



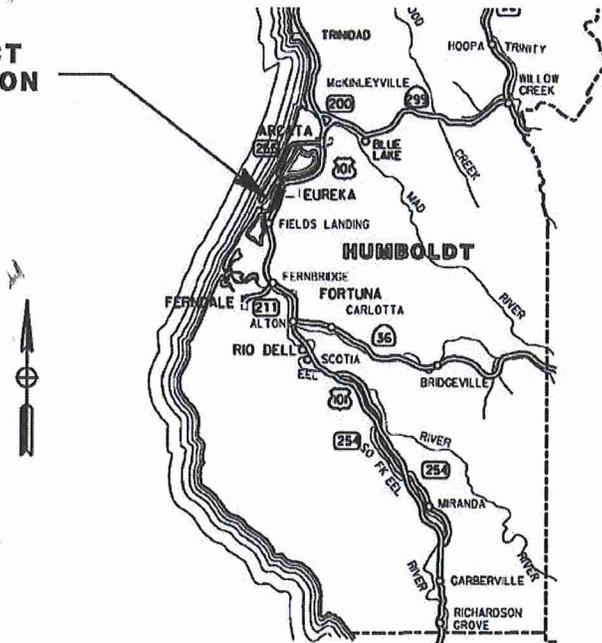
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JUNE 2014

# BROADWAY ENGINEERED FEASIBILITY STUDY

## PROJECT LOCATION



IN HUMBOLDT COUNTY IN EUREKA FROM 0.2 MILES  
SOUTH OF THE K MART ENTRANCE TO THE  
INTERSECTION OF BROADWAY AND 5<sup>TH</sup> STREET



Northbound traffic at Broadway/15<sup>th</sup> Street



Sidewalk north of Hawthorne Intersection

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*6/19/14*  
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# I. Executive Summary

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The Broadway Engineered Feasibility Study examines a range of future sustainable improvements to improve safety, operations, and mobility for pedestrians, bicycles, and vehicles. The study limits extend from the Kmart intersection to the beginning of the 4<sup>th</sup> and 5<sup>th</sup> Street couplet along US Highway 101 (US 101), also known as the Broadway corridor. The intent of this study is to provide a reference document that will be used as a guide for projects initiated in the future within the identified study limits. This study does not recommend or select a preferred improvement scenario for further project development.

A bypass of the Eureka downtown was initiated during the 1960's in cooperation with the City of Eureka, but ultimately the preferred route was rescinded due to environmental concerns, public input, and funding constraints. The absence of a bypass through Eureka has contributed to significant congestion in the corridor. Future improvements will accommodate traffic demand while making the most efficient use of the facility for all users. Traffic volumes must be managed with future improvements.

The Broadway corridor is marked by a significant number of vehicle/pedestrian collisions (1068 total collisions in the most recent 10 year period) and is one of the busiest corridors in District 1 (33,000 AADT). Congestion contributes to higher collision rates and vehicle volumes are projected to continue to increase into the future. The Purpose and Need (Section III) for this Engineered Feasibility Study (EFS), provides direction for improvement development as it relates to the issues present along the Broadway corridor. The methodology used for the EFS combines computer modeling, professional planning, and engineering judgment. The EFS has a technical focus utilizing microsimulation modeling to evaluate the effects of potential improvements in the Broadway corridor and surrounding areas of the City of Eureka.

The EFS considers the concerns and input expressed by various stakeholders including the public, business/property owners, emergency services, special interest organizations, disabled community, municipalities and elected officials. The EFS also incorporates recommendations from the Pedestrian and Bicycle Road Safety Audit (RSA) completed in 2008, a partnering effort between Caltrans District 1 Traffic Safety and the Federal Highway Administration (FHWA). In order to obtain stakeholder concerns and input the EFS hosted several public meetings to facilitate written comments regarding the potential improvements.

The EFS considered an initial set of scenarios (low, medium and high build) that were analyzed with the microsimulation modeling software. These three initial scenarios were presented in February 2012 at two meetings: 1) Business/Property Owner stakeholder meeting 2) Open Public Meeting. Based on the input received at the first two meetings in February 2012, the EFS team developed a revised set of six scenarios that attempted to best solve the issues along the Broadway corridor while considering the input received at the February 2012 meetings. In February 2014 a final public meeting was held to present the revised set of six scenarios and capture public comment/feedback. The written comments from all public meetings are summarized in Section VI of this report.

The final six scenarios include different combinations of the following improvements: traffic signal at Hawthorne Street, traffic signal at Clark Street, two options of raised median, additional right turn lane at Henderson Street, closure of northbound Fairfield Street, signal coordination, bike lanes, protected left turn phase for the minor legs at Wabash Avenue and 14<sup>th</sup> Street. A detailed description of each scenario is contained in Section VII of this report.

The results for the final six improvement scenarios studied as a part of this EFS were categorized across three subjects: safety, operations, and mobility. The traffic safety analysis shows evidence that replacing the two-way left turn lane with a raised median can reduce serious and minor injury collisions by 21% and property damage collisions by 33% within the corridor. Traffic signals at Hawthorne Street and Clark Street can facilitate safer pedestrian crossing of Broadway and have the potential to reduce collisions. A protected left turning movement for vehicles reduces the incidence of vehicle collisions with other vehicles, bicycles and pedestrians.

An additional right turn lane at the Henderson Street intersection and the closure of Fairfield Street will reduce travel time and vehicle emissions. The results presented in Section VIII should not be solely used to determine the “best improvement scenario”. Other improvement scenarios may be reviewed as new information becomes available to project teams. As project teams initiate future improvements the subjects of safety, operations and mobility will need to be prioritized to determine the scope of work that meets the identified need and purpose for that specific project.

Some additional recommendations for action moving forward as they relate to improvements along the corridor include: develop an access management plan, corridor focus meetings, and continuous calibration/updates to the microsimulation model (Section IX). An access management plan and/or focus meetings will attempt to address issues with property access and raised median. Ultimately, project teams will utilize this EFS as a resource of information when initiating/proposing features within the identified study limits. It is important to underscore this EFS is not a project and therefore is not tied to a funding source. This EFS will be a document that can be used to compete for available funding sources as projects are identified and initiated by project teams within Caltrans.

## II. Background

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### EUREKA FREEWAY HISTORY

#### Freeway Concept Origin

The original study for a bypass or freeway of US Highway 101 through Eureka began in April 1963 at the request of the Eureka City Council. The Eureka City Council requested the freeway planning be concurrent with the City's drafting of their General Plan. In September 1968 the first official public hearing was held by the Division of Highways (now Caltrans) to get formal input from the community. The hearing was attended by approximately 500 people. In 1970 a Memorandum of Agreement (MOA) was signed between the City of Eureka and Caltrans to study the freeway in concurrence with the City's Core Area Plan. In 1971, an Environmental Impact Report and a second MOA were approved designating the final design of the freeway and its relationship with Eureka's Core Area Plan.

Two additional hearings were held, followed by the City of Eureka and County of Humboldt executing a freeway agreement in April 1973. In order to comply with Section 106 of the Historic Preservation Act of 1966, an amendment was made to the freeway agreement to analyze all buildings of architectural or historical significance within the proposed right-of-way. The study identified 32 structures of significance, 23 were found to be structurally capable of being moved. Twelve buildings would be moved to a Victorian Village behind the Carson Mansion and the remaining eleven placed along Second Street west of the Carson Mansion. The Eureka Freeway project stalled during the 1970's due to reduced

gas tax revenues caused by high inflation and the oil embargo. Escalating construction costs and the new direction of the Governor's Administration limited new freeway construction projects. The Eureka Freeway project had difficulty getting funding and approval from the Transportation Director Adrianna Giantruco, who was appointed by Governor Jerry Brown. A Times Standard article from Wednesday June 22, 1977 states, "The Eureka Freeway project has not made it into the Department's 6 year plan since Gianturco became transportation director."

### Freeway Termination

In 1993 the City of Eureka requested Caltrans re-open the study on a Eureka Freeway. The resulting feasibility study looked at four alternatives that ranged in cost from \$225 million to \$350 million. The feasibility study concluded that a freeway could not be constructed on the adopted route without a re-study of all freeway alternatives and a new environmental document. The study also concluded the following: funding would not be available for the foreseeable future, the adopted route was now inappropriate to the context of the community, there is a lack of public support for a project of that scope, and funds received from the sale of purchased right-of-way could be used to fund non-freeway operational improvements. On December 8, 1993, a public meeting was held to discuss the adopted highway route. The public in attendance at the meeting unanimously opposed the adopted alternative. The City of Eureka and Caltrans agree to initiate termination of former agreements and request the California Transportation Commission to set aside state funds for relocation of Victorian homes and right-of-way for future transportation projects.

### 1995 PROJECT STUDY REPORT

On June 7, 1995, the adopted route for the proposed freeway project through the City of Eureka was rescinded by the California Transportation Commission. The Eureka City Council requested the rescission and the CTC agreed to consider using the sale of right-of-way properties to fund non-freeway projects within the City. The freeway was considered no longer viable because of environmental concerns, high costs, and a lack of public support.

### 1997 EUREKA NON-FREEWAY ALTERNATIVE PROJECTS STUDY

A steering committee composed of representatives of the County of Humboldt, City of Eureka, Humboldt County Association of Governments, and Caltrans identified 11 non-freeway projects that will enhance the safety and operation of US 101 (Figure 1).

Figure 1: Non-freeway Projects

Priority Number	Project Number	Project Description	1997 Cost (Millions)
1	5	4th and 5th at "V" Improvements	1.1
2	6	Henderson/Harris Intersection Improvements	2.3
3	4a	Waterfront Drive: Del Norte to Truesdale	5.3
4	3a	Extend 6th Across Eureka Slough	8.4
5	3	Extend 6th Across Eureka Slough, Extend Harrison Avenue North to 6th	12.4
6	10	Widen Broadway From Herrick to 5th, Adding through lanes	28.7
7	1	Realign 5th at R and 6th at Myrtle	2
8	7	Extend T Street South, Connecting to 7th at Myrtle	0.6
9	8	Bridge Over Humboldt Bay Between South Eureka and Samoa Peninsula	25.2
10	9	Bike Route Between Del Norte and Hilfiker Near Railroad Alignment	0.2
11	2	Extend Waterfront Drive: T Street to Y Street	3.1

## EXISTING FACILITY

US 101 is the primary highway route serving northern California and Oregon coastal areas. US 101 is a key west coast interstate transportation link that also serves as "Main Street" in Eureka; the southern portion (south of 4<sup>th</sup>/5<sup>th</sup> Street) is known as Broadway. Broadway is a high capacity urban principal four lane arterial with a continuous two-way left-turn lane that serves regional and interregional traffic. US 101 travels along Broadway and then splits into the 4<sup>th</sup> Street and 5<sup>th</sup> Street couplet. The City of Eureka also depends on local streets to move traffic through the city. Two local streets, Harris and Henderson, connect to Broadway and serve as high capacity urban roads (arterials) that move traffic across the Southside of Eureka. 6<sup>th</sup> Street, 7<sup>th</sup> Street, H Street, and I Street are all one-way streets. H Street and I Street are major arterials that carry traffic in a north/south direction from US 101 connecting to Harris/Henderson Streets. 6<sup>th</sup> and 7<sup>th</sup> Streets, which are classified as minor arterials, are parallel to 4<sup>th</sup> and 5<sup>th</sup> Streets and are important for traffic circulation.

## RELEVANT CALTRANS POLICIES AND PLANS

One goal of any Caltrans' project or study is to be consistent with existing federal and state laws, and all applicable internal Caltrans' policies. Policies that will be considered as projects are initiated in the future include: Caltrans Director Policies, California Transportation Plan 2035 and implementation policies, The Main Streets guide (2013), Caltrans Complete Streets design principles and Context Sensitive Solutions.

Some additional plans that will be considered include:

- California Transportation Plan (CTP) 2030 Addendum  
(Statewide, long-range transportation plan that guides transportation decisions and investments for the Interregional Improvement Program)
- Interregional Transportation Strategic Plan Status Update 2013  
(focuses on highways of interregional significance and provides a special focus on those routes when making transportation investment decisions)
- Route Concept Report (RCR)  
(long range planning document that describes Caltrans' conceptual highway improvement options for a 20 year period)

## CLIMATE CHANGE AND EXISTING ENVIRONMENT

### Caltrans' Directors Policy 30: Climate Change

Director's Policy 30 outlines the responsibilities of Caltrans staff to consider and implement climate change mitigation and adaptation. This study will consider the impacts of climate change with a focus on meeting the objectives of Executive Order S-13-08 directing state agencies with vulnerable construction projects to plan for sea level rise impacts. Due to the short-term scope and short-term design life of the improvements there will not be any anticipated impacts from sea level rise. The study will focus on climate change mitigation and the potential positive impact on vehicle emissions of different transportation improvement scenarios.

### Climate Change Mitigation

The Governor's Executive Order S-3-05 provides direction to address climate change in transportation projects. Climate Change is defined as the observed increase in global average temperature of the atmosphere and oceans causing changes in wind patterns, precipitation, and increasing the frequency of storms. Greenhouse gases are typically measured in terms of pounds of carbon dioxide or carbon dioxide equivalent. Reducing greenhouse gas emissions is an important consideration for when evaluating sustainable transportation improvements. Each scenario was evaluated based on relative greenhouse gas emissions versus if there were no improvements in the corridor. Greenhouse gas emission increases are based on the impact of traffic flow, the distance vehicles travel to their destination, and the benefits to reduction in fuel consumption. It is difficult to quantify the number of drivers or trips that might switch to bicycling under scenarios with designated bike lanes, so scenarios will be reviewed using a qualitative analysis of potential benefits.

## RELEVANT STUDIES

### Pedestrian and Bicycle Road Safety Audit

The objective of the study was to complete a pedestrian and bicycle road safety audit (RSA) that identified safety issues for bicycles and pedestrians. The audit noted there are sections of Broadway that have sidewalk gaps, variable shoulder widths, and changing speed limits. There were 85 pedestrian and

bicycle collisions in the study area in a 10 year period. The top three locations for pedestrian crossings are Washington Street, West Wabash Avenue, and McCullens Avenue. Two-thirds of the total pedestrian/bicycle collisions occurred during the day time when vehicles traveling straight encountered pedestrian/bicyclists, implying that drivers were not expecting non-motorized cross traffic movements. A total of nine safety issues were identified within RSA, which concluded that "continuity and connectivity of bicycle and pedestrian facilities is the most critical issue." The second most critical issue is long distances between crossings at intersections. The remaining seven issues for bicycle and pedestrian safety are: access control, safety issues for bicyclists, conflicts at pedestrian crossings, conflicts with two-way left-turn lane movements, accessibility restrictions, maintenance/drainage, and signage. This study will consider the safety of bicycles and pedestrians in the development of sustainable transportation improvements. The RSA recommends installing pedestrian crossings in the following locations: north of West Harris Street, Hawthorne Street, and Clark Street.

### III. Purpose and Need

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#### PURPOSE

The purpose of the feasibility study is to identify sustainable future improvements to enhance mobility for vehicles, pedestrians (both disabled and fully ambulatory), and bicycles within the corridor.

#### NEED

The collision rates for this segment of U.S. 101 reach more than 4 times the statewide average. The corridor experiences significant traffic congestion as well as poor mobility for vehicles, pedestrians and bicycles.

### IV. Methodology

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The EFS uses a combination of professional planning, engineering judgment and microsimulation modeling to evaluate different sustainable improvement scenarios within the study limits. The use of modeling has limitations that require additional consideration of the potential benefits to safety for pedestrians, bicycles, and vehicles.

#### IMPROVEMENTS ELIMINATED FROM CONSIDERATION

##### Roadway Widening

Research by Caltrans' staff shows that it is not feasible to widen Broadway in order to construct an additional travel lane in each direction to address issues with vehicle congestion. The concept is to widen Broadway to a 6 lane facility with 12 foot lanes, 12 foot raised median islands, 8 foot shoulders and 5 foot sidewalks. In order to construct these improvements, additional right-of-way and construction costs in the Broadway corridor would require approximately \$120,000,000 (estimate completed in 2007). This concept also does not meet the purpose and goal of enhancing mobility for pedestrians and

bicycles within the corridor. This concept would have significant impacts to businesses along the corridor and is not feasible for the purpose of this EFS.

