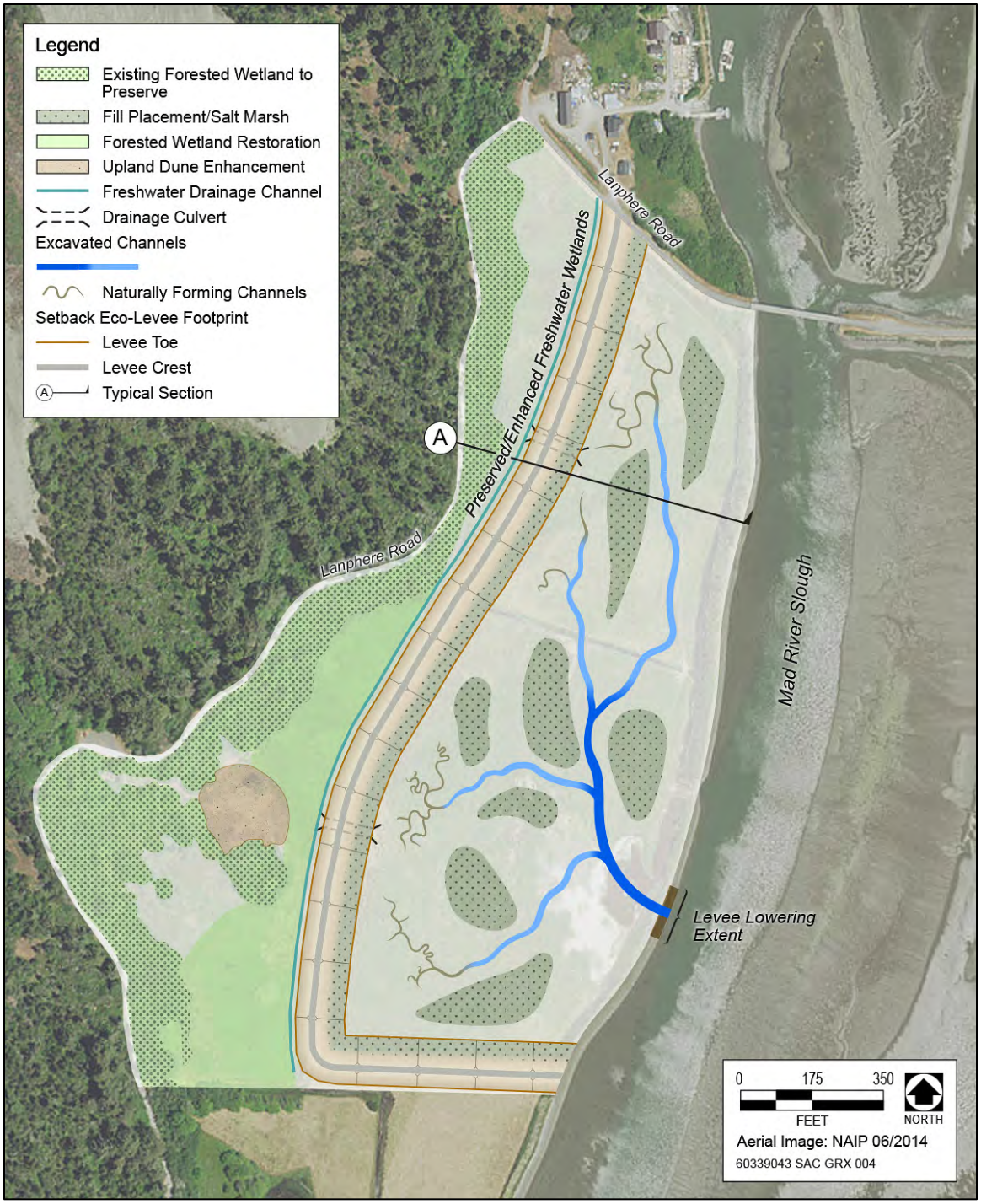
Freshwater Non-Tidal Alternative. The freshwater wetland restoration alternative would rehabilitate the existing outboard levee and would enhance/establish forested wetland and freshwater marsh within the existing wet meadow and pasture areas. Accumulated freshwater at the project site (from precipitation and groundwater seepage) would drain to MRS via water control structures in the MRS outboard levee.

4.1. Full Tidal Alternative

4.1.1. Conceptual Restoration Plan

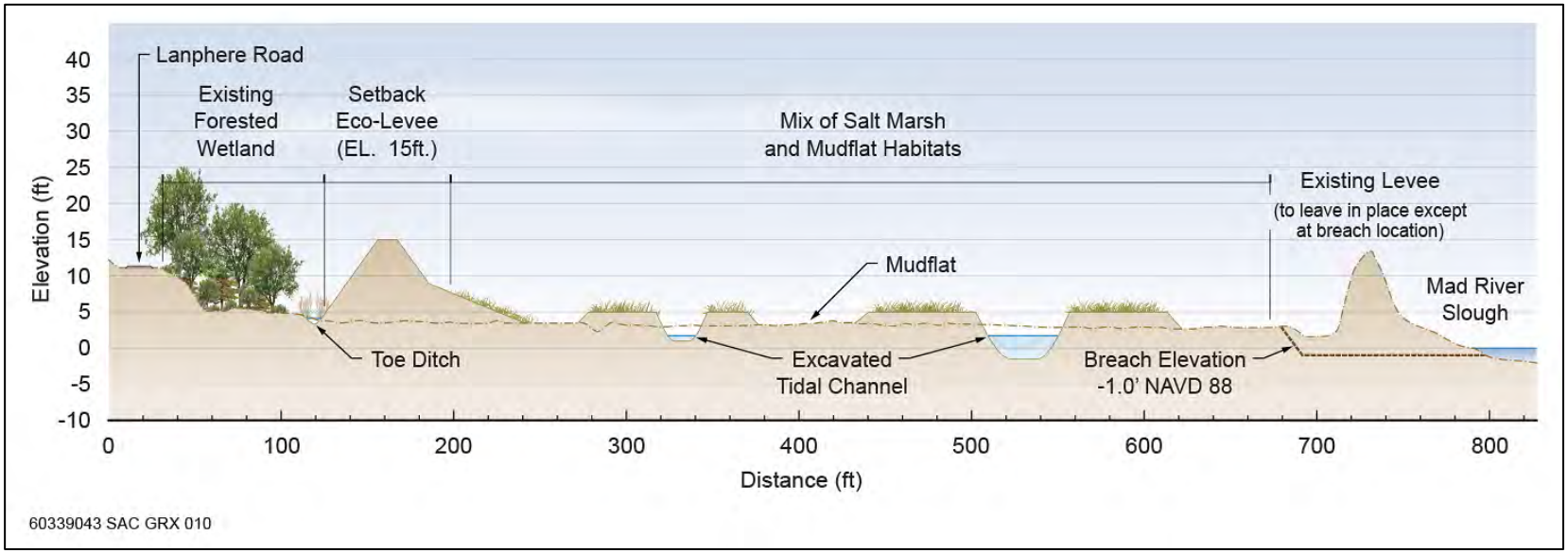
The conceptual restoration plan for the full tidal marsh and preservation, enhancement and expansion of freshwater riparian forest is shown in Figures 4-1 and 4-2. The

[1] A “muted” tide range is characterized by a tidal environment in which the high tides are lower and the low tides are higher than the adjacent natural tidal environment, thereby producing a smaller tide range within the restored area.



Source: AECOM 2015

Figure 4-1. Conceptual Restoration Plan Layout – Full Tidal Alternative



Source: AECOM 2015

Figure 4-2. Conceptual Restoration Plan Cross Section – Full Tidal Alternative

conceptual restoration plan includes breaching and lowering a portion of the existing levee, excavating a pilot channel to connect the restoration site to MRS, excavating a starter tidal channel network within the restored site, constructing a setback levee along the southern and western boundaries of the restored site, installing a freshwater drainage system (i.e., drainage ditch and culverts) to connect the forested wetland and the tidal wetland, filling the existing drainage ditch network, and selectively placing fill to raise site elevations and promote early saltmarsh vegetation establishment.

4.1.2. Restoration Design Elements

The restoration design elements for the full tidal marsh and preserved and expanded freshwater riparian forest alternative are described next.

Levee breach and lowering. The existing outboard levee along MRS would be breached at a location approximately 300 feet south of the existing drainage culvert. This location was selected because it is relatively low-lying and the site naturally drains to it. The breach would be excavated to an elevation of -1.0 feet NAVD88, with a breach top width of approximately 55 feet. The existing outboard levee along a 100-foot-length to the north and south of the breach also would be lowered, from approximately 11.5 feet to 7.0 feet NAVD88, to create vegetated marsh habitat along the existing levee footprint and promote unencumbered tidal exchange between the Lanphere parcel and MRS. The remainder of the existing levee would remain intact, to act as a wave break, and gradually would erode naturally over time (see Section 4.1.5).

Pilot channel. A pilot channel would be excavated from the levee breach through the mudflat to connect the Lanphere parcel to the main channel of MRS. The pilot channel would be excavated to an elevation of -1.0 feet NAVD88, with a top width of 24 feet.

Starter channels. An interior tidal channel network would be excavated within the Lanphere parcel. The Lanphere parcel would support a 5th-order tidal channel network,[2] based on the marsh area and comparison with empirical data from the reference site and other California salt marsh sites (see Section 4.1.3). The conceptual design proposes to excavate the 5th and 4th-order tidal channels only and allow the lower order channels to develop naturally over time.

Setback levee. A new 2,800-foot setback eco-levee would be constructed along the southern and western boundary of the restoration area, to provide flood protection to the

[2] See Philip Williams and Associates and Faber (1995) for a description of the tidal channel order classification system.

adjacent Ralph parcel, forested wetland, and Lanphere Road. The eco-levee would be constructed to an elevation of 15 feet NAVD88, with a top width of 12 feet. The eco-levee height relative to existing grade would be approximately 11 feet. The proposed crest elevation would provide 2 feet of freeboard above the 100-year tide level and would accommodate 19 inches of sea level rise over the 50-year planning horizon to 2070. The setback eco-levee would have a 3:1 (H:V) side slope between the 15-foot and 9-foot NAVD88 elevation, and a 10:1 (H:V) side slope from 9 feet NAVD88 to the intersection with the existing grade (approximately 3.5 feet NAVD88) (Figure 4-3). This would provide a gradual slope approximately 50 to 60 feet wide and would create approximately 2.5 acres of transitional salt marsh habitat area along the back of the site. The levee should be constructed of a low permeability material, such as clay, to prevent uncontrolled through-seepage, internal erosion, and piping, as discussed further under Section 4.1.5, "Design Considerations." Subsurface soil conditions should also be evaluated along the proposed levee alignment as part of the preliminary design to evaluate the potential for under-seepage, which can destabilize the levee foundation or result in salinity intrusion into the freshwater forested wetland area.

The cost estimate includes an optional levee design that would accommodate relocation of the Lanphere and HBNWR Dune Unit access road onto the setback levee, to allow for restoration of transitional habitat between the forested wetland and upland dune forest along the existing road alignment. The road-on-levee option would increase the top width of the levee to 24 feet. If the road-on-levee option is adopted, the proposed levee alignment should be revaluated for potential impacts on existing forested wetland habitat.

Freshwater drainage ditch. A new freshwater drainage ditch would be excavated behind the new setback levee, to collect surface runoff and groundwater seepage from the dunes and forested wetland area. The ditch would extend approximately 2,300 feet in length, with a top width of 9 feet and a depth of 3 feet below existing grade.

Freshwater drainage culverts. Two new drainage culverts with flap gates would be installed through the setback levee, to convey surface runoff and groundwater seepage from the dunes and forested wetland area into the restored tidal wetland.

Fill existing drainage ditches. The existing network of drainage ditches would be filled to the adjacent ground elevation, to encourage development of a natural tidal channel network. Existing ditches are approximately 3 to 4 feet deep, with a typical top width of 15 feet.

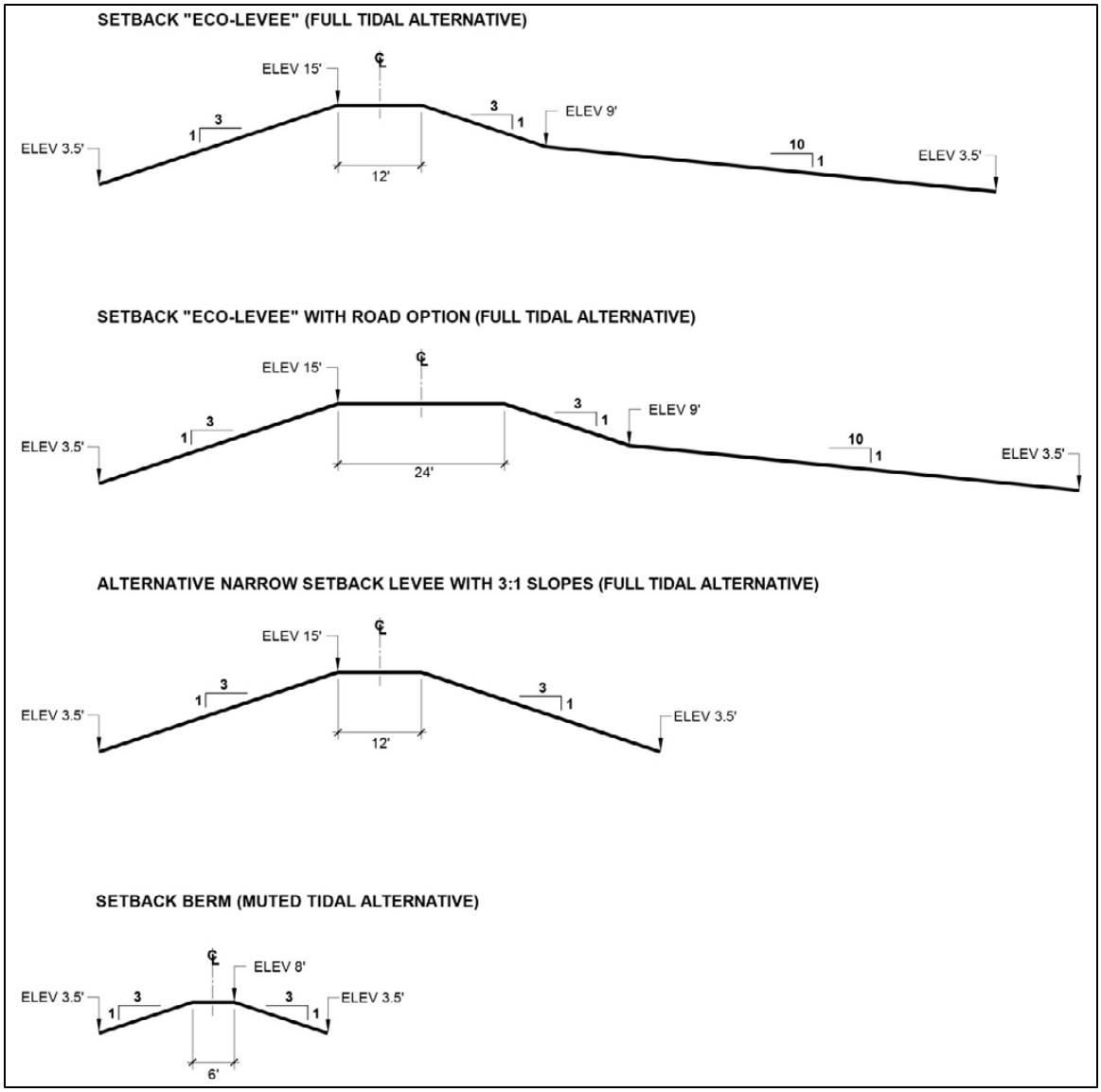


Figure 4-3. Conceptual Levee and Berm Cross Sections

Fill placement. The conceptual restoration plan includes placement of approximately 20,000 cubic yards of fill, to raise site elevations to an appropriate elevation for salt marsh vegetation colonization (see Section 4.1.3). This quantity of fill would raise approximately 20 percent of the restoration area that falls within the elevation range of 2 to 4 feet NAVD88 to an elevation of 5 feet NAVD88. This quantity of fill (sufficient to bring approximately 5 acres of the site to an elevation for early salt marsh vegetation establishment) corresponds to the “low fill” option discussed in the Site Evolution (Attachment E). If desired and feasible, more of the site could be filled to 5 feet NAVD88 or higher, to establish a greater initial acreage of salt marsh; optional costs for additional fill importation are provided in Chapter 5.