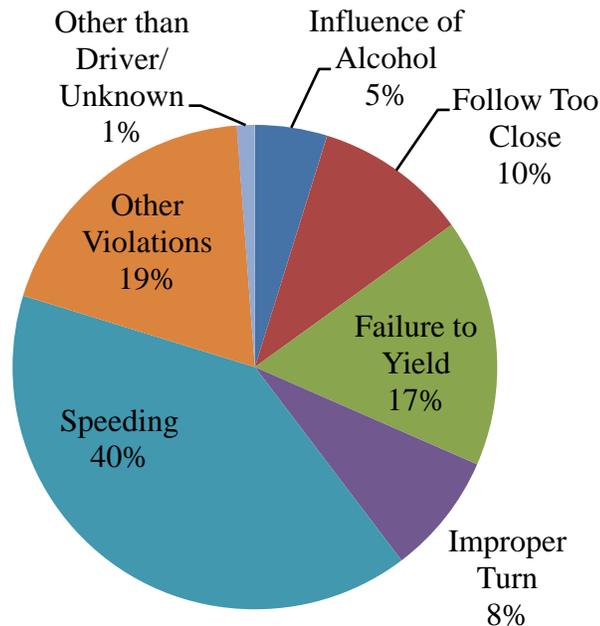
### Roundabout

In order to consider roundabouts within the corridor a Caltrans Intersection Control Evaluation (ICE) would need to be completed. The ICE was not completed for this EFS, but future intersection improvements on Broadway will need to incorporate the Departments ICE policy. The ICE process would assist project teams in the evaluation of whether roundabouts would improve safety and operations along the corridor. The cost of right-of-way, property acquisition, and utility relocation were the primary reasons roundabouts were eliminated from further consideration and determined not feasible for this EFS.

## TRAFFIC SAFETY

Safety is an important consideration that contributed to the need for this EFS. A long term collision analysis was completed for a 10 year period from 2002 to 2012 that identified 1068 total reported collisions in the corridor. Collision rates along the Broadway corridor are as high as 4 times the statewide average, which is attributed to congestion, driveway density, and the two-way left-turn lane with continuous openings. The 1068 total collisions along the corridor consist of the following severity: 507 injury, 554 property damage only, and 7 fatal. Pedestrians were involved in 3 of the 7 fatal collisions. Within the 1068 total collisions, 49 included pedestrians and 36 involved bicycles. Adverse weather conditions were determined not to be a major contributing factor with less than 20% of collisions occurring under wet conditions. Dark conditions were also eliminated as a major contributing factor with 81% of collisions occurring between 10:00 am and 7:00 pm. The primary factor contributing to vehicle collisions is speeding at 40% followed by "other violations" that include distracted driving at 19%. "Speeding" is used to classify vehicles that are traveling too fast for conditions, and the speeding classification does not necessarily represent vehicles exceeding the speed limit. Rear end collisions represent 54% of the total collisions and broadside collisions represent 22% of total collisions (Figure 3). A rear end collision represents two motor vehicles traveling in the same direction where one vehicle strikes the back of another vehicle. A broadside collision is defined as when one vehicle strikes another vehicle at an angle greater than a sideswipe. With over 125 driveways along the Broadway corridor and a continuous two-way left-turn lane there are significant conflict points that can lead to traffic collisions.

Figure 2: Primary Collision Factors on Broadway



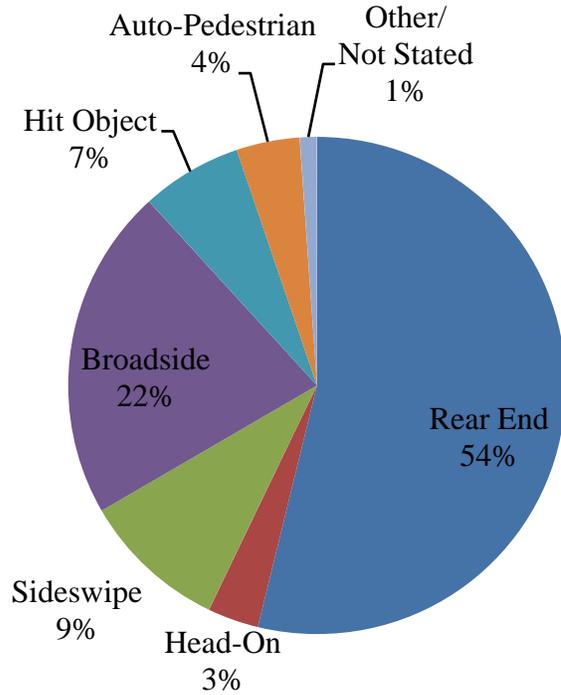
### Two Way Left Turn Lanes

Two-way left-turn lanes (TWLTL) are not recommended in situations where traffic volumes exceed 24,000 to 28,000 vehicles per day and there are a large number of driveways. There is evidence from transportation studies linking the number of driveways and median openings with an increase in number of vehicle collisions (NCHRP 420, 1999). The Annual Average Daily Traffic (AADT) along Broadway is currently 33,000 vehicles per day and is projected to reach 36,000 vehicles per day by the year 2020. The high volume contributes to the high number of vehicle collisions created by a large density of driveways and median openings. The common types of collisions associated with TWTWL: rear-end, sideswipe, right angle, left turn, head-on, and fixed parked vehicles.

### Intersections

Vehicles turning left at intersections are at higher risk than other turning movements. In the United States, 27 percent of all intersection-related crashes are associated with left turns, over two-thirds occurring at signalized intersections. The AADT at the Henderson Street and Wabash Avenue intersections is 38,800 and 33,000, respectively. Vehicles turning left have the potential to collide with the following: opposing through traffic, through traffic in the same direction, vehicles turning in the opposite direction, and pedestrian traffic. The collision history at Harris Street shows congestion related rear-end and broadside collisions for southbound traffic. At the Henderson Street intersection 59% of collisions are rear end. The collision history at the Wabash Avenue intersection is mainly attributed to congestion, and turning movement conflicts exist at the 14<sup>th</sup> Street intersection location.

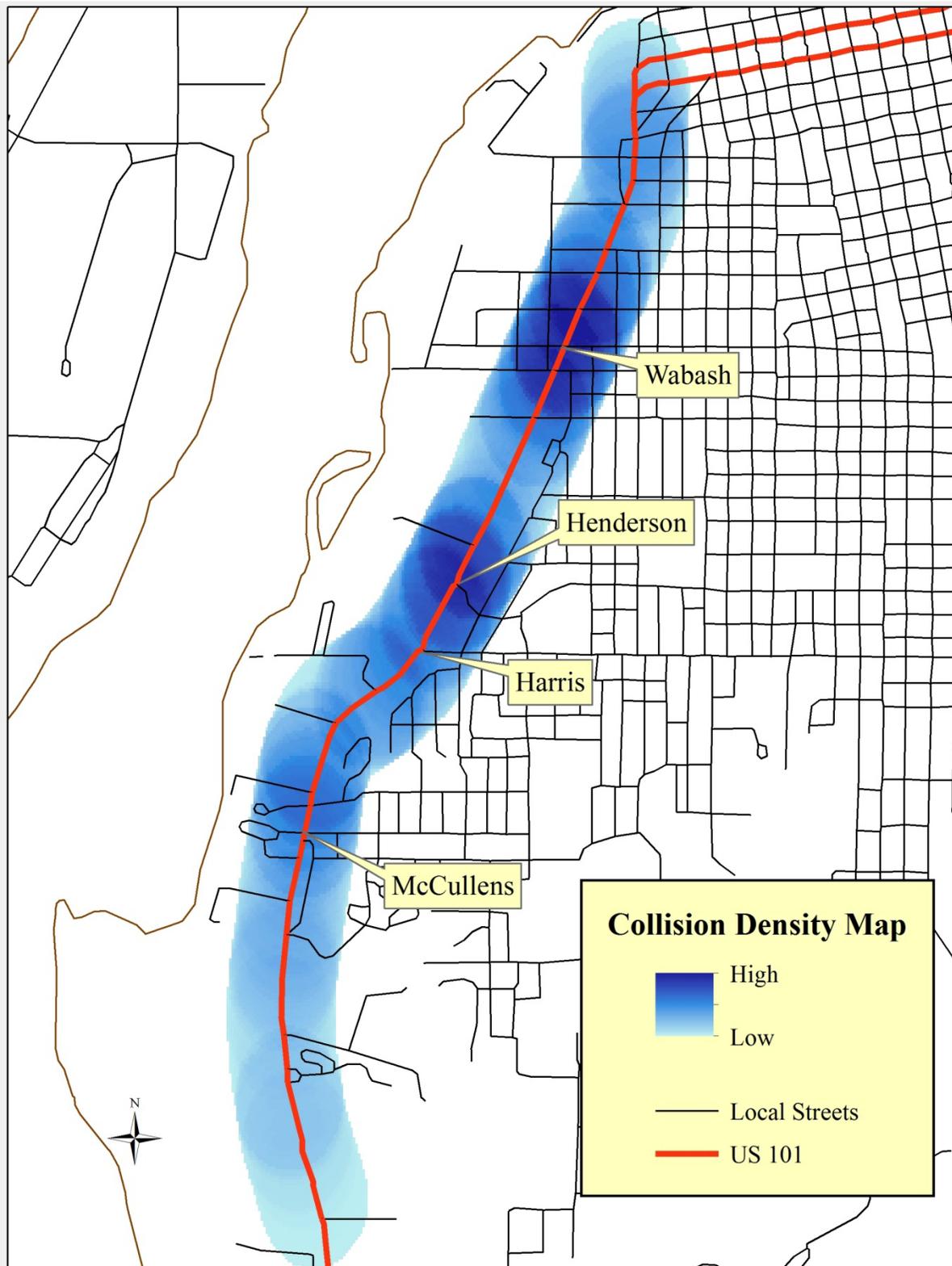
Figure 3: Types of Vehicle Collisions



### Collision Concentrations

The collision analysis completed by District 1 Traffic Safety provided the location of vehicle collisions over a 10 year period. Calculating the density of collisions provides an illustration showing the locations of higher density (Figure 4). The key locations identified include the Wabash Avenue and Henderson Street intersections. The collision density at those locations has been attributed to congestion during peak times. As vehicles queue at intersections it creates a difficult environment for drivers as vehicles turn across traffic using the two-way left-turn lane and ingress and egress movements from driveways. The queuing of vehicles can also backup to intersections downstream and upstream causing additional collisions.

Figure 4: Collision Density Map



## Pedestrians/Bicycles

The Pedestrian and Bicycle Road Safety Audit recommends installing additional opportunities for pedestrians to cross Broadway in the following locations: northside of Harris Street, Hawthorne Street, and Clark Street. These locations were identified as opportunities to provide additional crossings to reduce the number of midblock crossings occurring by pedestrians and bicycles. The density of driveways increases the number of conflict points between pedestrians and bicycles. The long distances between marked crosswalk opportunities discourages safe crossing at signalized intersections.

## TRAFFIC OPERATIONS

The AADT on Broadway in 2011 was greater than 33,000 vehicles per day. The Henderson Street and Wabash Avenue intersections are some of the busiest intersections in District 1. Driveway density currently averages 42 driveways per mile of roadway. Evidence suggests that corridors with driveway density greater than 40 driveways per mile are impacted by a reduction in free flow vehicle speed by 10 miles per hour (NCHRP 420, 1999). The Wabash Avenue intersection is a five leg intersection and the Fairfield Street leg requires an additional phase to allow northbound traffic to turn onto Broadway or Wabash Avenue. Northbound Fairfield Street limits the ability of the traffic signals in the Broadway corridor to be coordinated for optimal operation.

## TRAFFIC MODELING

### Humboldt County Travel Demand Model

A travel demand model is a computer program with a defined spatial (geographic) area that simulates traffic levels and patterns. Caltrans coordinates with Humboldt County, HCOAG and the City of Eureka to develop and maintain the Humboldt County Travel Demand Model (HCTDM), a planning and decision making tool used to assess the impacts of changes in land use on the roadway system. The model utilizes information regarding land use and the street network to simulate vehicle trips. The travel demand model is not suitable for comparing and evaluating individual transportation improvements due to lack of detail in the model's road network. The travel demand model requires less resources than a microsimulation model for calibration and is not used to predict traffic at individual intersections. The HCTDM does produce vehicle origin and destination information that is used within the microsimulation model.

### Greater Eureka Area Microsimulation Model

The Greater Eureka Area Travel Model (GEATM) relies on the HCTDM to produce initial estimates of the traffic demand for peak periods, which are used in conjunction with traffic counts and other data to calibrate the model. GEATM is capable of analyzing detailed traffic impacts due to population growth, changes in land use, roadway improvements, and other scenarios. The added value of using traffic modeling is the ability to compare different transportation improvement scenarios' impact on traffic throughout the Eureka area. The microsimulation model includes nearly every street in the Eureka area including individual intersections. The computer model is built on a geographic information system using Transmodeler software. Appendix B provides additional technical details regarding modeling. The microsimulation software includes a visualization tool (Figure 5) to allow non-technical users to see how

the model functions. The microsimulation model simulates driver behavior when people change their driving route based on traffic conditions in an attempt to save time. The model uses public transportation routes and school bus route information to better reflect existing/future traffic conditions. Intersections that are heavily influenced by pedestrian activity are incorporated into the model based on existing pedestrian volumes. Bicyclist behavior is built into the model based on additional timing at intersections. For more information see Appendix B.

Figure 5: 3D View of Fourth Street and F Street



## ECONOMIC CONSIDERATIONS

The business community is concerned about the economic impacts of installing a raised median along the Broadway corridor. Research studies suggest that property values could increase after the installation of a raised median. The **Raised Median Economic Impact Study** (2013) prepared by the Utah Department of Transportation Research Division showed that businesses received an increase in corridor-area retail sales and sales per square foot due to a raised median.

Another study, **Business Perceptions of Access Management Techniques** (2013) explains the primary challenges with existing research is measuring economic impacts of businesses based exclusively on the perceptions of business owners and customers. Another shortcoming of prior studies is the focus on business reported sales, which is typically estimated or impossible to accurately determine, such as in the case of franchise data not being broken down by individual location. Survey data from a North Carolina study shows a significant and positive increase in perception by businesses after installation of a raised median. The safety benefits of a raised median translates into a better perception by customers. Future projects involving construction have the potential to impact businesses; however, The impact of construction to businesses may be reduced by providing adequate access to businesses during construction, reducing construction time, and constructing a raised median in phases (Eisele et al., 1999).

## V. Existing Projects

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### BROADWAY ADA (EA 01-0B620)

This improvement project is located on Broadway from PM 75.3 to 77.6. The scope of work for the build alternative includes replacing/installing curb ramps, sidewalks, driveways, splitter islands and installing audible pedestrian systems at all existing signalized intersections within the project limits. The project includes new drainage inlets to address drainage along segments of sidewalk. The sidewalk width throughout the entire project will be 5' and not the standard 6' due to significant cost of construction and right-of-way impacts to adjacent properties. The estimated cost for this project is \$3,970,000 (cost estimate completed in 2012). The project awaits funding.

### HAWTHORNE-WABASH SAFETY PROJECT (EA 01-0C710)

This project proposes to improve intersections and adjacent segments along US-101 (Broadway) at Hawthorne Street, Wabash Avenue/Fairfield Street, and 14<sup>th</sup> Street by reconfiguring the intersections, adjusting signal timing, and constructing a raised median. There are two alternatives included in the project. Alternative 1 proposes to install a traffic signal at Hawthorne Street, construct raised median, curbs, ramps, and crosswalks. Alternative 2 proposes to construct restricted left turns at the intersection of Broadway and Hawthorne Street, construct raised median, curbs, and ramps. The overall project incorporates pedestrian and ADA improvements. Both alternatives will eliminate the northbound leg of Fairfield Street. The tentative year for start of construction is 2018.

### ADAPTIVE TRAFFIC SIGNAL CONTROL PROJECT

This project proposes to research and consider the possible installation of an Adaptive Traffic Signal Control system along Broadway. This promising new technology may give Caltrans the ability to coordinate traffic signals in real time using sensors in the ground or cameras mounted on traffic poles that detect vehicles as they approach intersections. Changes in signal timing will better reflect actual conditions of the road network and have the ability to respond to specific events, such as traffic collisions or community events. Using real time signal control can improve the flow of traffic and reduce congestion at some locations.

## VI. Community Involvement

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### TECHNICAL ADVISORY GROUP

A Technical Advisory Group (TAG) was formed to gather more detailed input from stakeholders to develop concepts for traffic modeling of transportation scenarios. The TAG was composed of local government agencies and local community organizations:

County of Humboldt	Keep Eureka Beautiful	Humboldt Bay Bicycle Commuters Association
City of Eureka	Greater Eureka Chamber of Commerce	Concerned Citizens for Responsible Development
Humboldt County Association of Governments	Green Wheels	Members of General Public
Redwood Community Action Agency	Humboldt County Public Health	Disabled Community Member

### Comment Summary

The group provided comments regarding the type of parameters that would be included in the microsimulation modeling. There were questions about the collision analysis performed for the EFS and how it would be incorporated into the analysis. The TAG asked how pedestrians and bicyclists would be included in the model. Caltrans Staff used comments to supplement the existing modeling process with additional technical analysis.