Preserve and restore forested wetland and coniferous dune habitat. Native habitats behind (to the west of) the constructed setback levee would also be preserved and restored under this alternative (Figure 4-1). Approximately 10 acres of high quality forested wetland and freshwater marsh habitat would be preserved and managed to remove noxious invasive species, while an additional 5 acres of forested wetland would be planted adjacent to existing forested wetland, in that are currently upland pasture or agricultural wetlands. Upland pasture areas may require some minor grading to wetland elevations prior to planting.

Additionally, the approximately 1 acre relic dune situated west of the setback levee would be restored as an upland buffer from nonnative annual grassland to coniferous dune forest (beach pine forest vegetation alliance).

4.1.3. Basis of Design

4.1.3.1. TIDAL CHANNEL PLANFORM

The conceptual restoration plan includes excavation of the levee breach, pilot channel, and interior starter channels to convey tidal waters between MRS and the restored site. The channel planform dictates the order, length, and number of channels in a wetland. AECOM used the Design Guidelines for Tidal Channels in Coastal Wetlands (Philip Williams and Associates (PWA) and Faber 1995) and the MRS reference site to guide the channel planform design at the project site. The PWA report studied several coastal wetlands throughout California and identified key characteristics of each wetland, including drainage density, channel bifurcation, channel distribution, channel order, and channel length. PWA developed design guidelines for channel planforms from analysis of the channel planform parameters. The guidelines provide specifications for drainage density, channel bifurcation ratio, and channel order distribution. To provide a local reference point to the PWA guidelines, the planform of the MRS reference site was delineated and the characteristics of this wetland (e.g., the drainage density and channel order distribution) were identified and compared against the PWA guidelines. The reference site values fell within the range of those provided in the PWA report, confirming the applicability of the design guidelines for restoration planning efforts in MRS.

Table 4-1 shows the anticipated channel order, distribution, channel length, and number of channels at the Lanphere parcel under the full tidal restoration alternative. The 30-acre restoration area would support a 5th order tidal channel network, based on the design guidelines criteria and comparison with the reference site. The reference site includes a 9-

Table 4-1. Channel Planform Characteristics for Project Site—Full Tidal Alternative

Channel Order	Distribution	Total Channel Length (feet)	Number of Channels	Average Channel Length (feet)
1	43%	10,950	150	70
2	26%	6,550	43	150
3	17%	4,310	12	360
4	12%	2,940	4	740
5	2%	520	1	520

Note:
1st through 3rd order channels are not proposed for construction at the Lanphere parcel. Based on past tidal wetland restoration experience, these lower order channels would develop naturally.
Source: AECOM 2015

acre tidal marsh and supports a 4th order system. The channel planform characteristics were developed assuming a drainage density of 0.02 feet/square feet and a bifurcation ratio of 3.5 to estimate the number of channels in each order and total channel length in the wetland.

TIDAL CHANNEL DIMENSIONS

Tidal channels were sized using hydraulic geometry relationships developed for San Francisco Bay (Williams et al. 2002). Hydraulic geometry provides a method to calculate anticipated channel dimensions as a function of tidal prism[3] and/or marsh drainage area. NH&E (2009) compared San Francisco Bay and MRS hydraulic geometry relationships and found good agreement, despite differences in tidal characteristics. NH&E recommended the use of the Williams et al. (2002) equations for design of tidal channels in MRS with contributing marsh areas greater than 5 acres.

AECOM estimated short-term and long-term channel dimensions using the hydraulic geometry relationships. Short-term dimensions are larger than long-term dimensions because restored sites typically are subsided and require larger channels to convey the initially larger tidal prism. Channel dimensions decrease over time, as estuarine sedimentation builds up site elevations and the tidal prism decreases. Estimated short-term and long-term channel dimensions are shown in Table 4-2.

[3] Tidal prism refers to the volume of tidal water exchanged between the restored site and MRS from high tide (MHHW) to low tide (MLLW). The tidal prism of the restored site can be approximated as the storage volume between MHHW and the existing ground elevation within the restored area.

Table 4-2. Short-Term and Long-Term Channel Dimensions at Restored Lanphere Parcel—Full Tidal Alternative

	Short-Term Dimensions				Long-Term Dimensions			
Channel	XSA (square feet)	Depth (feet MHHW)	Width (feet)	Invert (feet NAVD88)	XSA (square feet)	Depth (feet MHHW)	Width (feet)	Invert (feet NAVD88)
Breach/ Pilot Channel	711	10.6	118	-3.6	168	7.1	42	-0.1
5th Order	711	10.6	118	-3.6	168	7.1	42	-0.1
4th Order	315	8.5	66	-1.4	65	5.5	22	1.6
3rd Order	140	6.8	37	0.3	25	4.2	11	2.8

Note: 1st through 3rd order channels are not proposed for construction at the Lanphere parcel. Based on past tidal wetland restoration experience, these lower order channels would develop naturally.
Source: AECOM 2015

Table 4-3 shows the proposed constructed channel dimensions for the levee breach, pilot channel, and interior starter channels. The proposed channel dimensions are slightly larger than the long-term equilibrium dimensions but smaller than the short-term dimensions. The conceptual design proposes to excavate the 5th and 4th-order tidal channels only and allow the lower order smaller channels to develop naturally over time.

Table 4-3. Proposed Constructed Channel Dimensions—Full Tidal Alternative

Channel	Adjacent Existing Grade (feet NAVD88)	Depth below Existing Grade (feet)	Top Width at Existing Grade (feet)	Bottom Width (feet)	Invert (feet NAVD88)
Breach	7.0	8.0	54	6	-1.0
Pilot Channel	2.0	3.0	24	6	-1.0
5th Order	3.0	4.0	30	6	-1.0
4th Order	3.0	2.0	18	6	1.0
3rd Order	3.0	Not proposed for construction			

Note:
1st through 3rd order channels are not proposed for construction at the Lanphere parcel. Based on past tidal wetland restoration experience, these lower order channels would develop naturally.
Source: AECOM 2015

VEGETATION ESTABLISHMENT

Natural sedimentation gradually would raise site elevations to a level where salt marsh vegetation could become established. Understanding the lower elevation limit at which vegetation will establish is a key consideration in the restoration design and projected site evolution. AECOM reviewed available sources of vegetation survey data within Humboldt Bay to estimate the anticipated lower and upper boundaries of vegetated salt

marsh and mean equilibrium marsh plain elevation (Attachment E). The following findings were developed, based on review of the data:

- The lower limit of salt marsh vegetation is expected to fall within the range of 4.6 to 5.6 feet NAVD88 (approximately 5.0 +/- 0.5 feet NAVD88) at the project site.
- The upper limit of salt marsh vegetation is expected to fall within the range of 7.3 to 9.3 feet NAVD88 (approximately from MHHW to MHHW + 2 feet) at the project site. The upper limit of salt marsh vegetation is influenced by factors other than the limit of high tides alone; freshwater input is another key factor.
- The average elevation of vegetated marsh plain is expected to fall within the range of 5.9 to 7.0 feet NAVD88 at the project site.
- Based on the information presented above, AECOM estimated the habitat zone boundaries at the restored site for the full tidal restoration alternative. The estimate elevation ranges for the habitat zones within the restored site are shown in Table 4-4.

The salt marsh vegetation is expected to naturally recruit quickly within appropriate elevations at the project site (described above), after the MRS levee is breached, to establish appropriate hydrology and connectivity with adjacent tidal ecosystems. Without additional sediment deposition expected to occur over time, initially approximately 5 acres of the central portion of the site would support salt marsh vegetation with the above proposed fill quantities, plus approximately 3.5 additional acres on the lower slope of the setback ecolevee. Pickleweed in particular is a very fast colonizing species of the full range of salt marsh elevations and is dominant in nearby MRS salt marshes. It may be desirable to accelerate the process of vegetation development by also planting source “islands” of salt marsh vegetation, consisting of plugs or sod of salt marsh plant species (including pickleweed, saltgrass, and marsh jaumea) to facilitate early vegetation colonization and reduce area for invasion by *Spartina*. Planting in dense islands (as opposed to dispersed plantings) can promote positive interactions between plants in high stress environments, and has been shown to increase plant growth and survival in salt marsh restoration (Silliman et al. 2015). Additional appropriate native species can be planted at appropriate locations within the site to add to species diversity over time. Regardless of planting approach, *Spartina* would need to be controlled during the vegetation establishment period, as discussed in Section 4.1.5, under “Invasive Species Control.”

Table 4-4. Estimated Elevation Ranges for Habitat Zones within Restored Site – Full Tidal Alternative

Habitat Zone	Predicted Lower Boundary (feet NAVD88)	Predicted Upper Boundary (feet NAVD88)	Notes
Subtidal open water	-	-1.15 ft.	Subtidal open water at all elevations below MLLW
Mudflat	-1.15	5.0 +/- 0.5	Mudflat occurs above MLLW up to lower boundary of vegetated salt marsh
Salt marsh	5.0 +/- 0.5	9.0 +/- 0.5	Salt marsh boundaries based on examination of available data (Attachment E); mean marsh plain elevation expected to equilibrate around 6.6 feet NAVD88
Upland transition	9.0 +/- 0.5 ft.	-	Project design incorporates a protective levee around forested wetland on west side with freshwater drainage culverts; therefore, highest salt marsh would occur on levee transitional slope and sufficient freshwater influence would not be likely to affect the upper boundary of salt marsh vegetation or create a brackish marsh fringe except in localized areas.

Note:
Estimated elevation ranges reported for full tidal restoration alternative at the project site. Elevations reported relative to the NAVD88 datum can be converted to MLLW by adding 1.15 feet (see Attachment C).
Source: AECOM 2015

The lower portion of the waterside slope of the setback levee would be colonized with salt marsh vegetation, while the landside slope and upper portion of the waterside slope would be seeded with native grasses.

Behind the setback levee, expansion of forested wetland would follow methods described in Section 4.3.3 “Basis of Design” for the freshwater non-tidal alternative. Forested wetland restoration would involve minor grading in upland areas to be planted with forested wetland habitats, invasive plant control, and seeding and planting of native species. The relic dune would also be planted with appropriate native species to establish an upland dune forest.

4.1.4. Projected Site Evolution

AECOM performed a site evolution assessment in support of the conceptual restoration design for the full tidal alternative. Low-lying restored wetlands evolve through natural sedimentation in which suspended sediment is carried into the site during the flood tide and deposits on the bed during slack water. Accumulation of organic material from marsh plants also contributes to raise site elevations after vegetation establishes. Many factors would affect the long-term evolution of the restored site, including initial site elevation, suspended sediment availability, circulation and tidal dynamics, vegetation establishment,

and rate of relative sea level rise. These site evolution considerations are discussed in more detail in Attachment E. In general terms, site evolution towards equilibrium marsh conditions would be more rapid with higher initial site elevations, higher ambient suspended sediment concentrations, full tidal exchange, limited wind wave action, rapid vegetation establishment, and low rates of relative sea level rise. Restoration designs that meet these conditions, to the maximum extent possible, will have greater likelihood of achieving project goals and objectives.

AECOM performed sedimentation modeling and habitat projections as part of the site evolution assessment (see Attachment E). The site evolution assessment evaluated a range of initial elevations, two sea level rise scenarios (i.e., mid-range and high-range), and three fill options (i.e., none, low, and high fill[4]). The findings of the site evolution assessment are summarized as follows:

- Existing site elevations are approximately 1 to 3 feet below the elevation at which salt marsh vegetation will establish. Relying on natural sedimentation alone (no fill) to raise site elevations could delay establishment of vegetated marsh until 15 to 30 years after restoration, or longer, depending on MRS sediment supply.
- Placement of fill to raise site elevations to the vegetation colonization level (approximately 5.0 feet NAVD88) would expedite establishment of some vegetated marsh within the site (within 0 to 5 years).
- Future rates of sea level rise may exceed the natural ability of existing and restored marshes within MRS to maintain their elevation relative to increasing tide levels.

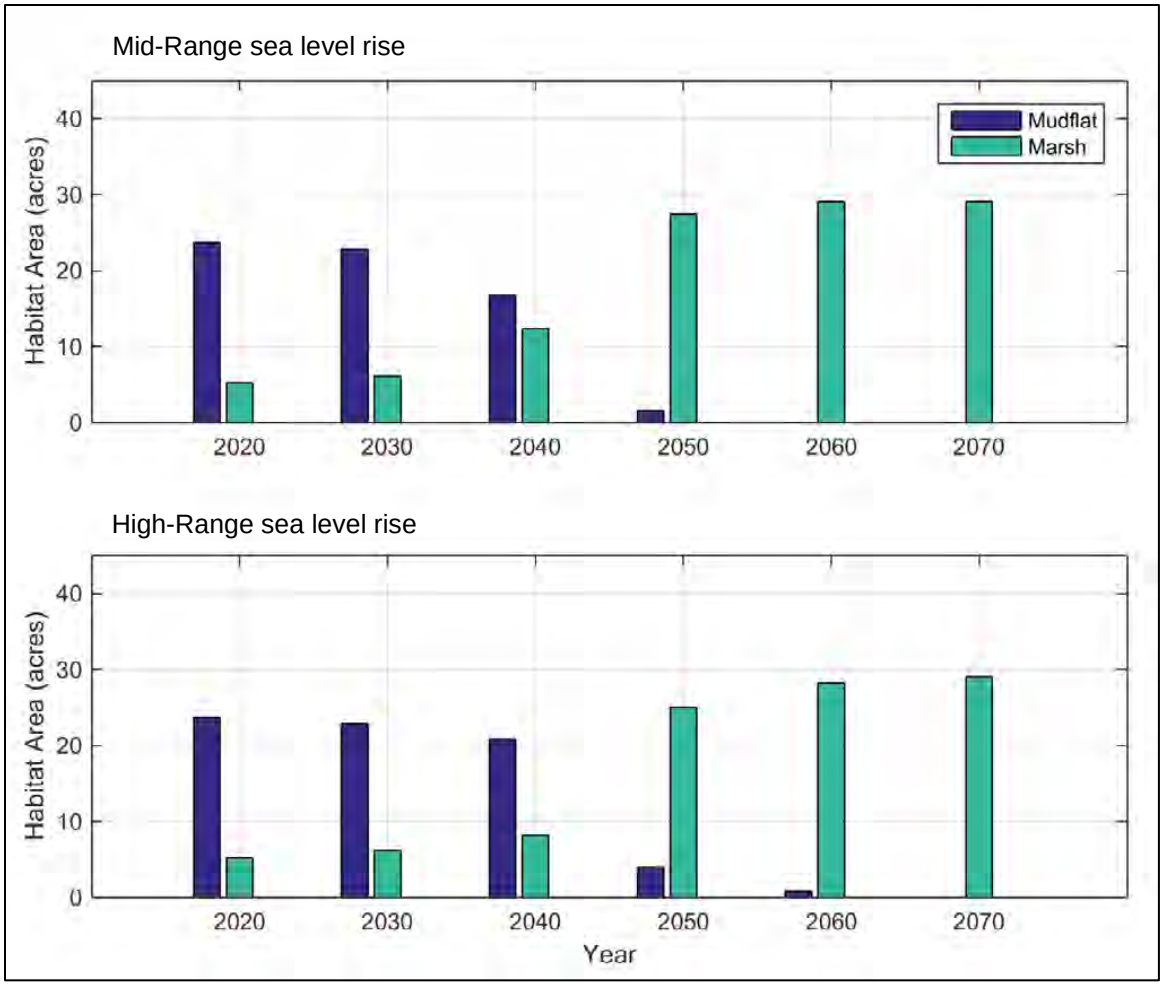
The habitat projections for the low fill option are shown in Figure 4-4 and Table 4-5.