### PUBLIC MEETINGS 2012

The outreach method for the first round of public meetings included two formal presentations and an open house. The project engineer, Jeffrey Pimentel, presented the EFS improvement scenarios followed by a public question and answer session. After and between the two presentations, the community was invited to review displays, discuss issues, and ask questions of the project team. A series of large storyboard displays provided a history of the EFS, including a graphic representation of the transportation improvement scenarios (see section VII Broadway Scenarios). Caltrans' staff provided computer displays of the microsimulation modeling used to generate the scenarios. Comments received during the meeting were used to develop a final set of six scenarios for the final public meeting in February 2014.

The purpose of the meetings:

- Provide an overview and background of the EFS
- Present the initial findings developed and tested by staff using microsimulation modeling
- Solicit input on the first round of improvement scenarios

Business Stakeholder Meeting- February 8, 2012

On Tuesday, February 8, 2012, Caltrans District 1 held a business stakeholder meeting. This meeting was focused on getting the business/owner responses to the initial set of scenarios. Initial door-to-door Business Stakeholder contact was conducted in mid-January 2012 to refresh the Business Stakeholders with the purpose of the study and to invite them to attend the February 8<sup>th</sup> meeting. A complete list of attendees is attached in Appendix C.

Participants included representatives from:

County of Humboldt	Northern California Gloves & Safety	Bayview Motel
City of Eureka	Broadway Animal Hospital	Renner Petroleum
Campton Electric	Security National Master Holding Company	SNP
Security National	Redwood Region Audubon Society	Leon's Car Care
Marina Center		
Dan's Auto Electric		

**Business Comment Summary.** There was concern by some of the businesses along Broadway regarding access to their property as it related to the potential construction of raised medians. There were concerns about the effects of raised medians on traffic off Broadway, and they were interested in the status of a possible connection of Waterfront Drive to alleviate congestion. Several people mentioned a planned Brewery on Sunset Street that needed to be considered. There is interest in maintaining or improving travel time, congestion and speed limits. Some community members would like to be able to travel faster along the corridor and others would like to see vehicle speeds reduced to provide a safer environment for non-motorized users. There was concern the variation of speed limits (45-40-30 MPH) will limit the possibility of signal synchronization. The community also indentified the possibility of connecting business access along Broadway to reduce vehicles turning across Broadway.

First Open House with Public- February 16, 2012

On Thursday, February 16, 2012, Caltrans District 1 held a Public Stakeholder Meeting for the EFS. This was the first Public Stakeholder meeting held since the inception of the EFS. A complete list of attendees is attached as Appendix C.

Participants included representatives from:

Assemblyman Chesbro's Office	Humboldt County Association of Governments	The Party Place
County of Humboldt	Redwood Community Action Agency	Eureka Transportation Safety
City of Arcata		Broadway Medical
City of Eureka		

BF Cars Bay Tank & Boiler  
Works  
Times Standard  
Lost Coast Brewery  
Hilfiker Co.

LACO Associates  
Humboldt Bay Bicycle  
Commuters Association  
Eureka Natural Foods

Humboldt Area Foundation  
Reflections Jewelry  
Eureka Host Lions  
AT&T

**Community Comments.** The community expressed support for access for disabled individuals, traffic calming, bicycle and pedestrian safety; including bicycle lanes, narrow traffic lanes, continuous sidewalks, and incorporating ideas from the Pedestrian and Bicycle Road Safety Audit. Some community members suggested a raised median could include landscaping to beautify Broadway. There was also concern regarding accessibility for businesses being affected by raised medians.

## FINAL PUBLIC MEETING AND COMMENTS

### Second Open House with Public- February 27, 2014

On Thursday, February 27, 2014, Caltrans District 1 held a public meeting for the EFS. The meeting was attended by over 100 members of the community. The presentation covered the history of the project and outlined the final six scenarios under consideration. The presentation was followed by a question and answer session with the public. After the presentation, the community was invited to review displays, discuss issues, and ask questions of the project team. A series of large storyboard displays provided a history of the EFS, including a graphic representation of the proposed transportation improvement scenarios (Appendix E). Caltrans' staff provided computer displays of the microsimulation modeling used to generate the scenarios. The community provided comments using comment cards and had the ability to mail or email comments by March 15, 2014. Comments received during the meeting are summarized below and are also included in Appendix A.

**Community Comments.** There were many supporting comments for a traffic signal at the Hawthorne Street intersection. A traffic signal at Clark Street is supported by some members of the community, but others are concerned about the potential safety benefits for pedestrians due to sight distance issues and the additional wait time caused by a traffic signal. The community is concerned about excessive speeding and inattentive drivers. Some people called for a balance between the interests of businesses and safer access for pedestrians/bicyclists. There were many businesses along Broadway that expressed concerns about customer access to their property and truck access being limited by a raised median. There were issues identified with drainage along the sidewalks, curb ramps perpendicular to the direction of travel, and accessibility for pedestrians.

**Organization Comments.** The Keep Eureka Beautiful organization expressed support for a raised median and sidewalks that include landscaping such as trees and shrubs. They also expressed support for a more distinct gateway into Eureka. The Humboldt Bay Bicycle Commuters Association (HBBCA) voiced support for protected crosswalks, bicycle lanes, and adding a dedicated right turn lane on Henderson Street. The HBBCA recommends adding a bicycle turn lane on Henderson Street for southbound bicycle movements.

**City of Eureka.** The City of Eureka expressed concern over the potentially adverse effect of raised medians for access by police, fire, and public works. They have concerns regarding traffic being diverted to local streets and losing access to businesses in the corridor. The City feels the closure of northbound Fairfield Street should be balanced with a traffic signal at Hawthorne Street. The City believes the study should look further at the Henderson/Harris intersections and take into consideration the future plans for a more appealing entrance into the south side of the City (Appendix A).

**Humboldt Bay Fire.** The current system of fire hydrants in certain locations is only provided on one side of Broadway, and during a fire both directions of traffic are shutdown. Humboldt Bay Fire requested fire hydrants be evaluated during the review of future local development and transportation projects. Several of the impacts of installing a raised median can be mitigated through a drivable median with mountable curbs.

**Humboldt County Association of Governments.** HCAOG expressed their preference for continuous bike lanes with a minimum 5 foot shoulder on Broadway or no bike lanes to avoid suddenly terminating bike lanes. They support a traffic signal at Hawthorne Street in conjunction with the closure of Fairfield Street. HCAOG does not support a traffic signal at Clark Street, and they recommend installation of emergency vehicle preemption coincident with installation of raised medians. There is concern about whether U-turns would be allowed and they suggest allowing U-turns to avoid vehicles using local streets to turn around.

#### Traffic Safety Summit 2014: 101 Through Eureka- March 20, 2014

The Senior Action Coalition held a public meeting to share traffic safety concerns in downtown Eureka. Some suggestions from the summit that relate to this EFS include: timed traffic signals to create better breaks in traffic, signal pre-emption for emergency vehicles, more speed limit signs, signage for waterfront bicycle path, longer period for all red lights, fenced median between Humboldt Waste Management and the bowling alley, and a traffic calming gateway entrance to Eureka.

## VII. Broadway Scenarios

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### PRELIMINARY FEASIBILITY SCENARIOS

The scenarios were originally conceived to include a base case and three build scenarios. These scenarios were shared in 2012 during the initial public meetings with the public and businesses. There is more information about the meetings provided in section VI Community Involvement.

### Broadway Base Case Scenario

- Existing conditions with all driveways included

### Low Impact Scenario

- Signal at Hawthorne Street
- Northbound leg of Fairfield Street closed

### Medium Impact Scenario

- Signal at Hawthorne Street
- Northbound leg of Fairfield Street closed
- Narrow median (2.5') with no turn pockets (from Cedar Street to 4<sup>th</sup>/5<sup>th</sup> Couplet)
- Signal at Clark Street (no dedicated left turn lanes provided)
- Restricted left turns from Broadway at Clark Street, Washington Street & 6<sup>th</sup> Street (time-of-day dependent)

### High Impact Scenario

- Wide Median (12') with turn pockets and openings only at signalized intersections (from Kmart to Cedar Street)
- Signal at Hawthorne Street
- Northbound leg of Fairfield Street closed
- Narrow median (2.5') with no turn pockets (from Cedar Street to 4<sup>th</sup>/5<sup>th</sup> Couplet)
- Signal at Clark Street (no dedicated left turn lanes provided)
- Restricted left turns from Broadway at Clark Street, Washington Street & 6<sup>th</sup> Street (time-of-day dependent)

### Performance Measures

**Accessibility for the Disabled.** Appropriate infrastructure design to limit obstructions, provide signage, appropriate sidewalk width, reachable push buttons, and appropriate elevation changes at curb ramps and driveways.

**Pedestrian Safety/Mobility.** Safe and accessible travel on foot. Visibility and predictability of pedestrians is important to their safety.

**Bike Safety/Mobility.** Safe and accessible travel on bicycle. Bicycles are considered both a vehicle and a pedestrian depending on their location. Visibility and predictability of bicycles is important to their safety.

**Vehicle Safety/Operations.** Provide a reliable travel time and safe driving environment.

**Emission Reductions.** The overall reduction of per capita greenhouse gas emissions due to reductions in congestion by changing a vehicle trip to active transportation, such as bicycling or walking.

## Transition to Final Feasibility Scenarios

The preliminary feasibility scenarios were modified based on the feedback from the public and stakeholders. The low impact scenario proposed closing northbound Fairfield Street, which is included in all final scenarios. The Low Impact scenario also proposed a traffic signal at Hawthorne Street and was carried forward into Scenarios 1.0, 3.0, and 4.0. The medium impact scenario proposed a narrow median with no turn pockets from Cedar Street to the 4<sup>th</sup> and 5<sup>th</sup> Street Couplet that is now included in Scenarios 1.0 and 2.0. The High Impact scenario proposed to build a raised median with openings at signalized intersections from Kmart to Cedar Street. The raised median (12' wide) concept in the High Impact Scenario is incorporated into all final scenarios. Scenario 1.0 and 2.0 provide a raised median from McCullens Avenue to Cedar Street then narrowing the raised median to 2.5' wide up to the 4<sup>th</sup> and 5<sup>th</sup> Street Couplet with openings at signalized intersections. The raised median between Kmart and McCullens Avenue was removed from consideration in the final scenarios due to property access constraints and lower collision density compared to the rest of the corridor.

## Alternative Ideas for Future Consideration

**Introduction.** The following improvements were not originally included in the scope but determined to be important considerations to address issues suggested by the community.

**Landscaping and Beautification.** There were many comments by the community regarding improvements to the aesthetics of Broadway. Street landscaping makes communities more attractive and can contribute to a more livable and environmentally sustainable public space. Well-designed landscaping along the roadway or in medians can increase driver awareness of the immediate environment as a shared space, which improves the experience for bicycles, pedestrians, and drivers. Sidewalk and median landscaping can provide a more inviting atmosphere and hide unattractive elements such as utilities. There are numerous studies that report increased property values due to street trees, and have also been shown to reduce collisions. There may be limited opportunities to add landscaping to the sidewalk due width constraints, but with support from business owners landscaping could be an option in certain locations. The challenge with using landscaping is the cost and maintenance. Future projects should consider landscaping along Broadway taking into account the potential issues with sight distance and maintenance.

**Adaptive/Smart Lighting.** There are concerns by the community about drivers not being able to see pedestrians at night. Street lighting can be networked and managed using wireless communications, which is often called "smart street lighting." Smart street lighting systems have variable light settings so that street lights are dim until sensors detect people and cars, and then smart lighting will fully illuminate an area letting drivers know pedestrians/bicycles are in the area. Lighting levels can also be remotely adjusted to compensate for local conditions such as inclement weather.

**Leading Pedestrian Interval (LPI).** The concept suggested by some members of the community is increasing the length of time traffic lights are red. Leading pedestrian interval is a safety technique used to provide pedestrians more time to cross the street and be more visible for vehicles turning across traffic. The "walk" signal appears 3 or more seconds before the green light giving more priority to pedestrians and could potentially reduce collisions. The downside to LPI is additional

length of time incorporated into a phase when pedestrians are present, which can contribute to traffic congestion.

## FINAL BROADWAY FEASIBILITY SCENARIOS

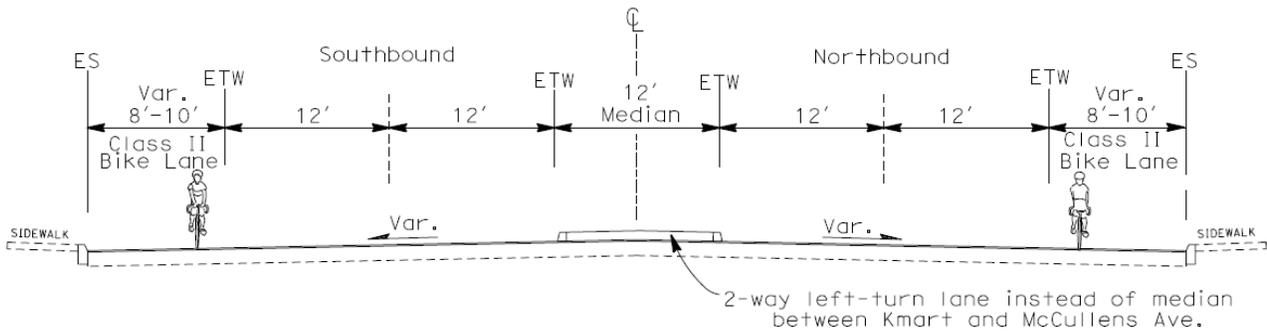
### Corridor Improvements Included In All Scenarios

**Introduction.** The following improvements were included in all scenarios because they are important considerations for all future projects. All Scenarios will eliminate parking along Broadway between Kmart and Wabash Avenue to provide bike lanes, reduce traffic conflicts, and increase visibility for vehicles turning out of businesses. The northbound leg of Fairfield Street will be closed to traffic at the Wabash Avenue intersection and a protected left turn phase will be provided for vehicles turning onto Broadway from 14<sup>th</sup> Street and from Wabash Avenue.

**Access Management.** Reducing the number and width of driveways was shown through modeling to have a positive effect on the speed and flow of traffic. Consolidation of access points also has a positive effect on the safety of drivers, cyclists, and pedestrians. A reduced number of driveways contributes to the ability of drivers to anticipate turning vehicles. Consolidation of driveways will need to be considered on an individual basis through consultation of business/property owners as part of future projects in the corridor.

**Bicycle Lanes.** The most feasible treatment for bicycle safety are conventional bike lanes (Figure 6), buffered bike lanes, and one-way protected cycle tracks. Class II bike lanes are the most feasible type of bike lanes that meet the need for this EFS. Class III bike lanes would be not as well received by the community and have negative impacts on the flow of vehicle traffic. Cycle tracks are distinguished from traditional bicycle lanes because they use a variety of methods for physical protection or separation from vehicles. Cycle tracks may be considered in the future after Caltrans analyzes and incorporates alternative designs, into Caltrans standards, outlined by the National Association of City Transportation Officials (NACTO) "Urban Bikeway Design Guide". The challenge with using a physical barrier for separation is the maintenance associated with street sweeping and providing access for bus stops. Conventional bike lanes use white line stripping and white stencil "bike lane" to visually separate vehicle traffic from bikes. Buffered bike lanes are conventional bike lanes with additional buffer space provided by 2-3 feet of diagonal cross hatching. The other options that are less feasible are raised cycle tracks, and two-way cycle tracks due to the right-of-way constraints and Caltrans standards (NACTO, 2014).