4.1.5. Design Considerations

4.1.5.1. Sources of Fill

The conceptual restoration design proposes placement of approximately 20,000 cubic yards of fill over an area of approximately 5 acres, to raise site elevations to a suitable level for vegetation establishment. In addition, a substantial quantity of fill (approximately 67,000 cubic yards) would be required for construction of the setback levee. Identifying a nearby source of suitable fill material is a key design constraint for this project.

[4] The high fill option is not discussed in detail in the Conceptual Design Report because it was deemed too costly; however, site evolution results for the high fill option (filling 80 percent of the restoration area that falls within the elevation range of 2 to 4 feet NAVD88 to an elevation of 5 feet NAVD88) are presented in Attachment E. Additional costs to implement the high fill option, which would import an additional 50,000 cubic yards of fill material to the site, are presented in Chapter 5.



Notes: 2020 construction year assumed for site evolution assessment.
Acreage of salt marsh and mudflat presented for 2020 and 2030 does not include the approximate 2.5 acres that would be expected to develop on the lower slope of the setback "eco-levee" because site evolution modeling was done using the existing topography base layer. Source: AECOM 2015

Figure 4-4. Habitat Projections for Full Tidal Restoration Alternative with Low Fill Option

A recently completed feasibility study of beneficial reuse of dredged material (SHN et al. 2015) identified the use of dredged material as an opportunity to increase surface elevations of diked tidelands, to facilitate tidal marsh restoration activities. Attachment A presents a discussion of Humboldt Bay sediment management activities, including potential sources and receiver sites for fill material.

AECOM identified the following projects as potential sediment sources for tidal wetland restoration activities within Humboldt Bay: Woodley Island and Eureka Marina dredging, HBHRCD's dewatering site at Samoa, Port of Humboldt Bay navigation channel

Table 4-5. Habitat Projections for Mid-Range and High-Range Sea Level Rise Scenarios – Full Tidal Alternative

Fill Option	Habitat Type*	Habitat Area Projections (acres)					
		Year 0 (Post-Construction)	Year 10	Year 20	Year 30	Year 40	Year 50
Mid-Range Sea Level Rise Scenario (19 inches by 2070)							
No fill	Mudflat Salt Marsh	28 1	28 1	20 9	2 27	0 29	0 29
Low fill	Mudflat Salt Marsh	24 5	23 6	17 12	2 27	0 29	0 29
High fill	Mudflat Salt Marsh	10 19	9 20	7 22	2 27	0 29	0 29
High-Range Sea Level Rise Scenario (33 inches by 2070)							
No fill	Mudflat Salt Marsh	28 1	28 1	25 4	4 25	1 28	0 29
Low fill	Mudflat Salt Marsh	24 5	23 6	21 8	4 25	1 28	0 29
High fill	Mudflat Salt Marsh	10 19	9 20	8 21	4 25	1 28	0 29

Notes:
Low (high) fill options refer to raising approximately 20 percent (80 percent) of the restoration area that falls within the elevation range of 2 to 4 feet NAVD88 up to an elevation of 5 feet NAVD88.
A 2020 construction date has been assumed for simplicity.
*Acreage of salt marsh and mudflat presented for 2020 and 2030 does not include the approximate 2.5 acres of salt marsh vegetation that would be expected to develop on the lower slope of the setback "ecolevee" because site evolution modeling was done using the existing topography base layer.
Source: AECOM 2015

dredging, Salt River Ecosystem Restoration Project, Bear River Band of the Rohnerville Rancheria construction project, Martin Slough Restoration Project, Jacoby Creek Off-Channel Habitat Restoration Project, and other small dredging projects such as the fisherman's channel at King Salmon.

AECOM identified the following projects as potential receiver sites for beneficial reuse of sediment within Humboldt Bay: White Slough restoration project, Hookton Slough restoration project, Salmon Creek Unit restoration project, and City of Arcata Living Shorelines Project.

Based on discussions with HBHRCD and State Coastal Conservancy staff (Wagschal and Gerwein, pers. comm., May 2015), numerous potential sources of sediment exist but also a relatively high demand for sediment exists at multiple restoration sites. No formal process exists for matching source and receiver sites on a regional level, although USFWS, the California Coastal Conservancy, the HBHRCD, and the North Coast Regional Water Quality Control Board are the primary coordinating agencies. Also, any sediment identified as a potential source of fill for the project site would need to be tested

for contaminants and compatibility with restoration goals and objectives, as well as would need to be feasible from a construction, cost, and permitting perspective.

A detailed feasibility analysis of potential sources of fill material for the Lanphere project was not conducted as part of the conceptual design; however, the following potential issues with fill import were identified:

- Load capacity of Lanphere Slough bridge – The bridge is maintained by Humboldt County. The National Bridge (Federal Highway Administration 2014) Inventory reports that the bridge meets the HS 20 + Mod design standard with an inventory load rating of 36 tons[5]. The bridge could therefore support a standard dump truck carrying approximately 15 to 20 cy of dry material (assuming a dump truck weight of 15 tons and unit weight of fill of 1.0-1.5 tons/cy).

- Lanphere site access – The Lanphere project site is located approximately 3 miles from HWY 101 and is accessed from Janes Road, Upper Bay Road, and Lanphere Road. The logistics of transporting many truckloads of required fill material to the site should be evaluated further. Portions of Upper Bay Road and Lanphere Road lack sufficient width for two-way traffic and may require active traffic control.

- Feasibility of beneficial reuse of dredged material – The HBHRCD is currently planning a pilot study to pump approximately 4,000 cy of dredged material approximately 2.5 miles from King Salmon to the White Slough restoration site. AECOM staff discussed the feasibility of pumping dredged material to the Lanphere site with HBHRCD and State Coastal Conservancy staff (Wagschal and Gerwein, pers. comm., December 2015) and identified several potential logistical issues:

  - The USACE dredging vessels that normally operate within Humboldt Bay are hopper dredges that do not have direct pumpout capability and typically dispose dredged material at an open ocean disposal site.

  - The Lanphere site is relatively far from Humboldt Bay dredging activities and the HBHRCD does not currently own enough booster pumps and pipeline to pump dredged material to the project site. It is possible that material from the Samoa dewatering site (at the intersection of New Navy Base Road and SR 255) could be slurried and pumped to the Lanphere site, a distance of approximately 5.5 miles, if additional equipment were obtained.

[5] The inventory load rating is the repetitive load level than can be used on the bridge for an indefinite period of time.

- Any source material pumped to the Lanphere parcel would be subject to relatively strict testing requirements by the Regional Water Quality Control Board. Sediment currently stored at the Samoa dewatering site has not yet been tested for compatibility with potential receiver sites.

Excavation of the tidal channel network would provide some fill for use on-site, as reflected in the quantities and cost estimates (Chapter 5), but not a substantial portion of the fill that would be required to build the setback levee or raise site elevations. The existing MRS levee is not anticipated to provide a substantial fill source because of the amount of debris likely contained within the levee.

The proposed conceptual restoration plan conservatively assumes that fill material for the new setback levee would be imported from off-site. The levee should be constructed of a low permeability material to prevent uncontrolled through-seepage, internal erosion, and piping[6]. The composition of fill material used to raise site elevations is less critical than for the levee fill. Salt marsh vegetation species have a broad range of suitable soil types and the success of vegetation colonization is mostly dependent on the initial site elevations and sedimentation rate. Another aspect to consider is soil fertility – organic content, soil salinity, and nutrient levels can affect the success of vegetation establishment. Finer soils such as clays and silts may support greater vegetation establishment success due to a presence of higher organic matter (Haltiner et al. 1997). It is anticipated that natural estuarine sedimentation within the restored site would provide a layer of suitable soil for vegetation establishment, regardless of the characteristics of the underlying fill material.

EXISTING LEVEE

The conceptual restoration design proposes a partial lowering of the existing levee to an elevation of 7.0 feet NAVD88 (approximately MHHW) along a 100-foot segment on either side of the levee breach, to create vegetated salt marsh habitat and improve hydrologic connectivity with MRS during high tides. The levee could be lowered along its entire 1,900-foot length, which would produce approximately 6,000 cubic yards of material and 1.5 acres of salt marsh habitat; however, greater benefit would be gained by leaving the existing levee in place.

[6] The clay content of the fill material should be adequate to override the more erosive properties of the silt and sand fraction. The clay fill material should have low to non-expansive properties and low to moderate plasticity to increase workability, achieve better strength and stability, and prevent dessication cracking. A sandy to silty clay with fines content of at least 30 percent with a plasticity index less than 30 percent would generally satisfy the levee design objectives.

This recommendation is based on the following findings and observations:

- The levee is constructed of a cohesive clay material, which could provide suitable material for on-site placement; however, decomposing lumber, glass, metal fragments, car parts, and other debris were observed at waterside erosion sites within the original levee fill. The levee also is heavily vegetated and may require substantial removal of native vegetation before placement within the restoration site. This likely would decrease the volume of suitable fill material available for on-site disposal.

- The existing levee is vegetated with a moderate diversity of native species and provides topographic and habitat diversity that likely is beneficial to wildlife. The levee would provide upland refugia immediately adjacent to the restored wetland and, from an ecological standpoint, the wetland/upland margin provides high functions and values.

- The levee would provide sheltering of the restored site and would reduce wind wave action over the exposed mudflats. This would promote sedimentation within the site and would accelerate site evolution.

- The levee would gradually erode naturally over time and would become incorporated into the surrounding landscape, if left intact.

INVASIVE SPECIES CONTROL

Regardless of whether the high fill or low fill options are implemented, substantial potential exists for invasion by *Spartina*. This species is most likely to colonize areas between 5.3 and 6.2 feet NAVD88 at this site (Eicher 1987; Pickart 2001), but has the potential to establish from 5.0 to 9.3 feet NAVD88. Because *Spartina* is highly competitive, maintenance and control of the species would be required until native vegetation establishment is widespread throughout the marsh. Marshes in Humboldt Bay that tend to be least invaded by *Spartina* typically are correlated with higher elevations, less reduced soils (more oxygenated), and abundant shallow drainage channels (Falenski 2007). Design elements of this alternative that could discourage *Spartina* invasion are the excavation of shallow drainages to convey freshwater, which would transport oxygenated waters through the marsh from the forested wetlands to MRS, placement of fill, and planting to accelerate establishment of native salt marsh vegetation. Maximizing fill placement and the density and extent of the shallow drainage channels would discourage *Spartina* establishment. An invasive species management plan, including regular monitoring and removal of *Spartina*, should be developed and implemented for at least 4 years or until native species establishment is densely widespread.

Numerous mechanical and chemical control methods could be used in combination for *Spartina* control. Mechanical control treatments tend to be preferred and more effective. These would include mowing, grinding, tilling, excavation, disking, crushing, flaming, covering, and flooding (CCC 2012, 2013). Pickart (2012) documented that treatment with a subsurface "grind technique" effectively controlled mature plants if implemented for 1 to 2 years. Initial treatment applied a tri-blade brush cutter directly on the shallow rhizomes, while follow-up treatments involved grinding re-sprouts at approximately 6-month intervals. After the first "grinding" treatment, a dense emergence of *Spartina* seedlings (mean 240/square meters) was observed, and the seedlings were flamed or removed with brush cutters, which was followed by much lower subsequent emergence. A "deep" grind (4 to 6-inch depth) has been shown to minimize a flush of seedling emergence that may appear after the first year, and to eliminate much of the seed bank (Pickart 2012). Currently, USFWS is using a 2 to 4-inch "shallow grind" approach in this region, to minimize non-target impacts while still achieving good *Spartina* control.

For more information on *Spartina* control and eradication, the Humboldt Bay Regional *Spartina* Eradication Plan (CCC 2012) and USFWS *Spartina* Eradication Project (USFWS 2011) details and summarizes methods; and the Final Programmatic Environmental Impact Report for the Humboldt Bay Regional *Spartina* Eradication Plan assessed impacts associated with various control methods (CCC 2013).

The full tidal alternative also would include enhancement and expansion of the freshwater forested wetland. Approximately 10 acres of existing forested wetland and freshwater marsh would be preserved and would benefit from invasive species eradication efforts. Some invasive species that may be expected to establish, or that already have established, within the area include Himalayan blackberry, reed canarygrass, French broom, English ivy (*Hedera helix*), fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), and perennial pepperweed (*Lepidium latifolium*). Himalayan blackberry is present in patches in the drier wetland and forested wetland areas. USFWS has noted an increase in reed canarygrass in the existing freshwater marsh portion of the site. French broom occurs in some of the forested wetland locations in the general area, and some scattered individuals were observed on the existing levee slope. English ivy has become problematic in some of the dune forests and forested wetlands in the general area. In addition, many of the nonnative perennial grasses that currently dominate the meadow are competitive and somewhat difficult to eradicate; these include common velvetgrass, tall fescue, meadow foxtail, Kentucky bluegrass, and canary grass (*Phalaris aquatica*).

Project phasing and design would be timed in a manner to allow control of invasive species before installing plants. After restoration is completed, regular monitoring for these species and others that have the potential to establish should be conducted, and an invasive species management plan should be implemented for at least 4 years or until native species establishment is densely widespread, to ensure success of the restoration effort. The plan should include a comprehensive list of which species currently are present on-site, their on-site distribution, and which species have the potential to invade the site.

For more information on invasive species present on the project site or in similar habitat types, UFWS and CDFW have prepared a comprehensive list of Vascular Plants of Humboldt Bay's Dunes and Wetlands, which is available at www.fws.gov/refuge/humboldt_bay (USFWS and CDFW 2014).

OPPORTUNITIES FOR ESTABLISHMENT OF EELGRASS

Pacific Watershed Associates (PWA) evaluated opportunities for establishment of eelgrass (*Zostera marina*) within the restored Lanphere parcel under the full tidal alternative (Pacific Watershed Associates 2015):

> *PWA believes there is a strong potential for incorporating an eelgrass component into the full tidal restoration alternative at the Lanphere parcel. Establishment of eelgrass would represent a relatively small portion of the overall project but would likely meet Caltrans' mitigation needs associated with the Humboldt Bay Bridge Project. Incorporating an eelgrass component into the Lanphere restoration project would likely be the most cost-effective way of achieving the required mitigation.*
>
> *Narrow, channel fringing eelgrass beds occur along MRS immediately adjacent to the project site, which strongly suggests that eelgrass habitat could be created within the restored area. PWA estimates that eelgrass may establish within an elevation range of -4 to 0 ft NAVD88 within the lower portion of tidal channels and/or intertidal mudflats within the project site. Conducting a field investigation to establish the preferred depth range and channel side slope for eelgrass in the vicinity of the project area would allow for refinement of this estimate.*

The conceptual restoration plan for the full tidal alternative includes excavation of a breach and main channel that would extend to a depth of -1.0 feet NAVD88, which falls within PWA's estimated range for eelgrass establishment. AECOM estimates that a 200-

foot-long segment of the main channel immediately landward of the levee breach would support a channel invert near this elevation. Off-channel subtidal areas could be excavated within the site to create additional habitat suitable for eelgrass establishment; however, excavated off-channel areas may be subject to poor circulation and drainage, water quality issues, and fish stranding. These areas also would be likely to experience rapid sedimentation, which may limit sediment delivery to other parts of the site and delay evolution to vegetated marsh plain. Further field investigations would be required to establish the optimal channel design depths and morphological configurations to support eelgrass within the restored site.

4.1.6. Ecological Functions and Values

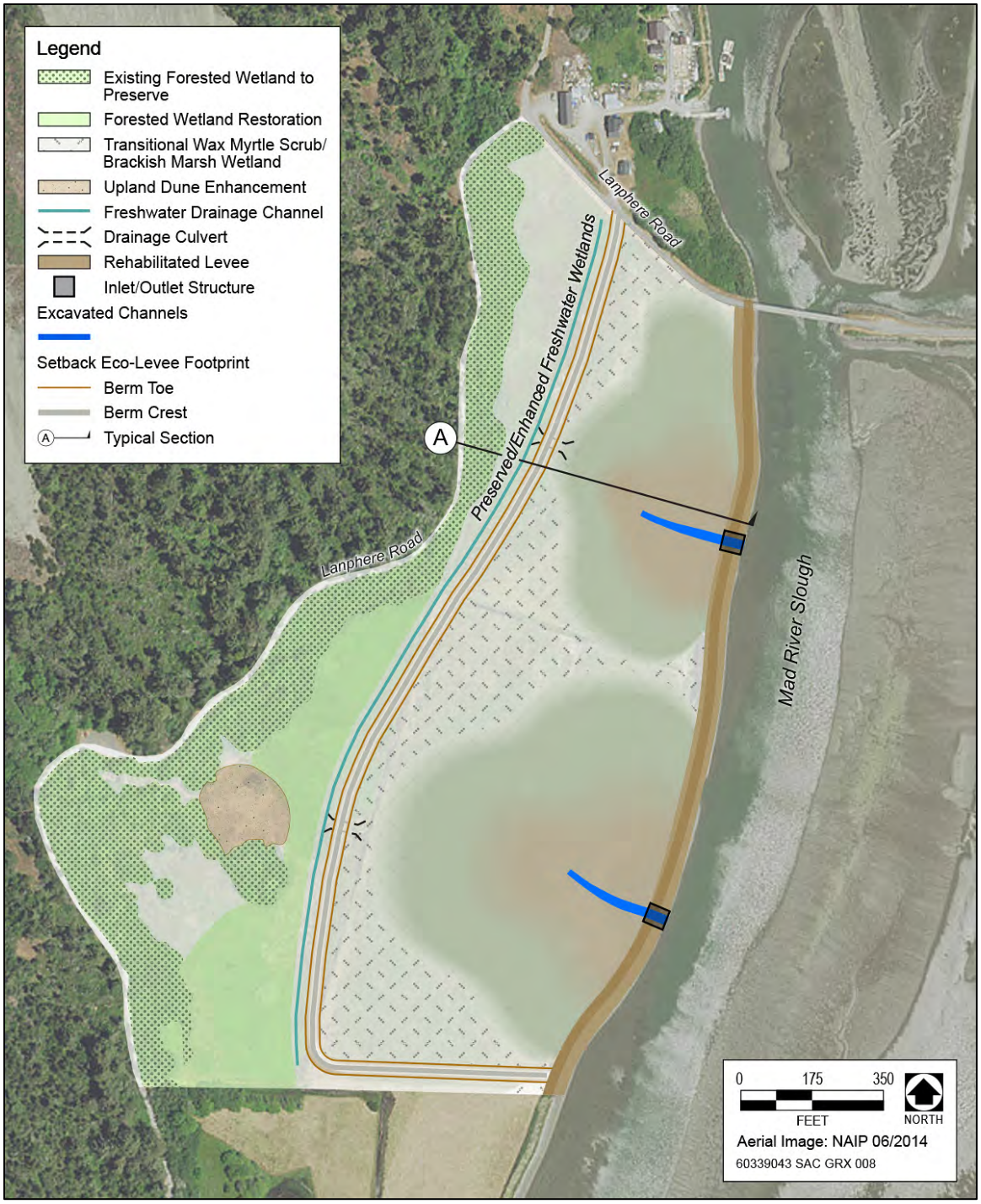
The Lanphere project site and surrounding areas historically were tidal marsh and mudflat habitats. Both habitat types provide various ecological functions, have potential to buffer levels of sea level rise, and reduce flooding potential in adjacent areas. Vegetated tidal marshes tend to provide habitat for small invertebrates, mammals, refugia for fish, nursery habitat for fish, and tend to be a food source for shorebirds. The excavated channels near the mudflats also provide an opportunity for incorporating eelgrass, which provides high habitat value for fish and invertebrate species. The mudflats also provide high quality habitat for invertebrates, zooplankton, and algae; and provide vast areas of habitat for larger, subsurface dwelling mollusks and annelids, which are an essential source of food for a variety of shorebirds.

Mudflats provide the largest potential to buffer increases in sea level because as sediment accretes, vegetated tidal and subtidal habitats form. Some fill would be placed to raise a portion of the site to an elevation where salt marsh vegetation would establish in the short term, but over time natural sedimentation would raise site elevations and mudflat habitat would naturally convert to vegetated marsh. Restoring the project site to habitats that historically were present would be the most sustainable option, would provide the greatest ecological function and value, and would improve habitat continuity within the MRS area. Natural biogeochemical processes and continuity with MRS habitats would be restored, leading to less maintenance of the restored self-sustaining tidal areas in the long term.

4.2. Muted Tidal Alternative

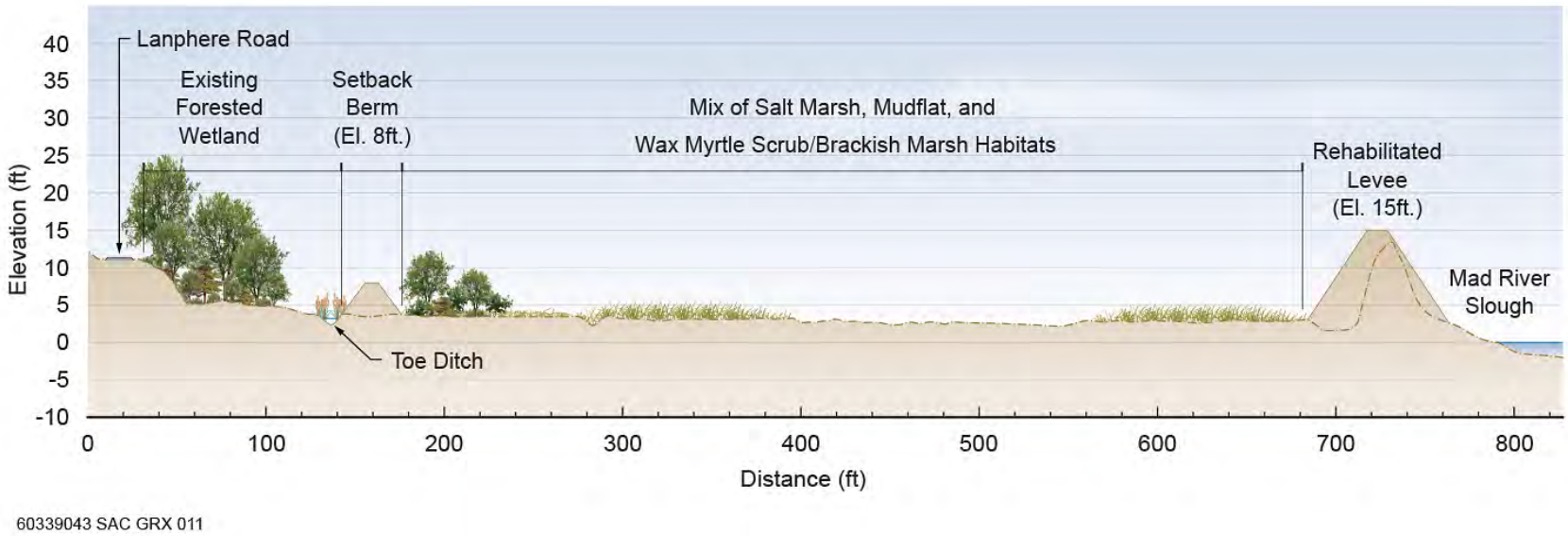
4.2.1. Conceptual Restoration Plan

The conceptual restoration plan for the muted tidal alternative is shown in Figures 4-5 and 4-6. The conceptual restoration plan includes rehabilitating the existing levee, installing an intake/outlet hydraulic structure, constructing a setback berm along the



Source: AECOM 2015

Figure 4-5. Conceptual Restoration Plan Layout –Muted Tidal Alternative



Source: AECOM 2015

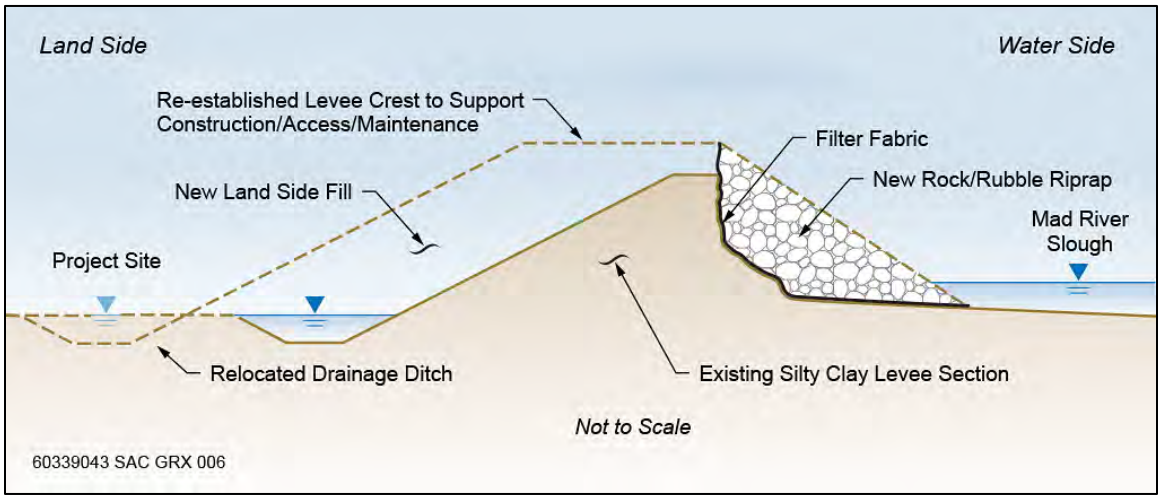
Figure 4-6. Conceptual Restoration Plan Cross Section – Muted Tidal Alternative

southern and western boundaries of the restored site, installing a drainage system (i.e., drainage ditch and culverts) to connect the forested wetland to the tidal wetland, filling the existing drainage ditch network, and excavating a starter channel within the restored site.

4.2.2. Restoration Design Elements

The restoration design elements for the muted tidal alternative are described next.

Rehabilitate existing levee. The existing 2,000-foot levee would be rehabilitated to provide flood protection to the Lanphere parcel from MRS. The levee rehabilitation would include placing rock riprap along the eroded slough side of the levee and new land side fill to increase the crest width, height, and stability of the existing levee (Figure 4-7).



Source: AECOM 2015

Figure 4-7. Conceptual Mad River Slough Levee Rehabilitation

Install intake/outlet hydraulic structures. Two intake/outlet water control structures would be installed in the rehabilitated levee to create a muted tidal environment within the restored site. The proposed water control structures would consist of one 4-foot-diameter, two-way culvert at 2 feet NAVD88 invert elevation and one 4-foot-diameter drainage only culvert at 0 feet NAVD88 invert elevation, to create an acceptable inundation regime within the site. Further discussion with resource agencies would be needed to determine how water structures should be designed to minimize impacts on fish and to determine whether the project site would provide beneficial fish habitat under a muted tidal regime (because the water control structures would not allow fish egress at high tide). Hydraulic modeling conducted as part of the conceptual design indicated that

operation of the intake culverts at a capacity comparable to a 1-foot-diameter pipe would provide adequate hydraulic conveyance to achieve appropriate inundation characteristics within the site. A 4-foot-diameter culvert is proposed to provide increased flexibility in future operations of the muted tidal hydraulics.

Setback berm. A new 2,800-foot setback berm would be constructed along the southern and western boundary of the restoration area, to provide flood protection to the adjacent Ralph parcel, forested wetland, and Lanphere Road. The berm would be constructed to an elevation of 8 feet NAVD88, with a top width of 6 feet (Figure 4-3). The berm height relative to existing grade would be approximately 4 feet. The proposed crest elevation would provide 2 feet of freeboard above the anticipated maximum water level within the site under the muted tidal hydrology and would accommodate 19 inches of sea level rise over the 50-year planning horizon, approximately to 2070.

Starter channels. Two 200-foot-long starter channels would be excavated from the intake/outlet structures into the restored site, at an invert elevation of -1.0 feet NAVD88. The channel bottom would be approximately 3 feet below the adjacent grade, with a bottom width of 6 feet and top width of 24 feet. An interior tidal channel network would not be excavated within the restored site as part of the muted tidal alternative.

Existing drainage ditches. The existing network of drainage ditches would be filled to the adjacent ground elevation, to encourage development of a natural tidal channel network. Existing ditches are approximately 3 to 4 feet deep, with a typical top width of 15 feet.

Site grading. The existing site topography is relatively flat and likely would require re-contouring to facilitate efficient drainage and full hydraulic connectivity throughout the site. A detailed grading plan was not developed for the conceptual design; however, a 5,000-cubic yard allowance for on-site earthwork is included in the cost estimate.

Freshwater drainage ditch. A new freshwater drainage ditch would be excavated behind the new setback berm, to collect surface runoff and groundwater from the dunes and forested wetland area. The ditch would extent approximately 2,300 feet in length, with a top width of 9 feet and depth of 3 feet below existing grade.

Freshwater drainage culverts. Two new drainage culverts would be installed through the setback berm, to convey surface runoff and groundwater from the dunes and forested wetland area to the restored tidal wetland.

Preserve and restore forested wetland and coniferous dune habitat. As with the full tidal alternative, habitats behind (to the west of) the constructed setback berm would be preserved and restored under this alternative (Figure 4-5). Approximately 10 acres of high quality forested wetland and freshwater marsh habitat would be preserved and managed to remove noxious invasive species, while an additional 5 acres of forested wetland would be planted adjacent to existing forested wetland, in areas that are currently upland pasture or agricultural wetlands. Upland pasture areas would likely be graded to wetland elevations prior to planting.