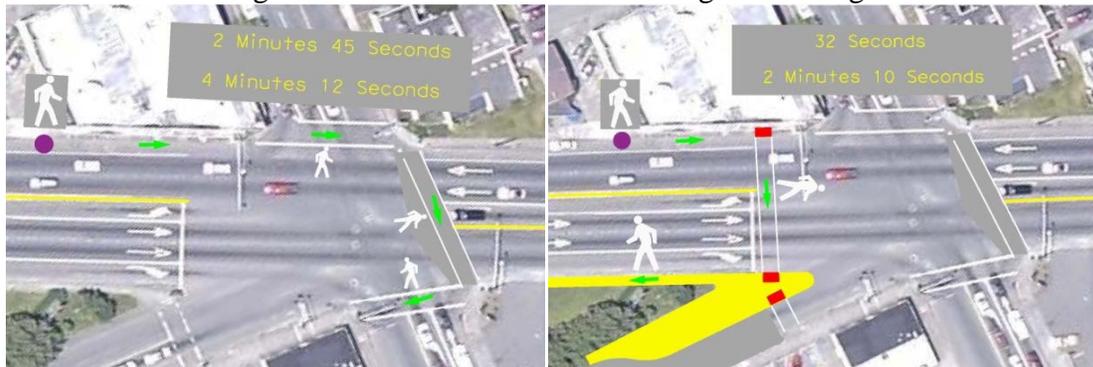
Figure 6: South Broadway Cross Section (All Scenarios)



### ROUTE 101 (Kmart to Wabash Ave.)

**Pedestrian Crossing.** Adding a marked crosswalk on the south side of the Wabash Avenue intersection would shorten the time it takes a pedestrian to get from the west side over to the east side by as much as 87% (Figure 7). When a pedestrian crosses under existing conditions it can take between 2:45 minutes to 4:12 minutes. After adding the marked crosswalk on the south side of Wabash the time to cross is reduced to a range between 2:10 minutes and 32 seconds. The range depends on when the pedestrian activates the push-button during the cycle length. In addition to a marked crosswalk, closing the northbound leg of Fairfield Street will shorten the crossing distance/time of the Wabash Avenue intersection. Providing a crossing will likely encourage pedestrians to use the traffic signal versus crossing at midblock locations.

Figure 7: Wabash Pedestrian Crossing Time Range



**Signal Coordination/Phase Optimization.** Adaptive Traffic Signal Control technology is a traffic management strategy in which signal timing changes or adapts based on actual traffic demand. Existing signal systems use pre-programmed signal timing schedules. Coordinated Signals adjust the timing of traffic lights to accommodate changing traffic patterns and eases traffic congestion along a corridor. The travel times become more reliable by progressively moving vehicles through a corridor, and giving the driver a better driving experience through smoother traffic flow.

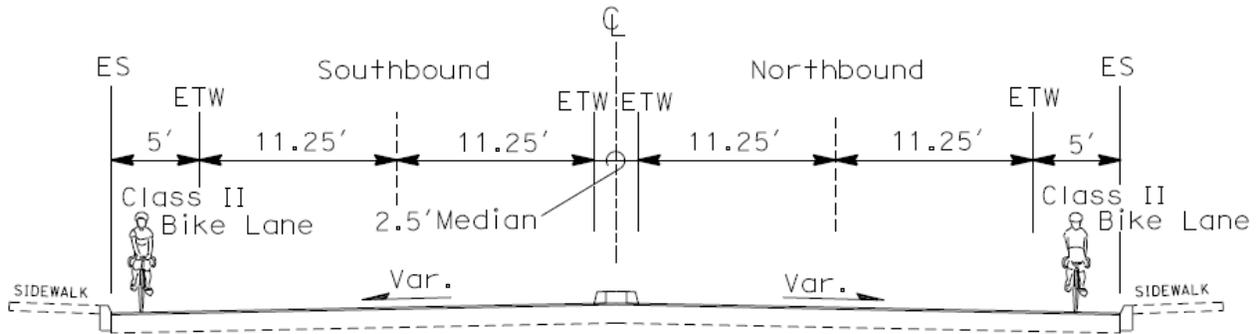
### Scenario 1.0

This scenario proposes to install raised median along Broadway between McCullens Avenue and Cedar Street. The northern section (Cedar Street to 5<sup>th</sup> St) will narrow the median from 12 feet to 2.5 feet wide (Figure 8a) in order to provide standard 5 foot bike lanes. Hawthorne Street and Clark Street are proposed to become signalized intersections. A protected left turn phase will be added at 14th Street and Wabash Avenue. See Appendix E for a map of proposed improvements and review Figure 9 for comparison of scenarios.

### Scenario 2.0

This scenario proposes to install raised median along Broadway between McCullens Avenue and Cedar Street (Figure 6). The northern section (Cedar Street to 5<sup>th</sup> Street) will narrow the median from 12 feet to 2.5 feet wide (Figure 8a) in order to provide standard 5 foot bike lanes. Vehicles traveling from Hawthorne Street will be restricted from turning left onto Broadway.

Figure 8a: North Broadway Cross Section (Scenario 1 & 2)



## ROUTE 101 (Cedar St. to 5 th St.)

### Scenario 3.0

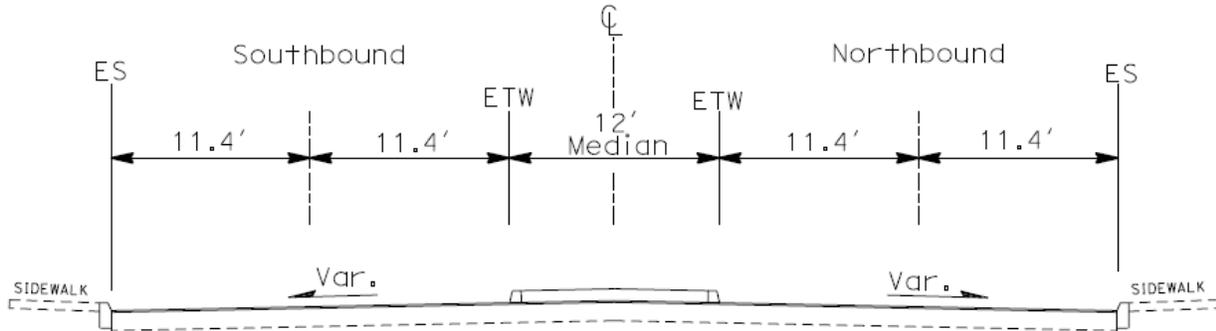
This scenario proposes to install a raised median (Figure 6 & 8b) with selected midblock openings and openings at signalized intersections along Broadway. A traffic signal is proposed at the Hawthorne Street intersection.

### Scenario 4.0

This scenario proposes to install a raised median (Figure 6 & 8b) with selected midblock openings and openings at signalized intersections along Broadway. A traffic signal is proposed at the Hawthorne Street intersection. A dedicated right turn lane would be added to Henderson Street,

increasing the number of westbound lanes from two to three: dedicated left, left or straight, and a new dedicated right.

Figure 8b: North Broadway Cross Section (Scenario 3 - 6)



## ROUTE 101 (Cedar St. to 5 th St.)

### Scenario 5.0

This scenario proposes to install a raised median (Figure 6 & 8b) with selected midblock openings and openings at signalized intersections along Broadway from McCullens to 4<sup>th</sup> and 5<sup>th</sup> Streets. Left turn movements from Hawthorne Street onto Broadway will be restricted at this location.

### Scenario 6.0

This scenario proposes to provide a raised median (Figure 6 & 8b) with selected midblock openings between intersections and openings at all signalized intersections along Broadway. Left turn movements will be restricted at the intersection with Hawthorne Street. A dedicated right turn lane would be added to Henderson Street, increasing the number of westbound lanes from two to three: dedicated left, left or straight, and a dedicated right.

Figure 9: Scenario Comparison

Corridor Improvements						
	Scenario					
	1.0	2.0	3.0	4.0	5.0	6.0
Raised median (openings at signalized intersections)	✓	✓				
Raised median (openings at signalized intersections & midblock)			✓	✓	✓	✓
Hawthorne St. traffic signal	✓		✓	✓		
Hawthorne St. turn restrictions		✓			✓	✓
Clark St. traffic signal	✓					
Henderson St. Additional right turn lane				✓		✓
Bike lanes (Cedar St. to 4 <sup>th</sup> /5 <sup>th</sup> St.)	✓	✓				
Note: All Scenarios will eliminate parking on Broadway between Kmart and Wabash Avenue. The northbound leg of Fairfield street will be closed at the Wabash intersection. Protected left turn signal phases will be added for vehicles turning onto Broadway at 14th street and Wabash Avenue.						

## VIII. Results

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### TRAFFIC SAFETY

The traffic safety analysis shows evidence that replacing the two-way left turn lane with a raised median has the potential to significantly reduce the total number of broadside collisions and the collision severity within the corridor. In addition, forcing drivers to make left turns at signalized intersections and at exclusive left turn pockets will reduce the number of vehicle collisions within the corridor. Using research from the National Crash Modification Factors Clearinghouse (CMF, 2014), there are collision modification factors (CMF) that estimate the reduction in collisions after implementation of different countermeasures. Replacing a two-way left-turn lane with a raised median is a proven countermeasure. Statistics show that by replacing two-way left-turn lane with raised median will reduce serious and minor injury collisions by 21% and property damage collisions by 33%. The Traffic Safety unit identified inattention to the complex movements as the overriding theme of collisions in the area of McCullens Avenue to South Bayshore Way. Another countermeasure proven to reduce collisions is the reduction of driveways. The EFS did not review individual driveway locations or property access, so the reduction of driveways is a recommendation for future study.

### Traffic Signal Coordination

Traffic signal coordination can promote improved safety and mobility. Coordinated traffic signal systems can produce platoons (groupings) of vehicles that can proceed through multiple intersections un-impeded while providing gaps for cross movements and vehicles attempting to enter the corridor. A reduction of stopped vehicles can promote consistent speed that can potentially reduce the number of rear-end type collisions.

### Traffic Signals

Traffic signals are considered at Hawthorne Street and evaluated at Clark Street based on a recommendation from the Road Safety Audit to facilitate safe pedestrian crossing of Broadway and have the potential to reduce vehicle collisions. Installing new traffic signals at these locations requires a traffic signal warrant analysis. At the time of this EFS traffic signal warrants were not met for the proposed traffic signal locations. Caltrans typically operates under the 2012 California Manual on Uniform Traffic Control Devices Section 4.C.01 when evaluating locations for new traffic signals. The high vehicle volumes during peak times and the collision history contribute to the study of a traffic signal at these intersections.

### Protected Left Turn Movements

Several intersection improvements have been developed to reduce the risks inherent in cross movement situations such as left turns, including converting from a green light (permissive left-turn mode) to permissive/protected (green arrow) phasing. In a "permissive" mode, a green signal permits vehicles to turn left in the absence of oncoming traffic. In a "permissive/protected" mode, the permissive left-turn phase is immediately followed by an exclusive, protected left-turn phase, initiated by a green arrow signal indication. A protected left turn for vehicles reduces the incidence of vehicle collisions with other vehicles, bicycles and pedestrians. The protected left provides a distinct phase for pedestrians crossing the street during the phase when vehicles are traveling straight or turning right.

## TRAFFIC OPERATIONS

### Henderson Street Intersection

Adding an additional right turn lane at this location increases the capacity for approaching vehicles and separates right turning vehicles from left turning vehicles. Separating vehicles turning left and right will reduce the amount of time it takes for vehicles to proceed through the intersection. The additional lane will reduce travel time and vehicle emissions.

### Fairfield Street

There are operational benefits to closing the northbound leg of Fairfield Street at the Wabash/Broadway Intersection. Closing the northbound leg will allow better coordination of traffic signals in the corridor and reduce vehicle queuing along the Broadway corridor. It should be noted

the City of Eureka considers this closure linked to a signal installation at Hawthorne Street. Closing the northbound leg of Fairfield at Wabash Ave will enhance pedestrian access by reducing the crossing distance for pedestrians.

#### Protective/Permissive Left Turn Phase at Wabash Avenue/14<sup>th</sup> Streets

Adding a protected left turn phase followed by a permissive left turn phase may be a more efficient way to provide better service for eastbound and westbound left turning vehicles. Adding a protective/permissive left turn phase is only recommended if changes are implemented at Fairfield Street. Further study of this feature is recommended.

#### Modeling 2010

The Greater Eureka Area Microsimulation model was used to simulate the following: Base 2010, Base 2020, and Scenarios 1-6. There were also additional scenarios modeled to determine the impacts of specific improvements versus a combination of improvements. Base 2010 represents current traffic conditions and suggests that minor transportation improvements can have a significant range of effects on the traffic volumes on Broadway and local streets in the Eureka area. The modeling results suggest that individual intersections can have a wide variation of traffic delay. This may be caused by a lack of additional capacity on Broadway to support increased traffic under future conditions. The model predicts the average speed of vehicles traveling along Broadway decreased by 9% due to projected increases in traffic caused by population growth (Figure 10). Vehicles traveling the corridor will require an additional 54 seconds, roughly a 12% increase in time.

Figure 10: Modeling 2010 Versus 2020

	Travel Time (min)	Average Speed (mph)
Base 2010	7:49	22.3
Base 2020	8:45	20.4
% Change	12%	9%
Difference	54 Seconds	2 mph

## FINAL BROADWAY FEASIBILITY SCENARIO RESULTS

### Introduction

The following six scenarios are provided for comparison and analysis. The actual project improvements contained in future projects will combine or select features from each of the scenarios. The scenarios include variations of the same improvements to provide greater understanding of how each improvement interacts with other improvements and their combined impact on traffic in the Eureka area.

### Scenario 1.0

This scenario reduces travel time on Broadway from 8:45 minutes to 8:28 minutes. The installation of raised median reduces the number of left turn conflicts by 100 (Figure 12). There are 12 new protected left turn phases (green arrow) to help reduce collisions. This scenario provides 2.5 miles of designated bike lanes on each side of the street, and increases the number of marked crosswalk locations by 9. Traffic signals at Hawthorne and Clark Streets provide opportunity for vehicles, bicycles, and pedestrians to safely cross Broadway. Adding a traffic signal at Clark Street would decrease the distance between crossing opportunities from 1540 feet to 950 feet. The estimated cost to construct these improvements is \$4,150,000 (Figure 13).

### Scenario 2.0

This scenario provides safety and operational improvements. There is an increase in the average vehicle speed by almost 2 mph and reduction of the travel time from 8:45 to 7:54 minutes. The installation of raised median reduces the number of left turn conflicts by 100 (Figure 12). There are 12 protected left turn phases (green arrow) to help to reduce collisions. This scenario provides 2.5 miles of designated bike lanes on each side of the street, and increases the number of marked crosswalk locations by 1. This scenario improves mainline traffic flow by not adding traffic signals. The estimated cost to construct these improvements is \$3,175,000 (Figure 13).

### Scenario 3.0

This scenario provides a mix of safety improvements in the corridor and minor improvements with regards to traffic flow. A minor reduction in travel time from 8:45 to 8:25 minutes is achieved. The installation of raised median with defined turn pockets reduces the number of left turn conflicts by approximately 90. There are 8 protected left turn phases (green arrow) to help reduce collisions. This scenario provides 2.0 miles of designated bike lanes on each side of the street, and increases the number of marked crosswalk locations by 5. A traffic signal at Hawthorne Street will provide an additional opportunity for vehicles, bicycles, and pedestrians to safely cross Broadway. The estimated cost to construct these improvements is \$3,786,000 (Figure 13).

Figure 11: Performance Measures

	Scenario						
	Base*	1.0	2.0	3.0	4.0	5.0	6.0
<b>Vehicle Operations</b>							
Travel time in minutes	8:46	8:28	7:54	8:25	8:49	8:18	7:50
<b>Vehicle Safety</b>							
Decreased number of left turn conflicts	~100	~100	~90	~90	~90	~90	~90
Increased number of protected left turn movements at signals	12	4	8	8	4	4	4
<b>Bicycle Safety/Mobility</b>							
Additional bike lane length in miles	2.5	2.5	2	2	2	2	2
<b>Pedestrian Safety/Mobility</b>							
Increased number of protected crosswalks	9	1	5	5	1	1	1
*Base Scenario calculated using computer modeling of future traffic conditions of the year 2020. All Scenario travel times are provided for comparison purposes.							

#### Scenario 4.0

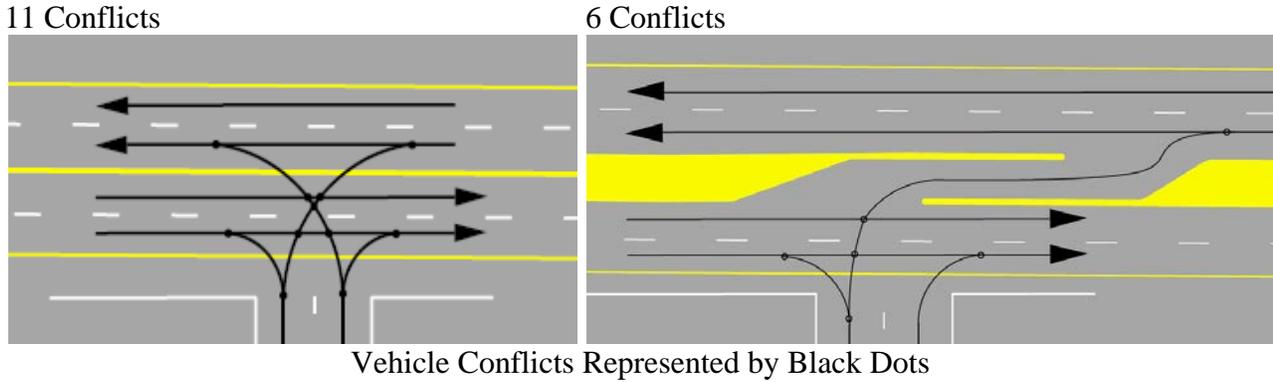
This scenario has no change in the travel time through the Broadway corridor. The interaction between the additional lane on Henderson Street and traffic signal at Hawthorne Street creates a unique situation in the traffic model that is not intuitive. The closure of the northbound leg of Fairfield Street combined with a traffic signal at Hawthorne Street results in the model showing additional vehicles using Henderson Street. The model run results suggest actual traffic flow patterns should be monitored as improvements are made in the corridor. The installation of raised median with defined turn pockets reduces the number of left turn conflicts by approximately 90. There are 8 protected left turn phases (green arrow) to help to reduce collisions. This scenario provides 2.0 miles of designated bike lanes on each side of the street, and increases the number of marked crosswalk locations by 5. A traffic signal at Hawthorne Street will provide opportunities for vehicles, bicycles, and pedestrians to cross Broadway. The estimated cost to construct these improvements is \$3,028,000 (Figure 13).

#### Scenario 5.0

This scenario reduces the travel time from 8:45 to 8:18 minutes through the Broadway corridor. The installation of raised median with defined turn pockets reduces the number of left turn conflicts by approximately 90 (Figure 12). There are 4 protected left turn phases (green arrow) to help to reduce collisions. This scenario provides 2.0 miles of designated bike lanes on each side of the street, and provides a marked crosswalk on the Southside of Wabash Avenue. Turn restrictions at Hawthorne

Street should contribute to a reduction in collisions at that location. The estimated cost to construct these improvements is \$3,207,000 (Figure 13).

Figure 12: Median Cross Movement Reduction



### Scenario 6.0

Scenario 6.0 reduces the travel time from 8:45 to 7:50 minutes through the Broadway corridor, which is the maximum time savings achieved by any scenario. The installation of raised median with defined turn pockets reduces the number of left turn conflicts by approximately 90 (Figure 12). There are 4 protected left turn phases (green arrow) to help to reduce collisions. This scenario provides 2.0 miles of designated bike lanes on each side of the street, and provides a crosswalk on the south side of Wabash Avenue. Turn restrictions at Hawthorne Street will reduce the number of conflict points. A dedicated right turn lane is proposed along Henderson Street to improve the flow of traffic. The closure of the northbound leg of Fairfield Street and an additional lane on Henderson provides significant time savings for drivers. The estimated cost to construct these improvements is \$3,750,000 (Figure 13).

Figure 13: Cost Estimate

	Cost	Scenario					
		1.0	2.0	3.0	4.0	5.0	6.0
Raised median (openings at signalized intersections)	\$1,424,879	✓	✓				
Raised median (openings at signalized intersections & midblock)	\$1,492,646			✓	✓	✓	✓
Hawthorne St. traffic signal	\$926,117	✓		✓	✓		
Hawthorne St. turn restrictions	\$580,042		✓			✓	✓
Clark St. traffic signal	\$282,000	✓					
Henderson St. Additional right turn	\$353,838				✓		✓
Bike lanes Cedar St. to 4 <sup>th</sup> /5 <sup>th</sup> St. (Includes cost of bike lanes in all scenarios of \$15,572)	\$60,410	✓	✓				
	<b>Subtotal</b>	<b>\$2,693,406</b>	<b>\$2,065,331</b>	<b>\$2,434,335</b>	<b>\$1,862,055</b>	<b>\$2,088,259</b>	<b>\$2,442,097</b>
Traffic Additions (9%)		\$242,407	\$185,880	\$219,090	\$167,585	\$187,943	\$219,789
Minor Items (5%)		\$12,120	\$9,294	\$10,955	\$8,379	\$9,397	\$10,989
Roadway Mobilization (10%)		\$294,793	\$226,051	\$266,438	\$203,802	\$228,560	\$267,288
Roadway Additions (20%)		\$538,681	\$413,066	\$486,867	\$372,411	\$417,652	\$488,419
Right-of-Way		\$367,759	\$274,759	\$367,759	\$413,759	\$274,759	\$320,759
	<b>Total</b>	<b>\$4,150,000</b>	<b>\$3,175,000</b>	<b>\$3,786,000</b>	<b>\$3,028,000</b>	<b>\$3,207,000</b>	<b>\$3,750,000</b>

## GREENHOUSE GAS EMISSIONS

Calculating greenhouse gas emissions is complex and requires information regarding the types of vehicles utilizing the roadway facility. Traffic delay and the distance vehicles travel to their destination cause increases in greenhouse gas emissions. All Scenarios reduce greenhouse gas emissions in comparison to Base 2020 scenario by conserving vehicle fuel. The closure of the northbound leg of Fairfield Street will reduce emissions due to the improvements in traffic flow along the Broadway corridor. Scenario 1.0, 3.0, and 4.0 will produce the most emissions due to the change in vehicle speeds associated with the installation of traffic signals. The impact of installing raised median is difficult to quantify due to the complex nature of vehicle movement. Scenarios 3.0 through 6.0 will produce slightly less emissions based on the number of vehicles using turn pockets versus traveling to signalized intersections. The additional 0.5 miles of bicycle lanes in Scenarios 1.0 and 2.0 will help reduce emissions depending on how much those improvements increase bicycle trips. Scenario 1.0 will have the highest level of emissions because of traffic signals at Hawthorne

and Clark Streets. Scenario 4.0 will produce less emissions in comparison to Scenario 3.0 due to the improvements in traffic flow caused by adding a right turn lane at Henderson Street. Adding an additional turn lane will reduce the amount of time it takes to clear traffic queued at the traffic signal. The reduced time at the Henderson Street intersection improves the flow of vehicles in the entire corridor. Scenario 6.0 reduces the most greenhouse gas emissions of all the scenarios evaluated followed by Scenario 5.0.

## IX. Recommendations

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The purpose of the EFS is to review the different options available to improve safety, operations, and accessibility in the Broadway corridor for vehicles, pedestrians, and bicycles. It is important to understand the scenarios are provided for comparison purposes only and there is not a recommended or preferred scenario as a result of this EFS. This information and study will serve as a guide for project teams moving forward as projects are initiated. It is noted that future projects along the corridor will require further traffic analysis and study by the appropriate departments within Caltrans.

### CORRIDOR IMPROVEMENTS

The EFS recommends any potential future projects involving a traffic signal at Hawthorne Street be looked at in conjunction with the closure of the northbound leg of Fairfield Street. All future projects in the corridor need to consider ADA improvements and strive to include those improvements as an interim solution to a single project to address those deficiencies (Project 01-0B620K). Drainage issues should be addressed by future projects in the locations identified in Appendix A. The results of the collision analysis suggest that raised median should be prioritized and applied in key locations with significant collision history. The design of future improvements should include aesthetic features when feasible.

### ACCESS MANAGEMENT PLAN

There is a need to develop an access management plan to provide a better balance between access to land development and safe/efficient operation of Broadway. Access management is the methodical approach to the location, design, spacing and operation of driveways, median openings, interchanges, and street connections (Access Management Manual, 2003). The increased density and width of existing driveways increases the conflict points with other vehicles, bicycles, and pedestrians. Providing drivers with more time to respond to the complex situations presented in the corridor will improve safety. The installation of raised median will require additional consideration of the different businesses along Broadway and their need for access. This plan is critical for determining the appropriate width and location of driveways before improvements to transportation infrastructure to meet ADA standards. There is also the opportunity to engage with businesses regarding street connections off Broadway to facilitate shared driveways between two or more adjacent properties. This plan would also help to establish possible opportunities for including landscaping in the median versus locations with a mountable curb or openings for emergency vehicles.

## PUBLIC/BUSINESS FOCUS MEETINGS

Focus meetings will fulfill the need to address individual business concerns about access to their businesses by trucks and customers. As individual projects are initiated there will be additional consideration on the impact of improvements on businesses. It is important to understand that safe access will improve the perception of customers visiting businesses.

## UPDATE MICROSIMULATION

The microsimulation model needs to be updated consistently as improvements are made to the corridor as well as the evolving traffic patterns of the road network. There needs to be additional consideration for pedestrian and bicycle circulation in the corridor. As projects are initiated there can be additional modeling of the proposed improvements to see how they impact the corridor as a whole. Further consideration of the operation of traffic flow on Henderson and Harris Streets should be done in conjunction with safety projects along the corridor. Continue coordination with HCAOG and the City of Eureka to keep the model calibrated to reflect current traffic conditions will be required.

## PEDESTRIAN CROSSINGS

Pedestrian crossings need to be studied in more detail. In locations where raised median is proposed, there will need to be consideration of pedestrian circulation. Additional consideration of installing a fence to encourage pedestrians to use marked crosswalks at traffic signals to cross the street. There needs to be additional research on providing High-Intensity Activated Cross Walk (HAWK) beacons that are coordinated with traffic signals. While HAWK systems can potentially be coordinated with adjacent coordinated traffic signals, such coordination would require that the pedestrian experience a controlled delay in order to give time for platooning vehicles on the through street to clear the segment (or maintain coordinated progression). Current HAWK systems are designed and deployed with very minimum delay (wait times) to the pedestrian once activated. Introducing more delay to the pedestrian would not meet the common pedestrian expectations of those familiar with other HAWK systems at other locations in the nation which do not include such pedestrian wait times. Another challenge to using pedestrian activated systems is the wait time required for vehicles to allow pedestrians to cross while contributing to congestion. It is important to have additional tools available when traffic signals or pedestrian activated beacons are not supported or warranted.

## X. Funding

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It is important to underscore this EFS is not a project and therefore is not tied to a funding source. This EFS can be used as a guide in the search for additional funding sources that could be used for future projects on the corridor, in lieu of or in addition to the mobility and safety funding sources available in the State Highway Operation and Protection Program (SHOPP). Below is a list of potential funding sources for projects that may be initiated in the future that include selected improvements featured in the EFS.

### ATP

Active Transportation Program is one potential source of funding for projects that increase the use of active modes of transportation, including proposed bicycling and walking improvements along Broadway. The ATP is a competitive program that takes federal and state funding sources and combines them into one program. The funding is divided between 40% to Metropolitan Planning Organizations, 10% to rural areas and urban populations less than 200,000 people, and 50% statewide through a highly competitive process. The funding is available to: local, regional, and state agencies; transit agencies; natural resource, public land agencies; public schools, school districts; tribal governments; and private nonprofit tax-exempt organizations.

### SHOPP

The State Highway Operation and Protection Program provides funding for capital improvements including maintenance, safety, and rehabilitation. Most operational and safety improvement projects are funded within the applicable programs in the SHOPP.

### STIP

State Transportation Improvement Program (STIP) is a five-year capital improvement program that provides funding for state and local projects that is a potential source of funding. STIP funding is split between the Regional Transportation Improvement Program (RTIP) at 75% and Interregional Transportation Improvement Program (ITIP) at 25% of funding. RTIP funds are allocated to HCOAG and depending on their priorities, they will identify improvements. Interregional Transportation Improvement Program is allocated to Caltrans and is another potential source of funding.

Appendix A  
Public Comments

US 101 Feasibility Study Business Stakeholder Meeting  
February 8, 2012 5:00 - 7:00 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: MIKE NEWMAN  
Address: PO BOX 6266  
City: EUREKA State: CA Zip: 95502  
Email: MNEWMAN@CI.EUREKA.CA.GOV

Representing Name of Organization or Agency: EKA CITY COUNCIL

Comments: BE AWARE OF SUNSET ST BUILD UP FOR  
LOST COAST BREWERY EXPANSION. I LIKE THE  
PROPOSALS FOR SIGNALS & STREET CHANGES/CLOSURES.  
JUST BE AWARE & READY TO INTEGRATE WITH  
THE MARINA CENTER PROJECT.

Please return by March 9th, 2012

IS THERE ANY WAY OF ~~HELPING~~ <sup>HELPING</sup> WITH THE CITY'S WATERFRONT DRIVE PROJECT?

US 101 Feasibility Study Business Stakeholder Meeting  
February 8, 2012 5:00 - 7:00 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: ANDY PRINCE  
Address: 2850 FAIRFIELD ST  
City: Eureka State: CA Zip: 95501

Representing Name of Organization or Agency: \_\_\_\_\_

Comments: look at Henderson between Fairfield &  
Broadway, Consider adding a new lane on  
the south side.

Please return by March 9th, 2012

US 101 Feasibility Study Business Stakeholder Meeting  
February 8, 2012 5:00 - 7:00 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: Chet Ogan  
Address: 811 O ST  
City: Eureka State: CA Zip: 95501

Representing Name of Organization or Agency: Self

Comments: Asa model, look at Octavia St in  
S.F. also, Traffic calming, restricted turns, off  
route access for residents

Please return by March 9th, 2012

I like the idea of limiting <sup>left</sup> turns at peak hours.  
Major concerns: decreasing air pollution, safety.

US 101 Feasibility Study Business Stakeholder Meeting  
February 8, 2012 5:00 - 7:00 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: JIM CLARK  
Address: 3438 I ST.  
City: EUREKA State: CA Zip: 95503

Representing Name of Organization or Agency: SELF

Comments: PEDESTRIAN CROSSING REFUGES ARE  
IMPORTANT - PEDESTRIAN OVERPASSES BETTER

Please return by March 9th, 2012

US 101 Feasibility Study Business Stakeholder Meeting  
February 8, 2012 5:00 - 7:00 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: *Marian Brady - City Council*

Address:

City: State: Zip:

Email:

Representing Name of Organization or Agency:

Comments: *at Sunset a planned Brewery  
may soon be built - city is working on  
access for from 101 to rear of property  
where brewery will be located - take into  
Please return by March 9th, 2012 account on 101.*

US 101 Feasibility Study Business Stakeholder Meeting  
February 8, 2012 5:00 - 7:00 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: *Marian Brady*

Address:

City: State: Zip:

Email:

Representing Name of Organization or Agency: *City Council*

Comments: *look for access from Victoria  
Place into Bayshore Mall so cars don't  
have to go back to 101 while shopping  
at both places -  
Please return by March 9th, 2012*

US 101 Feasibility Study Business Stakeholder Meeting  
February 8, 2012 5:00 - 7:00 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: *Marian Brady*

Address:

City: State: Zip:

Email:

Representing Name of Organization or Agency: *City Council*

Comments: *look into possibility of entrance  
sign like Rio Dell has as a gateway  
into Eureka - to add character to the  
entrance*

Please return by March 9th, 2012

US 101 Feasibility Study Business Stakeholder Meeting  
February 8, 2012 5:00 - 7:00 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: *Marian Brady*

Address:

City: State: Zip:

Email:

Representing Name of Organization or Agency: *City Council*

Comments: *ascertain if speed limits along  
101 will make synchronization  
impossible on Broadway 45-40-30 -  
lights though downtown are well synched  
Please return by March 9th, 2012 from Broadway to Rst*

Name: Martin Van Landt  
Address: P.O. Box 6276  
City: Eureka State: CA Zip: 95502  
Email: Martynvz@comcast.net  
Representing Name of Organization or Agency:  
Comments: 1. Need to develop bike lane options  
2. I didn't see anything about coordination  
with City on city st portion of system  
3. Were roundabouts considered?  
4. I saw no discussion of parking issues

Please return by March 16th, 2012

Name: Natalie Arrango  
Address: 904 G St  
City: Eureka State: CA Zip: 95501  
Email: NATALIEC-ARRANGO@YAHOO.COM  
Representing Name of Organization or Agency: Redwood Comm.  
Comments: Action Agency

We need continuous sidewalks  
on at least one side  
Please consider bike-ped safety!  
Please return by March 16th, 2012  
And accessibility!  
I Ride + work here daily if  
you would like more input!

Name: Ron Biosca  
Address: 1034 Broadway  
City: Eureka State: Ca. Zip: 95501  
Email: ronbiosca@sbcglobal.net  
Representing Name of Organization or Agency: Brookway Medical  
Comments: Concerned about no turn lane  
at Clark St. - stop light is good.