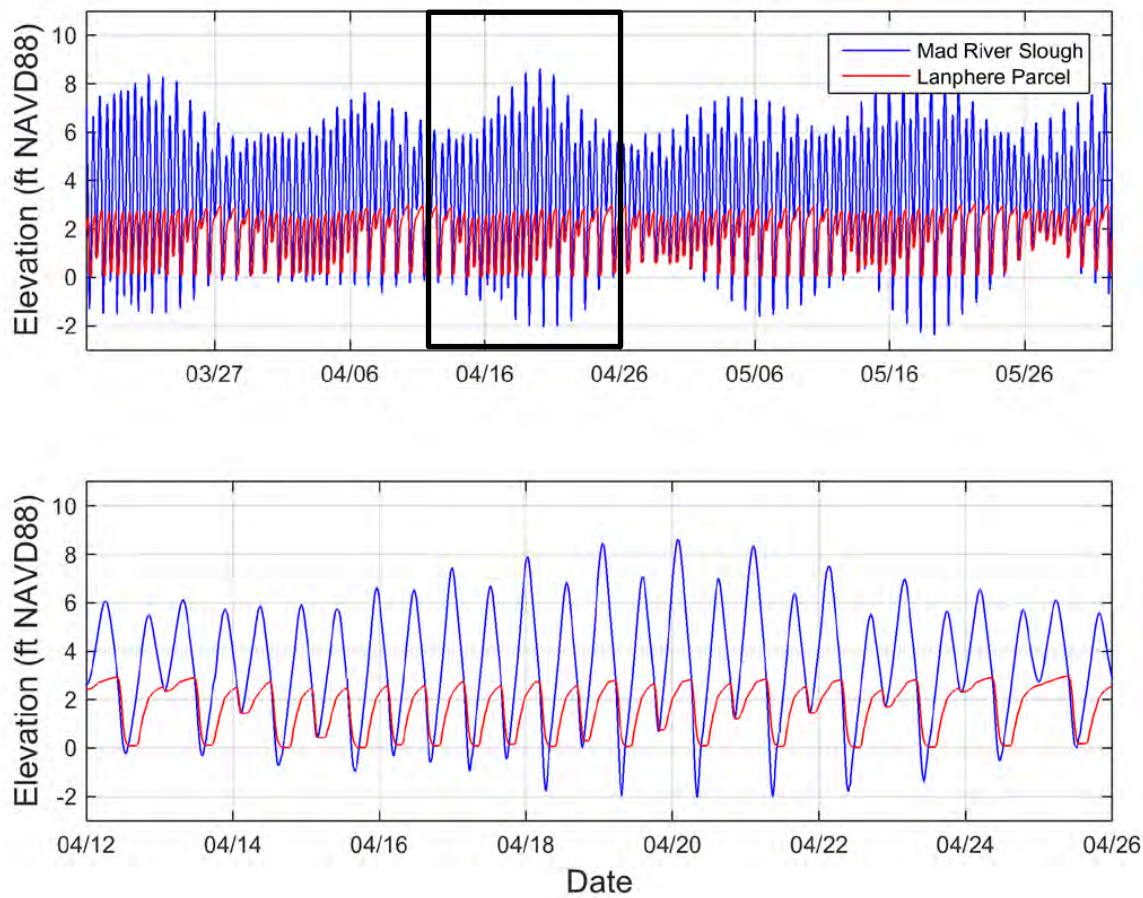
Additionally, the approximately 1 acre relic dune situated west of the setback levee would be restored as an upland buffer from nonnative annual grassland to coniferous dune forest (beach pine forest vegetation alliance).

4.2.3. Basis of Design

4.2.3.1. HYDRAULIC DESIGN CRITERIA

The fundamental hydraulic design criterion for a tidal wetland restoration site is to match the inundation characteristics (e.g., tide range, period of inundation) of an adjacent natural system. Providing a similar inundation regime (along with appropriate site elevations) would provide the restoration site with the optimal template to establish comparable habitat types to the surrounding environment. AECOM evaluated the inundation characteristics within MRS and estimated that bed elevations which are exposed to tidal inundation approximately 0 to 26 percent of the time would support salt marsh vegetation (Attachment D). Examination of site topography within the restorable area of the Lanphere parcel (primarily the existing pasture area) indicated that typical site elevations are in the range of 2 to 4 feet NAVD88. Therefore, the hydraulic design criterion for the muted tidal restoration alternative is to achieve a muted tidal regime within the project site that exposes the existing 2 to 4 feet NAVD88 elevation range to inundation durations of less than 26 percent of the time.

The large tide range in MRS (approximately 8.2 feet) would require substantial muting to produce the desired water level fluctuations and inundation characteristics in the restoration area. AECOM conducted hydraulic modeling of the muted tidal alternative to evaluate water levels under daily and extreme tides for existing and future conditions with sea level rise and a combined high tide-precipitation event. The muted tide range would be approximately 2.6 feet, and typical daily high tides would reach approximately 2.8 feet NAVD88 under existing conditions (Figure 4-8 and Table 4-6). The muted tide range would be approximately 1.9 feet, and typical daily high tides would reach approximately 3.2 feet NAVD88 under future conditions with 19 inches of sea level rise.



Source: AECOM 2015

Figure 4-8. Muted Tidal Simulation Results for Existing Daily Tide Conditions

Table 4-6. Summary of Muted Tidal Simulation Water Levels

Model Run	Water Surface Elevation (feet NAVD88)						
	Forested Wetland	Muted Tidal Wetland					
	Max	Max	Min	High Tide (MHHW)	Mean Tide (MTL)	Low Tide (MLLW)	Range
Existing Conditions							
Daily tides	-	3.0	0.0	2.8	1.7	0.2	2.6
100-year extreme tide + 10-year precipitation	4.0	3.8	0.0	-	-	-	-
Future Conditions (+ 19-inch sea level rise)							
Daily tides	-	3.6	0.5	3.2	2.4	1.3	1.9
100-year extreme tide + 10-year precipitation	4.3	4.0	0.5	-	-	-	-

Notes:
MHHW = Mean Higher High Water; MTL = Mean Tide Level; MLLW = Mean Lower Low Water;
NAVD88 = North American Vertical Datum of 1988
Source: AECOM 2015

VEGETATION ESTABLISHMENT

The muted tidal restoration alternative would mute the tide range from 8.2 feet NAVD88 (in MRS) to approximately 2.5 feet within the Lanphere parcel. Vegetated marsh plain would be limited to a narrow elevation range from approximately 2.5 to 3.0 feet NAVD88—a band of only 0.5 foot compared to approximately 4 feet within MRS. The elevation range suitable for vegetated marsh plain would increase to 3.0 to 3.6 feet NAVD88 for future conditions with 19 inches of sea level rise.

Similar to the full tidal alternative, AECOM anticipates that salt marsh vegetation would naturally recruit quickly within appropriate elevations at the project site (described above) after appropriate hydrology and connectivity is established with MRS. It may be desirable to accelerate the process of vegetation development by also planting source "islands" of salt marsh vegetation consisting of plugs or sod of salt marsh plant species (including pickleweed, saltgrass, and marsh jaumea) to facilitate early vegetation colonization and reduce area for invasion by *Spartina*, with phased planting of additional appropriate native species into appropriate locations of the site to add to species diversity over time. Regardless of planting approach, *Spartina* would need to be controlled during the vegetation establishment period, as discussed in Section 4.1.5, under "Invasive Species Control."

Areas between the setback berm and the MRS levee that are higher than the high range of expected salt marsh vegetation colonization are anticipated to develop into transitional brackish wetland habitats, and the drainage of freshwater through the setback berm into this area of the site would be designed to support wetlands throughout these upper areas. Because there would be some uncertainty in the hydrology and relative salinity that would develop throughout this portion of the site under a muted tidal regime, it is recommended that planting of this area be conducted 1-2 years post-breach to tailor plantings to the established hydrology and salinity. Wax myrtle scrub, brackish marsh, and freshwater marsh may all be appropriate vegetation types to plant within different areas of this transitional wetland zone. The landside slope of the rehabilitated levee and the slopes and crest of the setback berm would be seeded with native grasses.

Behind the setback levee, expansion of forested wetland would follow methods described in Section 4.3.3 "Basis of Design" for the freshwater non-tidal alternative. Forested wetland restoration would involve minor grading in upland areas to be planted with forested wetland habitats, invasive plant control, and seeding and planting of native species. The relic dune would also be planted with appropriate native species to establish an upland dune forest.

4.2.4. Projected Site Evolution

AECOM did not perform a detailed evaluation of the projected site evolution for the muted tidal alternative. AECOM estimated projected site evolution for this alternative based on professional judgment, taking into consideration the hydraulic modeling results, existing site topography, and elevation ranges and inundation criteria for salt marsh vegetation establishment. The projected habitat acreages anticipated to develop in both the short and long term (5 to 50 years post-construction) for the muted tidal alternative are shown in Table 4-7 and are discussed next.

Table 4-7. Vegetated Salt Marsh Acreage Projections for Muted Tidal Alternative under Mid-Range Sea Level Rise Scenario

		Vegetated Salt Marsh Area Projections (acres)[2,3]					
Fill Option	**Habitat Type**	**Year 0 (Post-Construction)[2]**	**Year 10**	**Year 20**	**Year 30**	**Year 40**	**Year 50**
No fill	Mudflat Saltmarsh Transitional Brackish Wetland[4]	4 8 17	4 9 16	4 11 14	4 12 13	4 14 11	4 15 10
Re-contouring[1]	Mudflat Marsh Transitional Brackish Wetland[4]	2 17 10	2 17 10	2 17 10	2 17 10	2 17 10	2 17 10

Notes:
1. The re-contouring scenario assumes minor earthwork at the site to lower approximately 7 acres within the 3.0 to 3.5 feet NAVD88 elevation range to 2.5 to 3.0 feet NAVD88 and raise approximately 2 acres below 2.5 feet NAVD88 to the 2.5 to 3.0 feet NAVD88 elevation range.
2. A 2020 construction date was assumed for simplicity; marsh habitat acreages are the acreages suitable for marsh establishment based on elevation but do not take into account lag times for vegetation establishment.
3. Acreage changes over time assume a mid-range sea level rise scenario (19 inches sea level rise by 2070).
Source: AECOM 2015
4. Transitional brackish wetlands are expected to be supported by freshwater drainage and salt water head from muted tidal areas, and would be likely planted with wax myrtle scrub and brackish marsh plants 1-2 years post breach, after hydrology and salinity patterns have equilibrated.

AECOM estimates that in the absence of interior site grading, vegetated salt marsh initially could establish over an elevation range of 2.5 to 3.0 feet NAVD88, or approximately 8 acres of the restored area, with the remainder of the site interior becoming mudflat (approximately 4 acres) and brackish transitional wetland habitat (approximately 17 acres) which is anticipated to be supported by salt water head from tidal inundation in addition to freshwater drainage from the western portion of the site. The total salt marsh acreage could potentially be expanded with refinement of the water control structure operations through additional modeling. Future sea level rise would increase the elevation range suitable for vegetated marsh plain to 3.0 to 3.6 feet NAVD88 over time. Assuming natural sedimentation and accumulation of organic material from

marsh vegetation within the muted tidal restored site would keep pace with sea level rise, the area of vegetated salt marsh would increase over time as the tide frame moved upslope and would expand to encompass approximately 15 acres.

AECOM estimates that with minor site grading and re-contouring, the initial area of vegetated salt marsh could be increased to cover approximately 17 acres of the restored area, along with approximately 2 acres of intertidal mudflat and 10 acres of transitional brackish wetland in areas located higher than the salt marsh vegetation colonization elevation range. Assuming natural sedimentation and accumulation of organic material from marsh vegetation within the muted tidal restored site would keep pace with sea level rise, the area of vegetated salt marsh and total wetland would remain relatively constant over time. The area of vegetated marsh would remain constant under this hypothetical conceptual grading scenario; however, refinement of the grading plan could increase the initial acreage of salt marsh and would provide a transitional upland slope for landward migration with sea level rise in the future.

4.2.5. Design Considerations

FEASIBILITY OF MUTED TIDAL ALTERNATIVE

As discussed above, the hydraulic design criteria for the muted tidal restoration alternative are intended to achieve a muted tidal regime within the project site that would expose the existing 2 to 4 feet NAVD88 site elevations to inundation durations of 0 to 26 percent of the time. The first criterion—establishing a fluctuating tide range of 2 to 4 feet NAVD88—would be relatively easy to achieve through the appropriate sizing and placement of the intake and outlet culverts.

The second criterion—exposing the existing site elevations to saltwater inundation for less than 26 percent of the time—would be much harder to achieve because of the substantial muting of the MRS tide range. The elevation band of vegetated marsh plain within MRS is relatively narrow, occurring within an elevation range of approximately MHHW ± 2 feet. Because the muted tidal restoration alternative would compress the full tide range of MRS, the elevation band suitable for vegetated marsh plain would be similarly compressed from approximately 4 feet to 0.5 foot. Therefore, only a very narrow elevation band around 2.8 feet NAVD88 ± 0.25 feet would experience inundation characteristics suitable for vegetated marsh plain. Although other portions of the site may remain unvegetated, these areas would provide intertidal mudflat habitat.

Constructing a restored site template that would accommodate such a narrow hydraulic tolerance for success would be challenging and may require a sophisticated water control structure to allow adaptive management and trial and error to achieve the desired water

levels within the site. Sea level rise likely would make water level management within the site increasingly difficult over time.

SOURCES OF FILL

The conceptual restoration design for the muted tidal alternative requires substantially less fill than the full tidal alternative. The conceptual restoration design proposes placing approximately 11,000 cubic yards of fill to rehabilitate the existing levee and approximately 9,000 cubic yards of fill to construct the setback berm.

The tide range would be optimized to act over the existing ground elevations (approximately 2 to 4 feet NAVD88) after minor re-contouring of the site. Existing drainage ditches would be filled to accommodate the restoration effort, but additional fill would not be necessary because most of the habitat created would be intertidal and mudflats.

The proposed conceptual restoration plan conservatively assumes that fill material for the levee and setback berm would be imported from off-site. The feasibility of obtaining on-site fill material should be investigated in future stages of design. Use of on-site fill material would substantially lower construction costs.

INVASIVE SPECIES CONTROL

Because this alternative also would include enhancement of the forested wetland areas, the invasive species control efforts for the freshwater habitat areas would be similar to those discussed for the full tidal marsh restoration alternative.

Spartina presumably could invade any areas where salt marsh vegetation may establish under a muted tidal regime, because it tolerates a similarly wide range of tidal inundation frequency and duration compared to dominant native salt marsh plant species, such as saltgrass and pickleweed. Thus, a muted tidal alternative would require regular control of *Spartina* until native vegetation establishment is widespread throughout the area. Creating a muted tidal marsh with no fill primarily would result in mudflat habitat creation, which would not be supportive of *Spartina* establishment. Implementation of the muted tidal alternative likely would require less maintenance and control of *Spartina* than the full tidal marsh alternative because ground surface elevations would be lower, and potentially would be more saline and less oxygenated than those preferred by *Spartina* (Falenski 2007).

Long-term *Spartina* control and eradication measures would be the same as those outlined for the full tidal design alternative, discussed in Section 4.1.5.