Please return by March 16th, 2012

Name: Stan Wong  
Address: 1536 3rd. St. #6  
City: Eureka State: CA Zip: 95501  
Email: eswong999@msn.com  
Representing Name of Organization or Agency: Community member

Comments: With the narrowing of Fairfield,  
if the sidewalk is widen just by  
making the sidewalk a wide slab, I would  
be concerned with creating a homeless!  
Please return by March 16th, 2012  
Vagrent area. Some  
landscaping could make  
this area less desirable

US 101 Feasibility Study Public Meeting  
February 16, 2012 4:30 - 6:30 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: Marcella Clem HCADG

Address:

City: State: Zip:

Email:

Representing Name of Organization or Agency:

Comments: THE MAP ~~ALL~~ (HIGH BUILD) APPEARS

TO INDICATE THAT LEFT TURNS FROM

6TH ON TO BROADWAY COULD BE RESTRICTED

AT CERTAIN TIMES, THIS IS NOT THE

PLEASE RETURN BY MARCH 16TH, 2012 CASE, I HOPE

WHAT DO THE MEDIANS DO TO OFF BROADWAY TRAFFIC?

US 101 Feasibility Study Public Meeting  
February 16, 2012 4:30 - 6:30 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: Marcella Clem HCADG

Address:

City: State: Zip:

Email:

Representing Name of Organization or Agency:

Comments: IS THERE A CONSIDERATION OF

RESTRICTING PARKING ALONG BROADWAY TO

ALLOW FOR BIKE LANES?

WILL PEOPLE EVEN USE BIKE LANES ON BROADWAY?

PLEASE RETURN BY MARCH 16TH, 2012

ANY REDUCTION IN DRIVEWAY ACCESS?

US 101 Feasibility Study Public Meeting  
February 16, 2012 4:30 - 6:30 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: Marcella Clem HCADG

Address:

City: State: Zip:

Email:

Representing Name of Organization or Agency:

Comments: ~~XXXXXXXXXX~~

SYNCHRONIZED W/POSTED SIGNAGE INDICATING

THE SYNCHRONIZED SPEED.

PLEASE RETURN BY MARCH 16TH, 2012 19TH AVE & VANNESS ~ SF.

(IT DOES WORK)

US 101 Feasibility Study Public Meeting  
February 16, 2012 4:30 - 6:30 pm  
Wharfinger Building, 1 Marina Way, Wharfinger Great Room

Name: Jacob Pouder

Address: 89810th ST

City: Eureka State: CA Zip: 95501

Email: j.l.pouder@gmail.com

Representing Name of Organization or Agency: SELF / Humboldt Trails

Comments: Good Ideas: closing NB lane of Forsythe in intersection Covered

Broadway / Hobson, Signal @ Clark St, Signal @ Hawthorne, various

Things to explore: Increased bike / ped accessibility: increased /

expected emissions from large truck traffic (Palo Alto) /

PLEASE RETURN BY MARCH 16TH, 2012 (w/holding) Alternative routes for

bike / ped use (trails) easing traffic congestion through

Eureka (possible bypass?)

Name: Jim Rice

Address: 2404 17th St.

City: Seaside State: CA Zip: 95501

Email: jr@humboldt1.com

Representing Name of Organization or Agency:

Comments: - Please incorporate recommendations from <sup>Bill</sup>ESA  
- 11th STREET LIGHTS - traffic calming + 1 bike lane  
- Remove parking - Scenario metrics are vague  
- Coordinate driveways to clarify overall

Please return by March 16th, 2012 needs to reduce conflicts  
note you include "adjacent streets" in the road study -  
most, but they're not addressed in the design. There will  
be impacts on those streets in meetings, would, especially  
for roads & bikes - not deliberate - auto collision in Seaside. X next

Name: Barbara Hosok

Address: 617 4th St

City: Seaside State: CA Zip: 95501

Email: BREUARD@NorthEast.com

Representing Name of Organization or Agency: Lost Coast Brewery

Comments: Please building a Brewery on Sunset Rd  
and will need a medical Break or  
Signal

Please return by March 16th, 2012

Name: Chuck Goodwin

Address:

City: Eureka State: Zip:

Email: CFGOOD13@northeast.com

Representing Name of Organization or Agency:

Comments: INGRESS/EGRESS FOR BICY  
Businesses  
1. LIKE FAIRFIELD CLOSURE!  
2. LIKE FAIRFIELD CLOSURE!  
3. DON'T FORCE TRAFFIC ON TO HERBICK

Please return by March 16th, 2012 & E STS TO BYPASS RDY

Name: MARK MCCORMY

Address: 3740 Broadway

City: EUREKA State: Zip:

Email:

Representing Name of Organization or Agency: M.R. ASH

Comments: CROSS WALKS AT SOUTH  
SIDE OF HENDERSON + Broadway  
INTERSECTION?

Please return by March 16th, 2012

- Beautifying Broadway w/ a planted median will also help offset impacts of <sup>existing</sup> turning restrictions by creating a more attractive & safer environment that will entice more travelers to stop @ businesses on the corridor

California Dept. of Transportation

Attn: Jeffrey Pimentel

c/o: US 101 Feasibility Study

PO Box 3700

Eureka, CA 95502

*Amber!*

ad: adjacent streets -  
happen in these western neighborhoods (most energy-  
city of cellulose) & mitigation for deflected traffic  
needs to be addressed in project design.



Caltrans

- above analysis benefits & impacts of synchronization  
of signals with pulse-like impacts ... interesting idea of  
much lower speed limit that would benefit local feeds  
false impact thru working opportunity

Name: Rick Knapp, President  
Address: P.O. Box 9054  
City: Eureka State: CA Zip: 95502  
Email: info@thumbolite.org

Representing Name of Organization or Agency: Thumbolt Bug Bique

Comments: Computer Assoc

Need to look at narrowing traffic lanes to 10-11 feet to make more room for bike lanes. Even between  
Please return by March 16th, 2012  
Wash 5<sup>th</sup> Stn, IF not 5' for bike lane,  
stripe 4' shoulder, (OVER) →

Name: Tom Peters  
Address: 221 Dullison St  
City: Eureka State: CA Zip: 95501  
Email: tpete@reninet.com

Representing Name of Organization or Agency:

Comments: If light is used at Jacobs for South bound left turns, install a flashing "PREPARE TO STOP" for N bound traffic coming from Eureka  
Please return by March 16th, 2012

Name: Tom Peters  
Address: 221 Dullison St  
City: Eureka State: CA Zip: 95501  
Email: tpete@reninet.com

Representing Name of Organization or Agency:

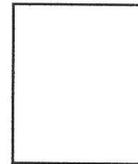
Comments: Instead of on in conjunction with light at Hawthorne, change Henderson to 3 lanes westbound (left turn, thru, 1 ft or through) & improve access to Harris from  
Please return by March 16th, 2012 Broadway end.  
close off Fairfield entirely.

LEFT TURN ARROW for Wash onto  
BROADWAY west to South

Name: HAROLD HILFKER  
Address: 1402 HILFKER LANE  
City: EUREKA State: CA Zip: 95503  
Email: HAROLD @ HILFKER .com

Representing Name of Organization or Agency: HILFKER @

Comments: \*Please don't give up on watercraft drive through to Hearn &  
\* Don't like the Medians - want work  
\* Get Rid of Fairfield & sink the lights  
Please return by March 16th, 2012  
Broadway works for me the way it is.



*South of Wasatch, if  
parking allowed, need at  
least 12' for bikes & parking.*

California Dept. of Transportation  
Attn: Jeffrey Pimentel  
c/o: US 101 Feasibility Study  
PO Box 3700  
Eureka, CA 95502



Name: Allen Bravin  
Address: Palo Alto Boulevard  
City: San Jose State: CA Zip: 95131  
Email: \_\_\_\_\_  
Representing Name of Organization or Agency: The Valley Area  
Comments: No not like restrictions left  
turn lanes depending on time of day.

Please return by March 16th, 2012

Name: DAVE BRUNNUS  
Address: 2427 FAIRBRIDGE  
City: EVERETT State: CA Zip: 95503  
Email: de2179@att.com  
Representing Name of Organization or Agency: AART  
Comments: like idea of stoplight @  
fairview

Please return by March 16th, 2012

Name: Pack Littlefield  
Address: 1450 Broadway  
City: San Jose State: CA Zip: 95101  
Email: nick@surkavaturalleads.com  
Representing Name of Organization or Agency: \_\_\_\_\_  
Comments: We like the improvements  
generally but cannot support closing  
the fund lane for our 6 businesses  
off the old 15th st - may a driveway  
just @ ENF

Please return by March 16th, 2012

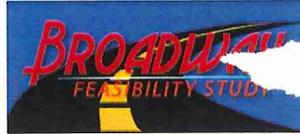
# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Judy Goppert  
Address: 2820 Lowell St  
City: Eureka State: CA Zip: 95501  
Representing Name of Organization or Agency: Senior Action Coalition

Comments: ① need for a light at Hawthorn & Broadway ② Increase safety for pedestrians on Broadway - i.e. kind of median safe zone that is wide enough.

Please return card by **March 15, 2014**  
You may also email your comments to [kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



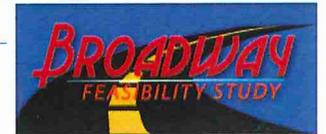
# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Mary Ella Anderson  
Address: 1875 Arabian Ln  
City: Arcata State: CA Zip: 95521  
Representing Name of Organization or Agency: Senior Action Coalition

Comments: I always feel unsafe on Broadway & want you to slow things down & make street safer for pedestrians and cyclists

Please return card by **March 15, 2014**  
You may also email your comments to [kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



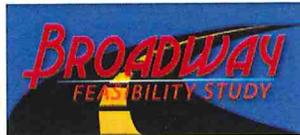
# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Jan O'Neill  
Address: PO Box 820  
City: Bayside State: CA Zip: 95521  
Representing Name of Organization or Agency: Senior Action Coalition

Comments: Need wide median and more signs to control speed & let pedestrians cross Bdwy safely.

Please return card by **March 15, 2014**  
You may also email your comments to [kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Anne Hubbard  
Address: 4854 Valley East #1  
City: Arcata State: CA Zip: 95521  
Representing Name of Organization or Agency: Senior Action Coalition

Comments: Pedestrian Refuge & bike lanes

Please return card by **March 15, 2014**  
You may also email your comments to [kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



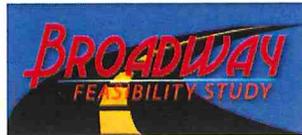
# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Sue Tatro  
Address: 3106 Harris St  
City: Eureka State: \_\_\_\_\_ Zip: 95503  
Representing Name of Organization or Agency: Senior Action Coalition

Comments: \_\_\_\_\_  
Signal at Hawthorn

Please return card by **March 15, 2014**  
You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



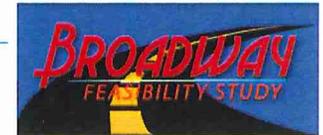
# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Leslie Zondervan-Droz  
Address: 73 Lanford Rd  
City: Trinidad State: CA Zip: 95570  
Representing Name of Organization or Agency: Senior Action Coalition

Comments: Please install a light at Hawthorne  
and Broadway in Eureka also with a nice  
WIDE pedestrian median so older people  
can get across Broadway safely.

Please return card by **March 15, 2014**  
You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Kevin Dreyer  
Address: 2355 CENTRAL AVE SUITE D.  
City: McKINLEYVILLE State: CA Zip: 95519  
Representing Name of Organization or Agency: \_\_\_\_\_

Comments: IT LOOKS TO ME LIKE (4)  
IS THE "BEST OF ALL WORLDS" GOOD  
COMPROMISES, DECENT FLOW, SAFER  
BEST FOR BUSINESSES, ETC.  
Thanks for taking input, Kevin

Please return card by **March 15, 2014**  
You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Minnie Wolf  
Address: 4401 Cedar St  
City: Eureka State: CA Zip: 95503  
Representing Name of Organization or Agency: self

Comments: Remove all BIKE lanes  
from Broadway  
use other routes

Please return card by **March 15, 2014**  
You may also email your comments to  
kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Brett Gronemeyer  
Address: info@humbike.org / www.humbike.org  
City: Eureka State: CA Zip: 95501  
Representing Name of Organization or Agency: HBBCA

Comments: If additional lane is added to Henderson,  
please consider a bike lane for EB, uphill bicyclists.  
Bike lanes on Broadway, especially Wabash to 4th/5th are  
needed. In the meantime, we would like to see  
sharrow lane markings for that segment.

Please return card by **March 15, 2014**  
You may also email your comments to  
kevin.tucker@dot.ca.gov



Also  
WB,  
too!

# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Judy Anderson  
Address: 4971 Lundblade Drive  
City: Eureka State: CA Zip: 95503  
Representing Name of Organization or Agency: citizen

Comments: I am in favor of increased number  
of protected crosswalks, Raised median -  
basically Scenario #1 seems  
best choice

Please return card by **March 15, 2014**  
You may also email your comments to  
kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Minnie Wolf  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Representing Name of Organization or Agency: Keep Eureka

Comments: Beautiful  
add TREES

everywhere possible  
need 1,000 more trees

Please return card by **March 15, 2014**  
You may also email your comments to  
kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: GREG WILLISTON  
 Address: 2888 SPEARS RD  
 City: Eureka State: CA Zip: 95503  
 Representing Name of Organization or Agency: \_\_\_\_\_  
 Comments: LIKE SCENARIO #1 best

Please consider closing Koster  
of the new Holiday Inn between Dal Norte  
& Wabash

Please return card by **March 15, 2014**  
 You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Hollie Klingel  
 Address: 230 Wabash #4  
 City: Eureka State: CA Zip: 95501  
 Representing Name of Organization or Agency: myself - over 70  
 Comments: very slow

Crosswalk at Broadway & Clark would  
make a dangerous area worse -  
1/2 block from curve going South on  
Broadway - jaywalking already a problem  
there.

Please return card by **March 15, 2014**  
 You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Pam Schneider  
 Address: 2844 Fairfield St  
 City: Eureka State: CA Zip: 95501  
 Representing Name of Organization or Agency: Bayview Motel  
 Comments: \_\_\_\_\_

I support the dedicated right  
turn on Henderson St.  
Scenario 4.0 & 6.0

Thank you!

Please return card by **March 15, 2014**  
 You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: WILLIAMS  
 Address: 2830 OCEAN AVE  
 City: EUREKA State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Representing Name of Organization or Agency: \_\_\_\_\_  
 Comments: \_\_\_\_\_

BETTER OVERHEAD LIGHTING  
THROUGHOUT THE CORRIDOR  
FOR NIGHT TIME VISIBILITY - ESPECIALLY  
FOR SEEN PEDESTRIANS WHO DO NOT  
PRESS TO BE SEEN OR WHO

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[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Colleen Tarr Hulbert

Address: Pmb 332, 3144 Broadway

City: Eureka State: CA Zip: 95501

Representing Name of Organization or Agency:

Comments: Regarding restricted left turns @ Washington & Clark - both these intersections provide access to two large employers - Post office and Dept. Health & Human Services - how will that affect their travel to work?

Please return card by March 15, 2014  
You may also email your comments to kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: George Clark

Address: 1091 Vista Drive

City: Eureka State: CA Zip: 95503

Representing Name of Organization or Agency: Self

Comments: Reduce speed limit to 25 like Grand Pass & Save lives!  
Better timing on signals.  
Thank you!

Please return card by March 15, 2014  
You may also email your comments to kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Dan Knapik Dan's Auto & Tire

Address: 1314 Broadway

City: Eureka State: CA Zip: 95501

Representing Name of Organization or Agency:

Comments: Will there be mid block left turn lanes for cars going north or south will every small business be considered! Accessibility is a must for our

Small Business  
Please return card by March 15, 2014  
You may also email your comments to kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: JUDY GRAY

Address: 333 14th St

City: Eureka State: Zip:

Representing Name of Organization or Agency:

Comments: Could someone...  
Walkers...  
Walkers...  
Walkers...

Please return card by March 15, 2014  
You may also email your comments to kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Bonnie MacGregor  
Address: 1644 Bond Ave.  
City: McKeaneyville State: CA Zip: 95519  
Representing Name of Organization or Agency: Senior Action Coalition

Comments: 2 1/2' medians will not accommodate walkers (Seniors/disabled) or strollers (young parents w/children) no crossing pedestrians w/dogs. - bicycles can use Waterfront Drive + cross streets to access.