OPPORTUNITIES FOR EELGRASS ESTABLISHMENT

Pacific Watershed Associates evaluated opportunities for establishing eelgrass within the restored Lanphere parcel under the muted tidal alternative (Pacific Watershed Associates 2015):

> *Absent further site specific studies, it is unclear how eelgrass would respond to a muted tidal regime at the Lanphere site. Unlike saltmarsh, which is principally constrained by the frequency of tidal inundation, eelgrass distribution is limited by light availability at depth (Dennison 1987), and by desiccation stress during low tides at the upper limits of its distribution (Boese et al. 2003). Eelgrass depth range increases as tidal range decreases because eelgrass at depth is more frequently exposed to sufficient light levels, while shallow eelgrass is exposed to dessication stress for shorter durations at low tide. For these reasons, there may be the potential to establish eelgrass at the project site under a muted tidal alternative, however; further modeling in conjunction with a site specific assessment of eelgrass depth distribution adjacent to the project area in upper Mad River Slough would be critical for informing channel design depths.*
>
> *Since the project area under existing topographic conditions would completely drain nearly every day, the channel network would need to be excavated to a depth sufficient to retain water during all but the lowest of low tides, targeting an approximate design depth centered around MLLW at the project site. It may be possible to excavate lower reaches of the intertidal drainage network sufficiently to retain water at low tide by establishing the invert elevation of the water control structure/culvert at an elevation higher than the channel bottom. It would be important to consider whether the impounding of water under this scenario could lead to deterioration of water quality due to reduced circulation and lack of complete flushing or increased thermal stress to such a degree that it precludes eelgrass survival.*

The conceptual restoration plan for the muted tidal alternative includes excavation of a 200-foot-long starter channel, extending to a depth of -1.0 foot NAVD88. The drainage culvert inverts would be at 0.0 foot NAVD88, and thus a portion of the starter channel would remain permanently inundated and potentially could support eelgrass. Off-channel subtidal areas could be excavated within the site to create additional habitat suitable for eelgrass

establishment; however, excavated off-channel areas may be subject to poor circulation and drainage, water quality issues, and fish stranding. These areas also would be likely to experience rapid sedimentation, which may limit sediment delivery to other parts of the site and delay evolution to vegetated marsh plain. Further investigations would be required to establish the optimal channel design depths and morphological configurations to support eelgrass within the restored site, and to determine whether eelgrass would be likely to persist under a muted tidal regime.

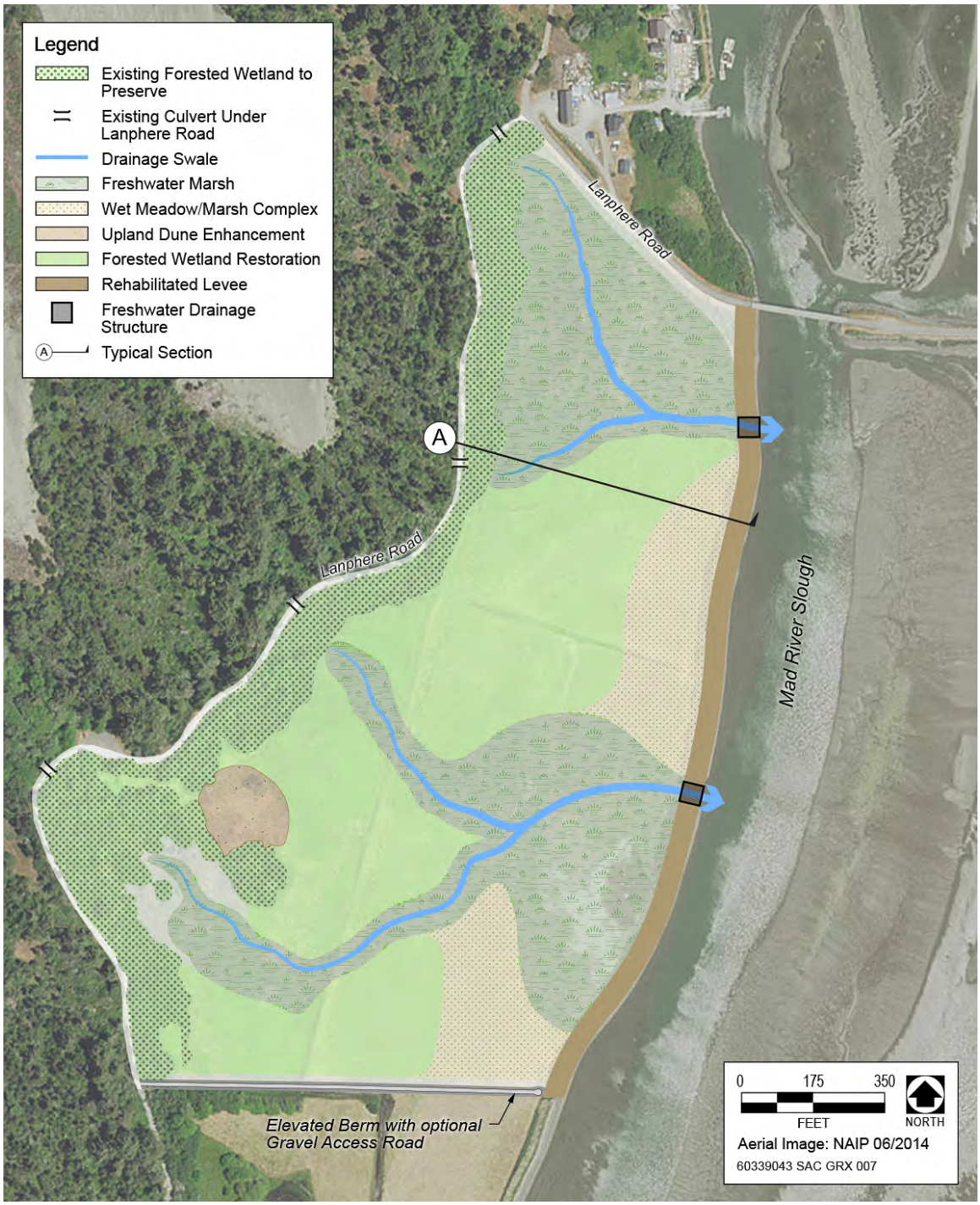
4.2.6. Ecological Functions and Values

Similar to the full tidal alternative and to the historical conditions, the muted tidal alternative would result in intertidal mudflat and vegetated tidal salt marsh habitats. Salt marsh vegetation would be expected to establish within the project site over a relatively narrow elevation range from approximately 2.5 to 3.0 feet NAVD88. Mudflats would provide the largest potential of any habitat type considered to buffer sea level rise because mudflats accrete sediment, and as sediment accretes over time, it would raise site elevations and expand vegetated intertidal marsh habitat. The rehabilitated MRS levee and reduced tidal flow may reduce sediment supply to the mudflats under a muted tidal regime and could effectively slow sediment accretion rates compared to the full tidal alternative. Natural biogeochemical processes would resume to some degree, but would be affected by discontinuity with the slough levee, and habitat continuity would not be fully restored. It is unclear whether eelgrass could be successfully established in the primary tidal channel under a muted tidal regime because of reduced tidal flushing under this alternative. Regardless, restoring the project site to the habitat types that historically were present would provide greater ecological function and value than a non-tidal or no project alternative, and would increase acreages of these relatively rare habitat types for the wildlife that depend on them. Although the water control infrastructure that this alternative would require would need maintenance in perpetuity, the habitats would become self-sustaining.

4.3. Freshwater Non-Tidal Alternative

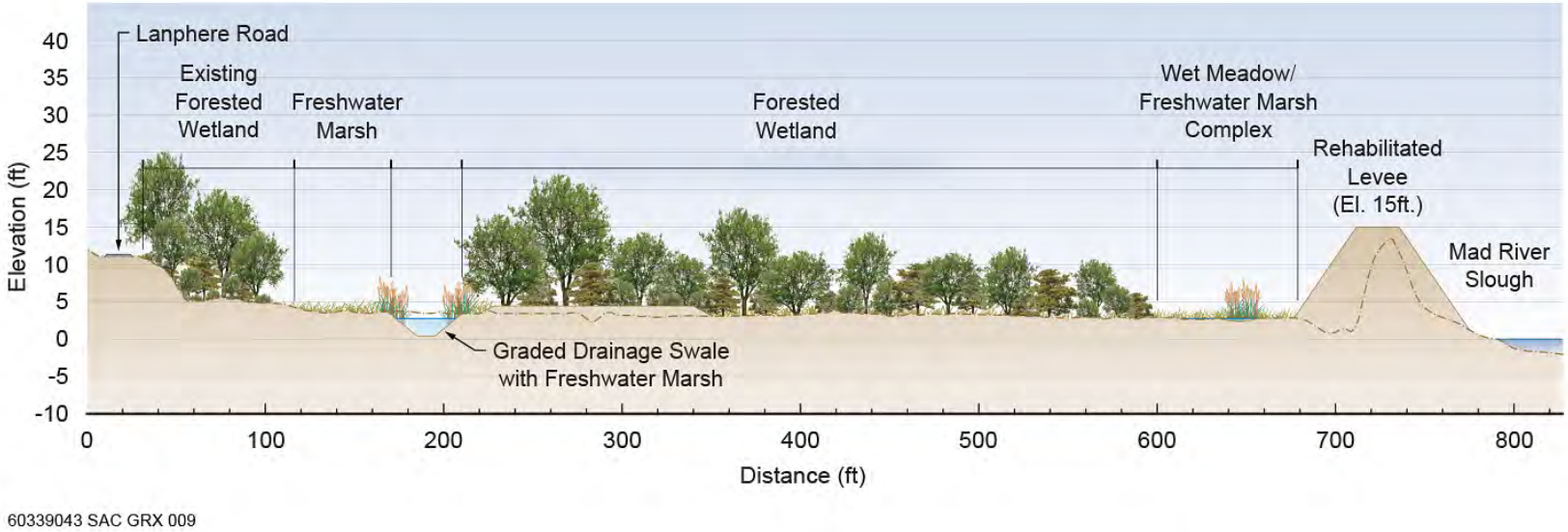
4.3.1. Conceptual Restoration Plan

A conceptual restoration plan for the freshwater non-tidal restoration alternative is shown in Figures 4-9 and 4-10. The conceptual restoration plan includes rehabilitating the existing levee, installing drainage structures to allow freshwater accumulated on site to drain to MRS, constructing a new low berm to protect the Ralph property from stormwater ponding, filling or modifying most of the existing drainage ditch network, grading natural drainage swales, and planting and enhancing freshwater marsh, wet meadow, and forested wetland vegetation throughout the project site.



Source: AECOM 2015

Figure 4-9. Conceptual Restoration Plan Layout – Freshwater Non-Tidal Alternative



Source: AECOM 2015

Figure 4-10. Conceptual Restoration Plan Cross Section – Freshwater Non-Tidal Alternative

4.3.2. Restoration Design Elements

The restoration design elements for the freshwater non-tidal alternative are described next.

Rehabilitate existing levee. The existing 2,000-foot levee would be rehabilitated to provide permanent flood protection to the Lanphere parcel. The levee rehabilitation would include placing rock riprap along the eroded slough side of the levee and new land side fill to increase the crest width, height, and stability of the existing levee (Figure 4-7).

Install drainage outlet structures. Two outlet water control structures would be installed in the rehabilitated levee to allow accumulated freshwater from precipitation and groundwater seepage from the site to drain into MRS. A substantial amount of freshwater seeps into the project area from the dune complex to the west, as evidenced by saturated soils through much of the project area despite the area having been actively managed to be drier for grazing. The proposed water control structures would consist of two culverts of approximately 2 to 4-foot diameter. A flap gate would be installed on the slough side of the culverts and a weir box would be installed on the Lanphere site of the culverts to provide increased flexibility in managing water levels within the site.

Construct low berm at parcel boundary. A low berm (approximately 3 feet above existing grade) would be constructed along the southern boundary of the restoration area to keep stormwater ponding at the project site from draining to the adjacent Ralph parcel. The berm would provide a suitable location for a gravel access road and cul-de-sac for improved site access during construction and maintenance, as shown on Figure 4-9.

Drainage swales. A simple network of four drainage swales would be excavated to drain the site from west to east, conveying runoff and shallow groundwater seepage to the outlet structures in the rehabilitated MRS levee, draining excess freshwater from the site to MRS. The drainage swales would be excavated approximately 1 to 3 feet below the adjacent grade, with a bottom width ranging from 4 to 15 feet, and would have gradual (5:1 or greater) side slopes. Small potholes and wider shallow swale margins would be incorporated where desirable to increase freshwater marsh habitat features and produce fill sources for other project elements.

Existing drainage ditches. The existing network of straight drainage ditches is proposed to be filled to the adjacent ground elevation, with the existing drainage network replaced by a more natural, shallow meandering network of drainage swales, as shown in Figure 4-9 and described above. Existing ditches are approximately 3 to 4 feet deep, with a typical top width of 15 feet.

Site grading and habitat layout. The site is expected to have a balanced grading plan, with no need to import fill from off-site, except for the engineered fill and rock required for rehabilitating the existing MRS levee. Excavating drainage swales and ponded freshwater marsh features, and slightly lowering elevations of upland areas, would provide fill for the low berm along the southern parcel boundary, filling existing ditches, and possibly raising some site elevations for topographical diversity and forested wetland planting. A detailed grading plan was not developed for the conceptual design; however, a 12,000-cubic yard allowance for interior on-site grading is included in the cost estimate.

4.3.3. Basis of Design

4.3.3.1. VEGETATION ESTABLISHMENT

Some natural recruitment of native freshwater marsh and forested wetland species would occur on the project site with cessation of grazing and grading of drainage swales and other freshwater marsh features, but the process would be slow, and it is assumed that under this alternative, the project site would be actively planted with native vegetation (Table 4-8). Willow and alder cuttings could be collected from nearby forested wetland areas to plant directly in areas to establish forested wetland and would be established without irrigation. Tules, sedges and rushes would be nursery grown and would be planted in wet meadow and freshwater marsh areas, while other herbaceous species, such as wet meadow grasses, would be seeded. Cattails would quickly colonize ponded wetland areas during the establishment period and would not require active planting. The landside slope of the rehabilitated levee would be seeded with native grasses.

In areas of the project area dominated by nonnative perennial pasture grasses or invasive Himalayan blackberry, weed control (selective herbicide application and/or disking of herbaceous weeds) would be appropriate before planting native vegetation. Areas with high extant cover of native plants would be mapped as part of the design process and would be marked for avoidance or lighter restoration treatment approaches, as appropriate.

4.3.4. Design Considerations

4.3.4.1. DESIRED HABITAT TYPES AND HYDROLOGY

The relative proportions of freshwater marsh, wet meadow, ponded open water, and forested wetland habitat types to be established on the site are flexible and could be modified to meet Caltrans objectives. The existing site topography is relatively flat, and most areas of the project site could support any of these habitat types with no or minimal grading. Furthermore, drainage swale design could incorporate small check gates to adaptively manage or adjust local site hydrology to increase or decrease the amount of ponding and soil saturation in different portions of the site.

Table 4-8. Conceptual Planting Palette for Freshwater Habitats

Common Name	Scientific Name	Lifeform	Habitat Type[1]
Hairgrass	*Deschampsia caespitosa*	Herbaceous	M
Tall flatsedge	*Cyperus eragrostis*	Herbaceous	M, FWM
Pale spikerush	*Eleocharis macrostachya*	Herbaceous	FWM
Creeping wildrye	*Elymus triticoides*	Herbaceous	M
Meadow barley	*Hordeum brachyantherum*	Herbaceous	M
Bolander's rush	*Juncus bolanderi*	Herbaceous	FWM
Pacific rush	*Juncus effusus* var. *pacificus*	Herbaceous	M, FWM
Water parsley	*Oenanthe sarmentosa*	Herbaceous	FWM
Silverweed	*Potentilla anserina*	Herbaceous	M, F
Tule	*Schoenoplectus acutus*	Herbaceous	FWM
Panicled bulrush	*Scirpus microcarpus*	Herbaceous	FWM
Cascara	*Frangula purshiana*	Shrub	F
Wax myrtle	*Morella californica*	Shrub	F
Pink-flowering currant	*Ribes sanguineum* var. *glutinosum*	Shrub	F
Salmonberry	*Rubus spectabilis*	Shrub	F
California blackberry	*Rubus ursinus*	Shrub	F
Hooker's willow	*Salix hookeriana*	Shrub	F
Red alder	*Alnus rubra*	Tree	F
Wild cucumber	*Marah oregonus*	Vine	F

Notes:
1. Habitat type codes: FWM = freshwater marsh; M = wet meadow; F = forested wetland.
Source: AECOM 2015

4.3.4.2. INVASIVE SPECIES CONTROL

This system would allow for the establishment of freshwater marsh habitat and enhancement of forested wetland habitat rather than saline tidal habitats that tend to be so easily invaded by *Spartina*, so that the need for *Spartina* control would be low. The invasion potential by species other than *Spartina* still would exist. Species likely to invade the site and require removal during the establishment phase would include Himalayan blackberry, reed canarygrass, French broom, English ivy, fennel, poison hemlock, perennial pepperweed, nonnative pasture grasses prevalent at the site, and others as discussed under the full tidal alternative. Project phasing and design would be timed in a manner to allow control of invasive species before installing plants. After restoration is completed, regular monitoring for these species and others that have the potential to establish should be conducted, and an invasive species management plan should be implemented for at least 4 years or until native species are well-established throughout the project area.