Please return card by March 15, 2014  
You may also email your comments to [kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: JOANN Schuch  
Address: 924 Villa Way  
City: ARCATA State: CA Zip: 95521  
Representing Name of Organization or Agency: SENIOR ACTION

Comments: COALITION  
GOOD OVERALL PROPOSALS. PLEASE BE AWARE OF SENIOR PEDESTRIANS. SLOWER MOVING AND NEED TO CROSS BROADWAY AT SPECIFIC LOCATIONS. →

Looking for a light at L + 4th St  
Please return card by March 15, 2014  
You may also email your comments to [kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Linda Atkins  
Address: 825 S St  
City: Eureka State: CA Zip: 95501  
Representing Name of Organization or Agency: City Council

Comments: Landscaping and trees act as traffic calmers and actually are a safety improvement. Like option 1 with landscaping.

Please return card by March 15, 2014  
You may also email your comments to [kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Stephen Lewis  
Address: 2017 Adams Cir  
City: Arcata State: CA Zip: 95521  
Representing Name of Organization or Agency:

Comments: can cooperation w/city of Eureka be possible to 1) connect parking lots of Social Sec/Big Five, etc + Tara Bell etc to connect at Bayshore Mall signal <sup>by Henderson</sup> or parking lot? We cannot exit Big 5/S.S. either way most of the time.

Please return card by March 15, 2014  
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# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Lee Cummings

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Representing Name of Organization or Agency: \_\_\_\_\_

Comments: The south bound

traffic on Fairfield, is  
going where? It is  
heavy! Can Wash handle  
it?

Please return card by March 15, 2014  
You may also email your comments to  
kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Gary Knudsen

Address: 1905 Hutton St

City: Eureka State: Cal Zip: 95501

Representing Name of Organization or Agency: Self

Comments: I see a dedicated right turn lane

for Henderson, Woodliff! Why is there  
not a dedicated right turn lane on  
Wabush westbound? Same problem as  
Henderson.

Please return card by March 15, 2014  
You may also email your comments to  
kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Marcus Drown

Address: \_\_\_\_\_

City: Eureka State: CA Zip: \_\_\_\_\_

Representing Name of Organization or Agency: \_\_\_\_\_

Comments: \_\_\_\_\_

prefer Sen. 5/6 and create bike paths elsewhere  
turn up Henderson insignificant proximate to Harris  
additional lights will only slow/congest traffic  
drivers here too dumb for peak hour turn restrictions

Please return card by March 15, 2014  
You may also email your comments to  
kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Melvin Wright

Address: 1130 Broadway

City: Eureka State: CA Zip: 95501

Representing Name of Organization or Agency: WRIGHT R.V. SALES

Comments: IF South bound RAMP - MOTOR HOMES

OR TRAILERS CAN NOT TURN INTO MY BUSINESS I  
WILL HAVE TO CLOSE.

A LIGHT & CROSS WALK AT CLARK IS THE ONLY  
THING THAT WILL SLOW TRAFFIC COMING AROUND  
CORNER AT VERLON

Please return card by March 15, 2014  
You may also email your comments to  
kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

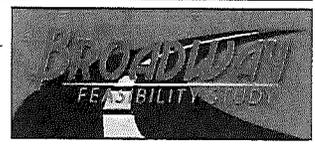
February 27, 2014

Name: Michele McKeegan  
Address: 2020 Fern St  
City: Eur State: \_\_\_\_\_ Zip: 95503

Representing Name of Organization or Agency: Keep Eureka Beautiful

Comments: Prefer scenario #1.0  
Medians would be great  
but need to be landscaped  
incl. w/ trees not just  
low shrubs

Please return card by **March 15, 2014**  
You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Stan Wong  
Address: 1335 Union St. #6  
City: Eureka State: CA Zip: 95501

Representing Name of Organization or Agency: Voter

Comments: Since the first meeting in 2012  
the Hikshiri trail has open with access  
on Truesdale St. It has become popular  
but access off of Broadway is not  
part of study period 2002-2012.  
Will this be added?

Please return card by **March 15, 2014**  
You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Stan Wong  
Address: 1335 Union St. #6  
City: Eureka, CA State: CA Zip: 95501

Representing Name of Organization or Agency: Voter

Comments: When one lane of Fairfield is  
closed will there be a wide barren  
sidewalk or will the curbs be moved  
trees & bushes be planted?

Please return card by **March 15, 2014**  
You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: Russ Biasca  
Address: 414 Broadway  
City: Eureka State: Ca Zip: 95501

Representing Name of Organization or Agency: \_\_\_\_\_

Comments: Keep center turn lane  
no bicycles or bike lane  
Close north Little Fairfield  
Hawthorne + Clark light OK  
slow traffic down  
control J walkers

Please return card by **March 15, 2014**  
You may also email your comments to  
[kevin.tucker@dot.ca.gov](mailto:kevin.tucker@dot.ca.gov)



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: MEREDITH BIRSCIA

Address: 916 BROADWAY

City: EUREKA State: CA Zip: 95501

Representing Name of Organization or Agency: DON'S RENT-ALL

Comments: DDAWAY W/BIKE LANES, ROUTE BIKE TRAFFIC TO OLD TOWN/WATERFRONT DR. STOP LIGHTS NAUTHORNE + CLARK O.K.

Please return card by March 15, 2014  
You may also email your comments to  
kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: DEAN SLONE

Address: 1755 SUNSET DRIVE

City: EUREKA State: CA Zip: 95503

Representing Name of Organization or Agency: SUNSET RD ASSOC

Comments: TRAFFIC WILL INCREASE DRAMATICALLY WHEN LAST COAST BREWERY GETS IN OPERATION. THE RIGHT TURN ON RED FROM K MART TO NORTH BOUND 101 MUST BE RESTRICTED TO PROVIDE TRAFFIC GAPS FOR SOUTH BOUND BREWERY TRAFFIC TO GET INTO THE SITE.

Please return card by March 15, 2014  
You may also email your comments to  
kevin.tucker@dot.ca.gov



# Broadway Feasibility Study Public Meeting

February 27, 2014

Name: JEAN GLASSONE

Address: 1005 65E

City: EUREKA State: CA Zip: 95501

Representing Name of Organization or Agency: KEEP EUREKA GREEN

Comments: Please plant at least a 1000 trees on 101.

Please return card by March 15, 2014  
You may also email your comments to  
kevin.tucker@dot.ca.gov



## Email Comments

Name	Affiliation	Comments
Whitney Wirt	Community Member	I am a home owner living in Eureka, CA. Please see the attached information on how to make this a better city to live in.
Kelly Karaba	Community Member	Broadway Street in Eureka is an eyesore. Your environmental status with the community is failing. Please plant as many trees as possible along the eureka broadway improvement project. Eureka needs beatification just as much as it needs transportation safety improvements. Trees not only provide for pleasing aesthetics they create a buffer between traffic and pedestrians as well as offsetting the effects of vehicle emissions, especially if more co2 asorbing and oxygen producing species are planted.
Kareen Van swearingen	Community Member	I am a resident of Eureka Ca. The freeway runs through the city and drastically needs some trees planted. It is bad enough there is no bypass, bit inexcusable how barren and ugly 101 is. It is actually quite an embarrassment that it is so ugly and unappealing. Trees would be a wonderful improvement in every way conceivable and would help transform very large part of our city toward some semblance of something beautiful and a city to be proud of. I believe this is a chance to help fundamentally transform a city. Thank you.
Eric V. Kirk	Community Member	More trees please! Right now the whole strip does nothing to attract tourists or make people want to move here. It does nothing except to inspire suicide.
Chloe	Community Member	Hi there, I am writing you to voice support for trees on Broadway. For so many reasons this is a great project for out community. Thank you for your consideration.
Paul Moss	Community Member	Please provide as many trees as possible along the Eureka broadway improvement project. Eureka needs beutification just as much as it needs transportation safety improvements. Trees not only provide for pleasing aesthetics they create a buffer between traffic and pedestrians as well as offsetting the effects of vehicle emissions, especially if more co2 asorbing and oxygen producing species are planted. Thanks for taking the time to read all of the concerned citizens comments

Name	Affiliation	Comments
Dale Warmuth	Leon's Car Care Center	<p>Given the recent fatality in front of Lithia, why isn't Broadway south of McCullen Avenue being divided? Other than the two traffic lights, what is the plan for pedestrian crossing? With bicycle lanes, how do you plan to accommodate the 3' foot clearance to cars and trucks which is now required by law? Why doesn't CalTrans risk the legal issues and pursue Waterfront Drive behind Bayshore Mall and Palco marsh? Are you planning for the waterfront development at the marina center? Have you looked at the off camber pitch on the north bound lane at Clark &amp; Grant? So vehicles are not pitched into Leons old building at 939 Broadway. As access is restricted from left turns what is the process of getting a property tax reduction given that your surly reducing property values. regarding the US Forest service office on Bayshore way what be the process for north bound travelers with trailers and such for access. I picture this driving aimlessly left at every traffic signal so to get back to "that place" where you use to make a left turn, and then driving in the opposite direction to where you want to go and when done with your business you will go find the next traffic signal then turn any way you can so to find a way back to the direction you started. Great! O and while you were rubber necking for a way to turn you hit one of those pedestrians that run/walk back and forth a issue that you haven't fixed in the first place If water front drive is environmentally impossible, build a tube or bridge at elkriver to samoa and take this traffic to navybase road to 255 to 299</p>

Name	Affiliation	Comments
Aimee Hennessy	Community Member	<p>Please take the benefits of urban street trees into account in the Caltrans Broadway Feasibility Project. As it is, I feel unsafe as a pedestrian on Broadway. Walking across Broadway to the shopping center where Eureka Natural Foods is located, or using the bus stop near Anglin's Second Hand, has become too dangerous for many of the neighbors I've talked to who live in the neighborhood across Broadway. Most prefer to drive their cars less than four blocks just to avoid crossing Broadway by foot or bicycle. In the course of one month I myself was nearly hit by cars on that stretch of Broadway, while crossing intersections with a crossing signal, SEVEN times by drivers who were not paying attention and apparently not expecting to see pedestrians on Broadway. Some of the measured benefits of street trees include things that are very important for the blighted Broadway area of Eureka: "Create safer walking environments, by forming and framing visual walls and providing distinct edges to sidewalks so that motorists better distinguish between their environment and one shared with people. If a motorist were to significantly err in their urban driving task, street trees can deflect or fully stop a motorist from taking another human life.</p>
Aimee Hennessy	Community Member	<p>Trees call for planting strips, which further separate motorists from pedestrians, buildings and other urban fabric. Increased security. Trees create more pleasant walking environments, bringing about increased walking, talking, pride, care of place, association and therefore actual ownership and surveillance of homes, blocks, neighborhoods plazas, businesses and other civic spaces. "Less drainage infrastructure. Trees absorb the first 30% of most precipitation through their leaf system... Another percentage (up to 30%) of precipitation is absorbed back into the ground and taken in and held onto by the root structure... Storm water runoff and flooding potential to urban properties is therefore reduced."</p>
Aimee Hennessy	Community Member	<p>More benefits of street trees can be found at the following links:  <a href="http://www.walkable.org/assets/downloads/22%20Benefits%20of%20Urban%20Street%20Trees.pdf">http://www.walkable.org/assets/downloads/22%20Benefits%20of%20Urban%20Street%20Trees.pdf</a>  <a href="http://www.theatlanticcities.com/neighborhoods/2012/07/case-more-urban-trees/2768/">http://www.theatlanticcities.com/neighborhoods/2012/07/case-more-urban-trees/2768/</a>  <a href="http://www.treebenefits.com/calculator/">http://www.treebenefits.com/calculator/</a></p>

Name	Affiliation	Comments
Ron Kuhnel	Community Member	<p>I object to the assertion that landscaping is not to be included in the overall proposed design. Trees and other landscaping should be part of this, including prospective locations. In particular from Wabash to the southern terminus of the project there is an opportunity for median trees, and on both sides of right-of-way along with other landscaping. Without this being included in the overall design I find the proposal inadequate.</p>
Juliana Strubinger	Community Member	<p>Broadway/highway 101 would be greatly enhanced by the installation of trees + landscaping. This would be the simplest &amp; cheapest way to increase safety, improve wastewater run-off, decrease blight, and increase the beauty of the area. One really great example of adding a median strip/trees &amp; landscaping has been Divisadero Street in San Francisco. The street is much safer and less blighted, and many years later is a much better place all from the simple installation of landscaping.</p> <p>As a Eureka resident I support trees/landscaping on Broadway. If there's anything else I can do to support the project, please let me know.</p>
Joel Mielke	Community Member	<p>Caltrans seems to be all about efficiency, but Broadway/101 is a hellishly ugly and dangerous stretch of road through Eureka.</p> <p>Landscaping with an abundance of trees could help to calm traffic and make Broadway less bleak. Who wouldn't want that?</p>
Emily Sinkhorn	Redwood Community Action Agency	<p>Thank you for the open house last night. Thank you for the thorough analysis of scenarios that focus on improved safety along the corridor, particularly for pedestrians and cyclists. While scenario 1 would have the most safety improvements for all users of Broadway, I could imagine that businesses along the corridor will not be supportive of the continuous median with breaks only at signalized intersections. Therefore, I wanted to also voice support for scenario 3 which would allow turning movements mid-block in to certain business areas along the corridor. I appreciate that Caltrans has now incorporated bike lanes from Kmart to Wabash in all scenarios. Thank you for focusing on complete streets during this feasibility study.</p>
Nancy Melin	Wendy's (East Bay Equities)	<p>We are writing to you on behalf of the proposed median site in front of our Wendy's Location on 529 Broadway Eureka, CA. We are concerned that a median at this site will block any access going southbound on Highway 101. This will greatly reduce our business and detour people from visiting our restaurant because it will be too difficult to access as 6th street is a one way street. We greatly oppose this median site and hope you understand our concerns. I have attached a picture of the street view so you can see where it will block access into our parking lot. The Wendy's building shown is not current as we have a brand new building on the lot (google hasn't updated the look yet).</p>

Name	Affiliation	Comments
Bret Gronemeyer	Humboldt Bay Bicycle Commuters Association	<p>Class II bikeways (bike lanes) on Broadway from K-Mart to 4th Street would benefit both commuter and touring bicyclists. Commuter and Touring bicyclists regularly use the entire segment, as it is the most direct route through Eureka. A parallel waterfront recreational path, while a great benefit for recreational bicyclists, may not serve the needs of all commuter and touring bicyclists. Broadway also has many establishments that both commuter and touring bicyclists want to access, including shopping, food, and lodging. Medians will enhance the bicycling experience on Broadway, as it will significantly decrease conflict points between opposite direction motorists turning left across the path of bicyclists. Regularly spaced median openings will help minimize out of direction travel for bicyclists. Pedestrian cuts through the median can also benefit bicyclists (when they dismount the bicycle and become a pedestrian). Increasing the number of protected left turn movements at signals would benefit bicyclists. Increasing the number of protected crosswalks would benefit bicyclists trying to get across Broadway (when they dismount the bicycle and become a pedestrian).</p>
Bret Gronemeyer	Humboldt Bay Bicycle Commuters Association	<p>If a dedicated right turn lane is added to Henderson Street, consider adding bicycle facilities in order to close the gap in the bikeway on Henderson between Fairfield and Broadway. Sharrow lane markings may suffice for westbound bicyclists, as it is downhill. It would be desirable to have a bike lane, at the approach to Broadway, between the #2 lane and the right turn only lane to position westbound bicyclists turning southbound onto Broadway to the left of the proposed Right Turn Only Lane.</p>
Josh Levine	Community Member	<p>I would like to add a comment to the Broadway Feasibility Study. I am very happy to see that bicycle infrastructure is being considered for many of the scenarios, however I am rather disappointed to see that there is not a Class 1 facility, or separated cycle track being considered. Broadway is a well traveled corridor by many modes and could serve as an example to the greater Humboldt area as what a complete street should look like. There is adequate space, as shown in the typical section, to have a world class cycle track installed along Route 101. Class 2 facilities work for cyclists who are comfortable riding next to traffic, experienced riders, but they do not encourage new users, or users who are less comfortable riding in traffic, like Class 1 separated facilities do. Caltrans has been showing that it can be a leader in the field of transportation, here is another opportunity that I hope is not wasted.</p>