4.3.5. Ecological Functions and Values

This alternative includes enhancement and expansion of the forested wetland and freshwater marsh habitats, with no incorporation of the historical tidal marsh or mudflat

habitats. Ecological values would benefit avian, mammal, and freshwater invertebrate species. Nesting and foraging habitat for avian and mammalian species would be expanded, as well as the potential for rare plant communities to establish within the project site. The site would be designed and planting would be palette tailored, depending on the desired proportion of forested wetlands, herbaceous wetland, and open water habitats. However, the prevalence of forest fringe vegetation types would continue to differ between the project and reference sites, as it currently does.

Because sediment accretion would be limited under the freshwater non-tidal alternative, natural adjustment of the topography to sea level rise would be inhibited, which could have ecological implications in the distant future. As sea level rise gradually increases the elevation difference between surface water levels in MRS and the ground surface of the restored habitat areas, it could become more difficult to keep saltwater from intruding or seeping through as the hydraulic head during MHHW on the levee increases. Maintenance of the levee structures would be critical for the success of these habitats in perpetuity. In the long term, this alternative would be the least self-sustaining because a natural habitat buffer would not exist between saline and freshwater. Maintenance would be completely reliant on the maintenance and up-keep of the refurbished MRS levee and associated freshwater drainage structures.

Chapter 5. Estimated Implementation Costs

The cost estimates for the conceptual restoration alternatives are shown in Tables 5-1, 5-2, and 5-3. These construction cost estimates, prepared by AECOM, are based on a 10 percent level conceptual design. Unit costs were developed from bid results from similar projects (including White Slough in August 2015), similar AECOM project experience, and professional engineering judgment. Earthwork quantities were estimated using the ArcMap GIS software and spreadsheet calculations using the average end-area method. A 30 percent contingency was added to the cost estimates to account for uncertainty in design assumptions and unit costs. Estimated costs do not include costs for engineering design, environmental documentation, permitting, or contract and construction administration.

Table 5-1. Conceptual Level Cost Estimate—Full Tidal Alternative

Design Element	Unit	Quantity	Unit Cost	Cost
Mobilization/Demobilization	LS	1	10%	$327,283
Clearing and Grubbing	Acres	24	$500	$12,000
Fill Activities				
Fill drainage ditches	CY	8,200	$5	$41,000
New setback levee	CY	66,800	$18	$1,202,400
Place fill to raise site (low fill option)	CY	20,000	$5	$100,000
Total Fill	CY	95,000	-	-
Excavation Activities				
Levee breach	CY	580	$10	$5,800
Levee lowering	CY	700	$10	$7,000
Pilot channel	CY	10	$15	$150
Freshwater drainage ditch	CY	1,530	$5	$7,650
Interior starter channels	CY	3,350	$5	$16,750
Grading uplands to restore forested wetland behind setback levee	CY	3,500	$5	$17,500
Total Excavation	CY	9,670	-	-
Site preparation and Planting				
Pre-seeding Weed Management	Acre	6	$500	$8,000
Seed Bed Preparation	Acre	6	$4,000	$64,000
Planting and Seeding				
Saltmarsh Plugs installed in "Islands" of 200 plugs clusters spaced 1' O.C .	Each	46,000	$1	$46,000
Trees and Shrubs (containers)	Each	540	$35	$18,900
Seeding	Acre	6	$3,000	$18,000
Willow and alder cuttings	Each	420	$20	$8,400
Plant Establishment and Maintenance				
Site Inspection Events (5 years)	Each	60	$2,000	$120,000
Maintenance - Years 1 to 3	Lump Sum	3	$22,000	$66,000
Maintenance - Year 4	Lump Sum	1	$10,000	$10,000
Maintenance - Year 5	Lump Sum	1	$8,000	$8,000
Habitat Establishment Documentation (5 years annually)	Each	5	$2,000	$10,000
Other				
Riparian drainage culvert with flap gate	LS	2	$60,000	$120,000
Total Cut-Fill (Import fill from off-site)	CY	85,330	$16	$1,365,280
Sub-total				$3,600,000
Contingency			30%	$1,080,000
Total Estimated Construction Cost				**$4,680,000**
Optional Items				
High Fill Option				
Import fill from offsite	CY	50,000	$15	$750,000
Place fill to raise site	CY	50,000	$5	$250,000
High Fill Option Sub-Total				$1,000,000
Road-on-Levee				
Import additional fill	CY	14,300	$15	$214,500
Widen setback levee	CY	14,300	$18	$257,400
Gravel road on levee	SY	7,500	$10	$75,000
Road-On-Levee Subtotal				$547,000

Notes/Assumptions:
1. This construction cost estimate, prepared by AECOM, is based on 10% Design. This estimate is not a bid, but may be used as a planning tool to assess the level of effort required to construct and maintain the project. Competitive bidding, negotiations with the State, or fluctuations in market prices may affect actual project costs.
2. Unit costs for this estimate have been acquired from previous AECOM cost estimates and contractor bid item sheets. Site Preparation, Seeding and Maintenance costs have been estimated based on AECOM Project contractor bid item lists, which are large-scale projects also subject to prevailing wage requirements.
3. Erosion control seeding assumed to be part of MRS levee degrade and new setback levee construction costs, with no seedbed prep or pre-seeding weed control needed.
4. Saltmarsh plugs assumed to be planted on over 25% of the saltmarsh elevation areas (8.5 acres), spaced 1-ft O.C. in 200-plug cluster “islands” (islands occupy appx ½ of the 25%, approximately 5400 plugs per acre of saltmarsh habitat area) = 46,000 plugs.
5. Pre-seeding weed management, seedbed prep, and seeding costs may apply to this alternative in forested wetland restoration area.
6. Trees and shrubs containers and or cuttings would be planted on 6 acres of forested wetland and 1 acre of dune forest in the appropriate areas for each species, with trees spaced on average 25-ft O.C. (appx 70 trees/acre).
7. Willow and alder cuttings could be collected from nearby forested wetland areas. Cuttings 4' Length (densely planted in 3' spacing in two alternate rows in groups).
8. Inspections 2 times/month for 6-months of each year.
9. Invasive weed control measures may require 2 actions/month as needed for 1st 3 years (hand pulling, spot-spraying, shallow grinding (Spartina), or flaming invasive plants as needed).
10. Habitat establishment documentation includes annual site visits and forms to record plant establishment operations and annual record drawings of plant installation and establishment.

Table 5-2. Conceptual Level Cost Estimate—Muted Tidal Alternative

Design Element	Unit	Quantity	Unit Cost	Cost
Mobilization/Demobilization	LS	1	10%	$264,469
Clearing and Grubbing	acres	30	$500	$15,000
Fill Activities				
Fill ditches	CY	8,208	$5	$41,040
New setback berm	CY	9,164	$18	$164,952
Interior Site Grading	CY	5,000	$5	$25,000
Rehabilitate Existing Levee				
Dewatering and foundation	LS	1	-	$50,000
Clearing, grubbing, and stripping	SY	6,000	$15	$90,000
Levee fill placement	CY	10,930	$20	$218,600
Rock/rubble placement	CY	5,000	$50	$250,000
Filter fabric	SY	5,000	$5	$25,000
Total fill	CY	38,302	-	-
Excavation Activities				
Freshwater drainage ditch	CY	1,500	$5	$7,500
Interior starter channels	CY	230	$5	$1,150
Grading uplands to restore forested wetland behind setback levee	CY	3,500	$5	$17,500
Total excavation	CY	5,230	-	-
Water Control Structures				
Drainage culvert with flap gate	LS	2	$60,000	$120,000
Intake/Outlet structure	LS	2	$200,000	$400,000
Total Cut-Fill (Import fill from off-site)	CY	33,072	$16	$529,152
Site Preparation				
Pre-seeding Weed Management	Acre	16	$500	$8,000
Seed Bed Preparation	Acre	16	$4,000	$64,000
Planting and Seeding				
Saltmarsh and transitional brackish marsh plugs installed in "Islands" of 200 plugs clusters spaced 1' O.C .	Each	119,000	$1	$119,000
Trees and Shrubs (containers)	Each	1,000	$35	$35,000
Seeding	Acre	16	$3,000	$48,000
Willow and alder cuttings	Each	490	$20	$9,800
Plant Establishment Maintenance (5-year period)				
Site Inspection Events 1 and 2 years	Each	120	$2,000	$240,000
Site Inspection Events 3 to 5 years	Each	36	$2,000	$72,000
Maintenance - Years 1 to 3	Lump Sum	3	$22,000	$66,000
Maintenance - Year 4	Lump Sum	1	$10,000	$10,000
Maintenance - Year 5	Lump Sum	1	$8,000	$8,000
Habitat Establishment Documentation (5 years annually)	Each	5	$2,000	$10,000
Sub-total				$2,909,000
Contingency			30%	$873,000
Total Estimated Construction Cost				**$3,782,000**
Optional Items				
Road-on-Berm				
Import additional fill	CY	8,400	$15	$126,000
Widen setback berm	CY	8,400	$18	$151,200
Gravel road on berm	CY	6,100	$10	$61,000
Road-on-Berm Subtotal				$338,000

Notes/Assumptions:
1. This construction cost estimate, prepared by AECOM, is based on 10% Design. This estimate is not a bid, but may be used as a planning tool to assess the level of effort required to construct and maintain the project. Competitive bidding, negotiations with the State, or fluctuations in market prices may affect actual project costs.
2. Unit costs for this estimate have been acquired from previous AECOM cost estimates and contractor bid item sheets. Site Preparation, Seeding and Maintenance costs have been estimated based on AECOM Project contractor bid item lists, which are large-scale projects also subject to prevailing wage requirements.
3. Erosion control seeding assumed to be part of MRS levee degrade and new setback berm construction costs, with no seedbed prep or pre-seeding weed control needed.
4. Pre-seeding weed management, seedbed prep, and seeding costs may apply to this alternative in forested wetland and brackish wetland transition areas.
5. Saltmarsh and transitional brackish marsh plugs assumed to be planted on over 25% of the 17-acre saltmarsh elevation areas plus 5 acres of brackish marsh areas, spaced 1-ft O.C. in 200-plug cluster “islands” (islands occupy appx ½ of the 25%, 4.25-acre planted area); total plugs = appx 119,000 plugs.
6. Trees and shrubs containers and or cuttings would be planted on approximately 6 acres of forested wetland, 5 acres of wax myrtle scrub wetland and 1 acre of dune forest in the appropriate areas for each species, with trees spaced on average 25-ft O.C. (appx 70 trees/acre).
7. Willow and alder cuttings could be collected from nearby forested wetland areas. Cuttings 4' Length (densely planted in 3' spacing in two alternate rows in groups).
8.Inspections 4x/month for 6-months of each year in Years 1 & 2, and 2 times/month in Years 3-5.
9. Invasive weed control measures may require 2 actions/month as needed for 1st 3 years (hand pulling, spot-spraying, shallow grinding (Spartina), or flaming invasive plants as needed).
10. Habitat establishment documentation includes annual site visits and forms to record plant establishment operations and annual record drawings of plant installation and establishment.

Table 5-3. Conceptual Level Cost Estimate—Freshwater Non-Tidal Alternative

Design Element	Unit	Quantity	Unit Cost	Cost
Mobilization/Demobilization	LS	1	10%	$171,399
Clearing and Grubbing	acres	20	$500	$10,000
Fill and Excavation Activities				
Fill ditches	CY	8,208	$5	$41,040
New Ralph property berm	CY	800	$18	$14,400
Interior Site Grading	CY	15,500	$5	$77,500
Rehabilitate existing levee				
Dewatering and foundation	LS	1	-	$50,000
Clearing, grubbing, and stripping	SY	6,000	$15	$90,000
Levee fill placement	CY	10,930	$20	$218,600
Rock/rubble placement	CY	5,000	$50	$250,000
Filter fabric	SY	5,000	$5	$25,000
Water Control Structures				
Freshwater drainage structures in MRS levee	LS	2	$45,000	$90,000
Checkgates in drainage swale(s)	LS	3	$5,000	$15,000
Access Road				
Gravel road	SY	1,070	$10.00	$10,700
Site preparation and Planting				
Pre-seeding Weed Management	Acre	20	$500	$10,000
Seed Bed Preparation	Acre	20	$4,000	$80,000
Planting and Seeding				
Freshwater Marsh/Wet Meadow Plugs installed in "Islands" of 200 plugs spaced 1' O.C .	Each	102,500	$1	$102,500
Trees and Shrubs (containers)	Each	1,550	$35	$54,250
Willow and alder cuttings	Each	1,200	$20	$24,000
Seeding	Acre	20	$3,000	$60,000
Plant Establishment Maintenance (5-year period)				
Site Inspection Events 1 and 2 years	Each	120	$2,000	$240,000
Site Inspection Events 3 to 5 years	Each	36	$2,000	$72,000
Maintenance - Years 1 to 3	Lump Sum	3	$44,000	$132,000
Maintenance - Year 4	Lump Sum	1	$12,000	$12,000
Maintenance - Year 5	Lump Sum	1	$10,000	$10,000
Habitat Establishment Documentation (5 years annually)	Each	5	$5,000	$25,000
Sub-total				$1,885,000
Contingency			30%	$566,000
Total Estimated Construction Cost				**$2,451,000**

Notes/Assumptions:
1. This construction cost estimate, prepared by AECOM, is based on 10% Design. This estimate is not a bid, but may be used as a planning tool to assess the level of effort required to construct and maintain the project. Competitive bidding, negotiations with the State, or fluctuations in market prices may affect actual project costs.
2. Unit costs for this estimate have been acquired from previous AECOM cost estimates and contractor bid item sheets. Site Preparation, Seeding and Maintenance costs have been estimated based on AECOM Project contractor bid item lists, which are large-scale projects also subject to prevailing wage requirements.
3. Erosion control seeding assumed to be part of MRS levee repair construction costs.
4. Pre-seeding weed management, seedbed prep, and seeding costs may apply to this alternative in forested wetland and wet meadow restoration areas; seeding would not occur in areas to be planted as Freshwater Marsh.
5. Trees and shrubs containers and or cuttings would be planted on 16-acres of forested wetland and 1 acre of dune forest in the appropriate areas for each species, with trees spaced on average 25-ft O.C. (appx 70 trees/acre).
6. Willow and alder cuttings could be collected from nearby forested wetland areas. Cuttings 4' Length (densely planted in 3' spacing in two alternate rows in groups).
7. Freshwater Marsh plugs assumed to be planted on over 25% of the 19-acre freshwater marsh/wet meadowrestoration areas, spaced 1-ft O.C. in 200-plug cluster “islands” (islands occupy appx ½ of the 25%, 4-acre planted area); total plugs = appx 87,000 plugs.
8. Inspections could occur 4 times /month for 6-months of each year in Years 1 & 2, and 2 times /month in Years 3-5.
9. Invasive weed control measures may require 4 actions/month as needed for 1st 3 years (either hand pulling, mowing, spot-spraying, digging up, or flaming invasive plants as needed).
10. Habitat establishment documentation includes annual site visits and forms to record plant establishment operations and annual record drawings of plant installation and establishment.

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Chapter 6. Summary of Design Alternatives and Conclusions

6.1. Summary of Design Alternatives

Each of the three project alternatives considered would provide significant and substantial increases in ecological functions and values provided by the Lanphere parcel and increases in important wetland types (tidal marsh and/or forested wetland) that have become exceedingly scarce in the Humboldt Bay region. Comparisons of the habitat acreages restored and preserved, and the objectives, benefits and constraints of the three conceptual restoration design alternatives proposed for the project area are shown in Tables 6-1 and 6-2, respectively, and discussed next.

6.1.1. Full Tidal Alternative

Breaching the MRS levee to the project site would restore hydrologic connectivity with MRS and would reestablish historical (i.e., full tidal) hydrology and habitat types (i.e., salt marsh, intertidal mudflats, and subtidal open water channel networks). Mudflat habitats are succeeded over time by salt marsh habitats, depending on natural accretion rates (i.e., sedimentation and organic accumulation); therefore, they would readily self-adjust to sea level rise and would provide a buffer to adjacent communities that could be negatively affected by sea level rise. Intertidal mudflat and salt marsh habitats would provide rearing habitat for fish and other aquatic species; foraging habitat for fish, birds and mammals; and would tend to be nutrient-rich, supporting low-trophic productivity (i.e., zooplankton, phytoplankton, and algae production). Restoring hydrologic connectivity with MRS would allow fish species to benefit and may provide a good opportunity to establish eelgrass in subtidal channels.

Because the site is relatively low elevation in relation to sea level in Humboldt Bay (2 to 4 feet NAVD mean tide level [MTL +/- 1 foot]), importing fill to raise site elevations would promote early salt marsh vegetation establishment. If no fill is imported, then the habitat restoration effort would result in primarily tidal mudflat creation initially, with increases in area vegetated with salt marsh over time due to natural sediment accretion. Although mudflats are unvegetated, they tend to be highly productive and support vast clam beds and algal mats, which are important food sources for fish and invertebrates; provide housing for invertebrates and large annelid species that shorebirds forage on; and promote zooplankton and phytoplankton populations. By far, the largest design constraint and potential cost for the full tidal alternative is associated with importation and handling

Table 6-1. Comparison of Design Alternatives—Restored Habitat Acreages

Habitat type	Full Tidal - low fill (acres)	Full Tidal - no fill (acres)	Muted Tidal - recontoured (acres)	Freshwater Non-Tidal (acres)
Salt marsh	8 (Yr 10) - 27 (Yr 30)	3 (Yr 10) - 27 (Yr 30)	17	0
Mudflat	21 (Yr 10) - 3 (Yr 30)	27 (Yr 10) - 3 (Yr 30)	2	0
Brackish transitional wetland (marsh, wax myrtle scrub)	0	0	10	0
Freshwater marsh and freshwater marsh/wet meadow complex	0	0	0	18
Forested wetland	5	5	5	17
Coniferous dune forest (upland buffer)	1	1	1	1
Total restored wetland acres at Year 10	*13 (plus 21 ac mudflat)*	*8 (plus 27 ac mudflat)*	*32 (plus 2 ac mudflat)*	*35*
Total restored wetland acres at Year 30	*32 (plus 3 ac mudflat)*	*32 (plus 3 ac mudflat)*	*32 (plus 2 ac mudflat)*	*35*
Preserved freshwater forested wetland	8	8	8	8
Preserved freshwater marsh	1	1	1	2

Notes:
Acreages of restored and preserved habitat types are approximate, conceptual-level estimates and are subject to change with design refinements and more detailed site mapping.
Upland buffer habitats that may be restored on levees/berms not included.

Table 6-2. Comparison of Design Alternatives—Objectives, Benefits, and Limitations

	Full Tidal	Muted Tidal	Freshwater Non-Tidal
Design Objectives	• Restore to historical full tidal marsh conditions • Breach and lower segment of existing levee to restore hydraulic connectivity to MRS • Repurpose existing levee as a wave break to promote marsh sediment accretion • Recreate historical habitats: salt marsh, intertidal mudflats and subtidal open water habitat • Construct a setback levee to protect freshwater habitats and adjacent landowner • Preserve and expand forested wetland areas west of setback levee • Create tidal channel network • Create freshwater drainage infrastructure • Recontour tidal areas: high, low, and balanced fill volume options	• Rehabilitate existing MRS levee and install water control structures to partially restore hydraulic connectivity to MRS • Construct a setback berm • Create muted tidal marsh conditions • Recreate historical habitats: salt marsh, intertidal mudflats, subtidal open water, and brackish transitional wetlands • Preserve and expand forested wetland west of setback berm • Create a tidal channel network • Include freshwater drainage infrastructure • Recontour site with balanced cut and fill	• Rehabilitate existing MRS levee and protect the site from salt water intrusion • Construct a setback berm to protect the Ralph property from stormwater flooding • Preserve and expand forested wetland areas • Preserve and expand freshwater marsh and open water habitats • Create freshwater drainage swales and infrastructure to MRS • Recontour site with balanced cut and fill
Benefits Common to All Alternatives	• Protect existing riparian corridor and Lanphere Road from saltwater intrusion • Convert agricultural pasture to diverse natural habitats • Protect Ralph parcel and west side freshwater habitats from flood potential caused by MRS levee breach • Restore coniferous dune forest on relic dune • Net gain in wetland function and ecosystem benefits		
Additional Benefits of Individual Alternatives	• Would have greatest potential to be self-sustaining with sea level rise • Would allow restoration similar to historical conditions • Would have high potential for eelgrass establishment • Would allow habitats to self-adjust to natural sediment accretion and sea level rise • Would buffer effects of sea level rise on adjacent habitats • Would not require costly refurbishing of the degraded MRS levee	• Would restore habitats present historically • Would have more limited potential for eel grass establishment • Would provide buffer effects of sea level rise on adjacent habitats • Would not require active planting of salt marsh • Would expand habitat for salt water invertebrates, zooplankton, and algae; nesting and foraging habitat for mammals and birds • Less fill required for levee/berm construction than full tidal alternative	• Would increase habitat acreage that could support herbaceous freshwater and upland rare plant communities • Would expand habitat for freshwater invertebrates, and nesting and foraging habitat for small mammals and birds • Would increases the forested wetland corridor between the dunes and MRS • Would not require fill to raise plain topography

Table 6-2. Comparison of Design Alternatives—Objectives, Benefits, and Limitations

	Full Tidal	Muted Tidal	Freshwater Non-Tidal
	• Would not require active planting of salt marsh vegetation • Would expand habitat for salt water invertebrates, zooplankton, and algae; rearing and foraging fish habitat; nesting and foraging habitat for mammals and birds • Would require less maintenance costs associated with the setback levee than with maintaining the existing MRS levee because much less wave erosion potential	• Would not require fill to raise plain to higher level to allow for initial salt marsh colonization	
Constraints and Limitations	• Availability, cost, and quality of fill for setback levee construction, and optional fill to promote early salt marsh colonization • Would require intensive control of invasive *Spartina* initially • Monitoring/control of *Spartina* would be desirable in the long-term as mudflat accretion converts to salt marsh • Maintenance of the setback levee and freshwater drainage infrastructure would be required in perpetuity	• Availability, cost and quality of fill for levee/berm construction • Would require refurbishing the degraded MRS levee • Would require the most infrastructure construction (setback berm, freshwater drainage infrastructure, hydraulic water control structure, refurbished MRS levee) • Would requires the most extensive maintenance and continued operation of infrastructure in perpetuity • Would require intensive control of invasive *Spartina* initially • Monitoring/control of *Spartina* would be desirable in the long-term as mudflat accretion converts to salt marsh •	• Availability, cost and quality of fill for levee/berm construction • Would require refurbishing the degraded MRS levee • Would require maintenance in perpetuity of the MRS levee, setback berm, and freshwater drainage infrastructure • Would be less likely to be self-sustaining long term with sea level rise • Would offer no potential for eelgrass establishment • Would require active planting • Would require monitoring/control of a wide variety of invasive species
Estimated Costs	• Estimated construction cost: $4,680,000 (low-fill option)	• Estimated construction cost: $3,782,000	• Estimated construction cost: $2,451,000

of earth fill to construct a new setback levee around the western and southern boundaries of the site, and optionally to raise portions of the site to promote early marsh vegetation colonization. The setback levee would be necessary to protect the high quality forested freshwater wetland habitat on the western portion of the site from tidal inundation and type conversion, and also to protect Lanphere Road (sections of which are below high tide levels) from tidal inundation. Placing fill within the site would be contingent on how much fill would be locally available and could be acquired for the site, and costs associated with acquisition and transportation of the fill material (the farthest potential fill source considered is 30 miles from the site). Other considerations related to fill availability and quality would be: project phasing, priority of other projects in the area requiring fill, soil suitability for levee/berm construction or vegetation establishment, and soil contamination. Depending on project phasing, fill may become available as needed, which could alleviate pressure to acquire the total fill volume at one time.

6.1.2. Muted Tidal Alternative

Muted tidal hydrology at the project site would include construction and maintenance of a setback berm (rather than a full flood control levee) along the forested wetland boundary and bordering the Ralph property to protect these areas from flooding and salt water intrusion. It also would include rehabilitating the existing MRS levee with hydraulic control structures to create a muted tidal hydrologic regime. Although historical hydrology (full tidal) would not be fully restored, creating muted tidal hydrology would partially restore historical habitat types including salt marsh, mudflat, and transitional brackish wetland habitats and provide for productive shorebird foraging areas, increased habitat values and improved wetland function. How eelgrass would respond to a muted tidal regime, and whether eelgrass habitat could be established on the fringe of the mudflats and subtidal channels under a muted tidal regime is unknown.

This alternative would require the most construction and maintenance of water control infrastructure. Not only would the existing MRS levee need to be rehabilitated, but a setback berm to protect the forested wetland and Ralph property would need to be constructed. Water control structures would be installed in the refurbished levee to control tide levels. As with the other alternatives, a freshwater drainage system would have to be constructed to convey and distribute freshwater coming from the dunes and flowing to MRS. In addition, a potential need would exist for fish screens or other passage structures to be included in the design, or fish species may become stranded on-site during low tide or may not be able to access the site at all. Muted tidal habitat restoration would allow a small daily tide range, creation of tidal and intertidal mudflat

habitat; however, continued maintenance and operations could be challenging with future sea level rise.

6.1.3. Freshwater Non-Tidal Alternative

If the tidal alternatives are deemed infeasible or undesirable, the highly degraded MRS levee could be rehabilitated and maintained, and the existing freshwater marsh and forested wetland habitats could be enhanced and expanded across the project site. Rather than restoring the historical hydrologic regime, under a freshwater non-tidal alternative, the current conditions would be greatly enhanced and agricultural pasture areas would be converted to structurally diverse wildlands. Habitat continuity would be expanded with the existing forest, freshwater marsh, and dune communities. This alternative primarily would benefit terrestrial species, freshwater invertebrates, and birds because no aquatic connectivity would exist between MRS and the project site other than freshwater drainage into the slough. The freshwater marsh and forest habitats would provide productive nesting, rearing, foraging and migratory corridor habitat for birds.

The project site land surface elevation has subsided over time, since the site was reclaimed for agriculture in the mid-1930s. Restoring the historical tidal habitats would lead to recovery from subsidence through natural sedimentation as a response to rising sea levels, whereas protecting the project site from hydrologic interaction with MRS would not allow natural sediment accretion. The natural adjustment of the site's topography to sea level rise would be inhibited and could have ecological implications in the distant future, if the levee is not maintained in perpetuity. However, in the event of a levee failure, forested wetland habitats would become skeletal forests, providing a valuable rookery site for shorebirds, and in-water habitat structure for aquatic species.

The main design consideration for the freshwater alternative is the long-term continued maintenance of the levee and freshwater drainage structures, which would be critical for the success and survival of these freshwater habitats. This alternative is somewhat less self-sustaining than other alternatives because the freshwater habitats would have no natural buffer to sea level rise and would not be able to persist without human-intervention and prevention of saltwater intrusion from MRS. However, the persistence of freshwater habitats in all three alternatives would be reliant on some maintenance and up-keep of a levee and associated freshwater drainage structures.

6.1.4. Benefits and Constraints Common among All Alternatives

Each of the three design alternatives would provide significant ecological lift and increase in wetland function within the upland pasture and grazed agricultural wetlands

of the project site. All of the design alternatives furthermore include protection and enhancement of the freshwater forested wetland and dune forests along the western boundary of the project site, which would provide quality nesting and foraging habitat for birds and mammals, and habitat for rare plant communities. Some inclusion and long-term maintenance of freshwater drainage structures would be needed to drain freshwater from the western portion of the project site (full and muted tidal alternatives) or from the entire project site (freshwater non-tidal alternative). Similarly, all three alternatives include elements to protect the Ralph property to the south and low portions of Lanphere Road along the western boundary from tidal or freshwater inundation by either rehabilitating the MRS levee or constructing setback levees or berms.

6.2. Conclusions and Recommendations

In summary, the full tidal conceptual alternative is the most historically appropriate and likely most sustainable restoration alternative over the long term, of the three conceptual alternatives presented. However, it also would be the most costly alternative to construct because of substantial fill importation requirements, primarily due to the inclusion of the setback levee to protect forested wetlands and Lanphere Road from tidal inundation. It also remains to be determined whether a full tidal alternative (with significant acreage of mudflat restoration initially) would provide sufficient wetland mitigation credits to Caltrans under current USACE mitigation requirements. However, although mudflats are not vegetated wetland habitats, they provide abundant habitat and ecosystem benefits and serve as buffers to sea level rise, and in the long-term (e.g. 30 years post construction) the full tidal alternative is projected to provide similar acreages of vegetated wetland habitats as the other two alternatives due to predicted natural sediment accretion and vegetation colonization.

The muted tidal alternative would be less costly up front, compared to the full tidal alternative, with greater initial acreages of vegetated salt marsh and brackish transitional wetland habitat as proposed, but it would not provide the same long-term sustainability and benefits to aquatic species as those provided by the full tidal alternative.

The freshwater non-tidal alternative may be the least costly alternative to construct and would provide significant increase in wetland function, including restoration of greater acreages of forested wetland habitat; like salt marsh, forested wetland has become exceedingly scarce regionally compared to its historical distribution. While this alternative would create freshwater wetland habitat in a location that is not historically appropriate and would not contribute to increases in salt marsh and mudflat habitats, it would provide regionally needed ecological functions.

All three conceptual restoration alternatives would provide a substantial degree of ecological lift and improvement in habitat value, and long-term sustainability over the current conditions at the project area. In addition, all three alternatives provide greater access reliability and reduced flood risk to Lanphere Road, USFWS Refuge headquarters, and the private adjoining Ralph property. Further discussions with resource agencies and the USACE Regulatory Branch to determine the relative mitigation benefits afforded by the three alternatives and selection of the preferred design approach should occur before moving forward with additional and more detailed design of the preferred alternative.

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