Name	Affiliation	Comments
Randy Gardner		<p>I was unable to attend yesterday's meeting, because unlike 99% of the pedestrians crossing Broadway, I have a job, and had to spend the time at work, being a productive member of society. I was planning on ignoring it, but after reading the rubbish in the paper today, it's clear that someone is not getting the point, and unless people complain, it's just going to get worse.... So, here's some more public feedback to consider. Your job is to keep traffic moving. You're the department of transportation, not the department of worthless oxygen wastes wandering into traffic. NONE of the scenarios will speed up traffic flow for more than a select set of routes. More signals will not speed up traffic flow. Forcing people to go around the block on sidestreets to access a business will not reduce their trip time. Closing northbound fairfield, forcing traffic on it to go down hawthorne and through a second signal, will not make their day go any faster. Preventing left turns won't make people get where they're going sooner. Bike lanes, taking up space that could be used for useful traffic, won't get people to work on time. More crosswalks will increase the amount of time traffic spends stopped, not the time it spends moving. Removing parking will not make parking faster - especially if you want to shop at a business with no lot. Raised medians have yet to ever make getting somewhere easier, and never will. What possible delusion results in thinking that replacing space used by vehicles with space that can't be used by vehicles will improve the movement of vehicles? The caltrans website lists your location as Scaramento. Maybe things are different there than here. Here, pedestrians, especially the ones that wander around Broadway, are not useful contributors to society.</p>

Name	Affiliation	Comments
Randy Gardner		<p>(In fact, most of them are outright parasites, but that's besides the point.) Making them walk down the block to find a crossing is not a problem, never has been a problem, and never will be a problem. Hell, banning pedestrian access entirely would probably make the whole area better!</p> <p>The current problem with Broadway is too much traffic moving too slowly. One of the major causes of this, as seen by driving down it repeatedly for work (you know, those of us with jobs, unlike the pedestrians and cyclists, earning and paying the tax dollars that you're spending), is idiotically timed lights. As far as I can tell, based purely on observations while driving, is they change based on sensors immediately before the lights, with a long delay. If the lights were properly timed, they'd turn green right before a group of vehicles got to them, ensuring smooth traffic flow. Instead, they do the exact opposite, and turn red! One signal changes to red, and creates a gap in traffic. The next signal senses this gap in traffic only after the gap travels all the way to it, starts its delay, and turns red too. But in this time, the first signal has turned green again, and there's now a dense pack of cars heading to the second signal... which has to stop again, as the second signal turns red right before the cars get to it. My not-an-expert-on-traffic-signals suggestion, that I've been suggesting for several years now, would be to install more sensors a good distance before the signal, and shorten the time it takes the light to turn red when it doesn't sense any vehicles to as near-instant as possible. Yes, I'm advocating improving traffic flow by turning the light RED sooner!</p>
Randy Gardner		<p>This way, when there's a gap in the traffic, the signal quickly turns red and lets traffic in from the sidestreet, then turns green before traffic comes in on the main road again, allowing traffic to keep moving rather than stopping repeatedly. I'd imagine this is relatively inexpensive, and could be done by a public works crew in a few days per signal. Coordinating the signals with a fancy computer system would have the same effect, but probably cost a whole lot more. I'm assuming cost is why it wasn't done in the first place. Adding concrete to the middle of a road has never improved traffic flow, in any way, ever. As an example, R st/255 is now completely screwed up by having concrete in the middle of it. Ever notice there's solid bands of tire tracks going across the median, even where it has a pile of cemented rocks in the middle? That's because it's easier and faster than going six blocks around in a pointless loop! The simple action of going straight on 6th street takes 3-5 minutes! Even if you come up with a scheme that improves through traffic, it screws local traffic. Really want to help improve Broadway? Give us a Eureka bypass - there's no need for freeway traffic to be going through the downtown area of a city, and I consider it highly undesirable. I'm sure the various peddlers of worthless trinkets will object to you hurting their theoretical profits by not forcing tourists through town, but all the rest of us would love it. Build a nice metal bridge (not ugly concrete- something actually pleasing to look at.</p>

Name	Affiliation	Comments
Randy Gardner		You keep building bridges for the SF bay, now build another one for our bay...) spanning the two jetties, with a new freeway heading from around the bottom of loleta hill out to the south jetty, turn 255 into a 4-lane freeway with frontage roads, then build a causeway around the arcata marsh so it doesn't have to run through arcata. Getting traffic off roadway will make far more of an improvement than anything you can do to roadway! But, that's expensive...
Peter LaVallee	Community Member	P.S. I get really, really tired of the "x percent more accidents than similar roads, so we have to fix the roads" argument being trotted out over and over. Correlation does not imply causation - and problems on roads doesn't mean problems caused by roads. Ever consider maybe we just have x% more senile, stoned, slow, soused, self-absorbed, stupid, psychotic, cell-phoning, sedated, or otherwise useless people, rather than the road being the problem? You can't fix people with roadwork.
Mike Newman	Eureka City Councilman	P.P.S. Same goes for the "x% of accidents involve speeding, so we need to slow everyone down!" argument, that was featured prominently in the newspaper today. Maybe some percent of accidents involved at least one vehicle that was speeding, but given as a much greater percentage of traffic is speeding (except when stuck at a light), a better argument would actually show that speeding people are safer! If 90% of people are involved in only 50% of accidents, that means the last 10% of slow people are causing the other 50% of accidents...
Stan Wong	Community Member	Hi, I was at the February 27th meeting. there was a lady that did not like the idea of a signal at Clark St., I think that is a good idea. Also the 12' wide median should be more than a plain strip of concrete. That maybe utilitarian but ugly. Caltrans needs to take this opportunity to make it nice to the eye as well. It may be too skinny for some trees but some native plants would be low maintenance. At the shoulders of both directions is the place for trees. This is the time to include it into the Plan. If it is not included now the trees and landscaping will fall out of the finished Plan.
Trisha Lotus	Community Member	Please plant more trees on Broadway in Eureka. It is known that trees are a good traffic calming technique. Also, when you put in crosswalks for people to cross Broadway, please use the blinking lights on the sidewalks. One car slows to let somebody cross and the other car is clueless and barrels right on through.



## HUMBOLDT COUNTY ASSOCIATION OF GOVERNMENTS

611 I Street, Suite B  
Eureka, CA 95501  
(707) 444-8208

<http://www.hcaog.net>

March 28, 2014

Kevin Tucker  
Project Coordinator  
P O BOX 3700  
Eureka, CA 95502-3700

RE: Input on the Refinements and Analysis of Potential Improvement Scenarios for the  
Broadway Feasibility Study

Dear Kevin,

Thank you for making presentations to the Humboldt County Association of Government's (HCAOG) Technical Advisory Committee (TAC) and Board of Directors (Board). This letter provides HCAOG's initial and general comments on the refinements and analysis of potential improvement scenarios for the Broadway Feasibility Study. I appreciate that although the official comment period ended on March 15, you are open to accepting our comments after the presentation to the Board.

We commend Caltrans for devoting the time, innovation and focus on the Broadway corridor for last several years. We are happy to see the Greater Eureka Area Microsim model put to use on a systematic approach. The proposed improvement scenarios provide a vision that will allow the region to look at issues on a system wide basis as opposed to spot engineering that often 'kicks the can down the road', literally onto our local streets and roads. Please consider the following comments were vetted at the TAC meeting held on March 20, 2014 and the Board meeting held on March 27, 2014.

- Bike lanes should either be off Broadway completely or provided continuously along the corridor. Ending the bike lanes abruptly, as proposed in a number of the scenarios, will not necessarily mean that bicycle riders will divert to off system routes. They will most likely use the sidewalks or the travel lanes on the corridor. At a minimum, a five foot shoulder should be provided for bicycle traffic on the entire stretch of the corridor.
- Install 2.5 foot medians instead of 12 foot medians. As pointed out by HCAOG's TAC, larger medians are costly to maintain and most importantly could impede

emergency vehicle maneuvering. This reduction could also ensure adequate room for bicycle lanes and/or routes on the corridor. The travel ways on the corridor are high value real estate. A 12 foot median does not appear to be the best use of the land.

- HCAOG supports the installation of a signal at Hawthorn Street in conjunction with the closure of Fairfield Avenue. Although we have not seen the results of the off system movement of traffic through modeling or the temporary closure of Fairfield Avenue last year, it would be surprising to not see an increase in congestion and poor mobility for all modes if the closure happens without the new signal. In addition, the signal will serve the low income population at the Serenity Inn by providing safe vehicle, bicycle and pedestrian access across the highway. We request that these two improvements happen in concert. There is no support or understanding for the signal at Clark Street.
- Keep safety as the top priority. The final report should be finalized in close consultation with our local and state emergency responders. Limiting left hand turns should be analyzed on a case by case basis as an extra minute delay of the fire or police department could cost a life. The installation of emergency vehicle preemption should be installed coincident with the installation of medians to ensure that first responders reach emergency scenes more quickly and safely.
- It is not clear if U-Turns will be allowed. The prohibition of U-Turns will absolutely increase congestion on adjacent and simply move the maneuver down the road, onto the local road.

It is our expectation that these comments are not simply included in the final report but considered in the final improvement recommendations. Our TAC and Board are open and willing to discuss these comments at any future meeting.

Sincerely,



Susan Ornelas  
HCAOG Chair



Marcella Clem  
Executive Director



# Humboldt Bay Fire

Serving the City of Eureka and Greater Eureka Areas since 2011

March 4<sup>th</sup>, 2014

Ralph Martinelli  
Advanced Planning Office  
Caltrans  
1656 Union  
Eureka, CA 95501

Dear Ralph,

Thank you for inviting us to attend the Combined Technical Advisory Group meeting last week at the Wharfinger Building. We are excited about the prospect of improved safety and traffic flow on Broadway.

We are looking forward to reviewing the specifications for the proposed median. As discussed a drivable median should be installed to facilitate emergency apparatus access to the opposite side.

Enclosed is a letter from us to Jeff Pimental following the last TAG meeting in February 2012. It outlines our concerns re the project's potential impacts on public safety. Several of these impacts can be mitigated to some level with a drivable median.

I would like to elaborate on item 3 in the letter; access to fire hydrants. The letter addresses the project related impacts to fire hydrant access. In many places along the project long stretches of Broadway are protected by hydrants on one side of the road only. A median would obstruct our ability to use those fire hydrants for a fire on the other side.

I'd like to add is that under the current conditions a fire on the opposite side of the road as a fire hydrant requires us to run our fire hoses across Broadway which requires us to close Broadway. This creates a safety hazard to motorists and firefighters and significantly impacts traffic. A fire on the same side of the road as a fire hydrant may require the closing of only two lanes.

Regardless of the development of this project I'd like to encourage Caltrans to include the evaluation of existing fire hydrants in any future development or maintenance projects. When possible, including the installation of new fire hydrants for coverage on both sides of the street would minimize traffic impacts and safety hazards.

We would welcome the opportunity to discuss this with your office and be included in future maintenance and other project planning.

Once again thank you for inviting us to attend the meeting and review and comment on the project proposal. Please contact me if you I can be of any assistance.

Rusty Goodlive  
Fire Marshal

Cc: Jeffrey Pimental

3. Fire hydrant access will have to be evaluated and mitigated. In many places along the project long stretches of Broadway are protected by hydrants on one side of the road only. A median would change current conditions and obstruct our ability to use those fire hydrants for a fire on the other side. The best mitigation measure would be the installation of additional hydrants. Other measures could be drivable medians or median breaks.
4. Access across the medians should be evaluated. There will be at least one several block long median without a break between Hawthorne and Henderson impacting access to northbound Broadway from the west side and southbound from the east. Access to vehicle collisions would be restricted for emergency vehicles responding on the other side of the median. Periodic drivable breaks should be considered.

Once again thank you for inviting us to attend the meeting and review and comment on the project proposal. Please contact me if you I can be of any assistance.



Rusty Goodlive  
Fire Marshal



# CITY OF EUREKA

## PUBLIC WORKS/ENGINEERING DEPARTMENT

531 K Street • Eureka, California 95501-1146 • [www.ci.eureka.ca.gov](http://www.ci.eureka.ca.gov)

Public Works: (707) 441-4203 • Engineering: (707) 441-4194

March 28, 2014

Kevin Tucker  
Project Planner  
Caltrans, District 1  
Eureka, CA

Subject: Broadway Feasibility Study—Public Meeting Comments

Dear Mr. Tucker,

The City of Eureka is providing comments on the State's Broadway Feasibility Study (Study) by this letter. Several City representatives attended the February 27, 2014 public meeting at the Wharfinger Building and most of the comments are based on the presentations at that meeting. After discussions with State staff involved with the Study, it is our understanding that the final Study Report will not propose a recommended project, but will instead identify alternative modifications that will enhance traffic safety and operations.

City transportation staff has enjoyed and appreciates the ongoing dialogue we have with Caltrans staff through the GEATAG and other interactions. Obviously we share many common goals and responsibilities with the State given that the highway traverses a significant portion of our community. Any modifications to Broadway will affect the citizens of Eureka as well as our police, fire and public works departments. The City respectfully requests continued collaboration not only during the Study, but also after, as the process of identifying a recommended project that addresses traffic safety and operational issues advances.

With regard to the scenarios presented at the February public meeting, we have received some concern from the business community regarding use of medians resulting in loss of access to their businesses. In addition, the City has concerns about diverted traffic associated with the elimination of left turn movements, both at the medians and at the proposed signalized intersections.

We continue to believe that consideration for the closure of northbound Fairfield necessitates full signalization at the Hawthorne/Broadway intersection. We also think it would be good if the Study addressed issues at the Henderson/Broadway intersection, but understand that may be outside the scope of the study.

### Public Works

*Equipment Operations • Source Control/Stormwater  
Street/Alley Maintenance • Wastewater Collection  
Water Distribution • Wastewater/Water Treatment*

### Engineering

*Construction • Development  
Property Management • Traffic*



## CITY OF EUREKA

Another item that we understand is not in the Study scope pertains to the City's current goal of creating a more formal "entrance" to the City from the south. Any proposed plan for these improvements could possibly affect a recommended traffic safety and operational improvement project proposed by the State. It would be advantageous if the Study recognized the potential improvements and perhaps included a procedure for incorporating potential improvements into the Study report.

Thank you for the opportunity to comment on the Broadway Feasibility Study. We look forward to continued collaboration on this important safety and congestion improvement project. Feel free to contact me with any follow up comments or questions.

Sincerely,

Charles Roecklein, P.E.  
City Engineer

Attachment, list of known projects on Broadway

Cc: Rex Jackman, System and Community Planning Chief  
Troy Arseneau, Office of Traffic Operations Chief  
David Morgan, Traffic Safety Chief  
Mike Knight, Interim City Manager  
Sheila Parrott, Traffic Division Project Manager

**ATTACHMENT TO COMMENTS LETTER ON BROADWAY FEASIBILITY STUDY**

**March 28, 2014**

**The following list of known, proposed projects in the vicinity of Broadway do not have determined construction dates and are in various stages of permitting.**

1. Redwood Marine Project      14<sup>th</sup> & Broadway      Boat sales – approximately 24,000 SF
  
2. South Gateway Project      Herrick to Pierson's      South Entrance Beautification to City
  
3. County Building H      W. Clark      Government office – expansion (27,000 SF) of existing Humboldt County Children & Family Services Center
  
4. Oil Stop      W. Clark & Broadway      Oil Change Business

# Appendix B

## Computer Modeling

2014

# GEA Model Development

## Model Update Documentation

Explanation behind the recent update to the microsimulation model originally created by Caliper Corporation in 2009.



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## GEA MODEL DEVELOPMENT DOCUMENTATION

### PURPOSE

Update the 2009 GEA Microsimulation Model.

### NEED

Discrepancies were noted about the model, which would require an update of the existing microsimulation model. These included insubstantial turning movements at signalized intersections, extreme queuing, and misplaced employment.

### REASONING

The original GEA Microsimulation model created by Caliper Corporation in 2009 was being used for the Broadway Feasibility Study (BFS). Much analysis had gone into the model development including:

- Signal timing
- Network Editing
- Building the desired scenarios
- Reasonableness checking

There was some unrealistic turning movement behavior noticed at the signals along Broadway. To fix the problem, South Broadway was examined at the signalized intersection at Kmart. Too few vehicles were entering and exiting the corresponding centroid. When studied with a more detailed eye it was found that the employment information for Kmart was designated to the wrong Traffic Analysis Zone (TAZ) causing vehicles to enter/exit at the wrong place. To resolve this issue it was necessary to return to the travel demand model (TDM) that generated the microsimulation model.

The Greater Eureka Area Travel Model (GEATM) formed the basis for the microsimulation. It had very recently been updated by a consultant, LSA/Cambridge Systematics, to the Humboldt County Travel Demand Model (HCTDM). Because there was a more recent and more up-to-date version of a TDM to work from, it was decided to use the HCTDM as a base for the microsimulation model instead of the GEATM. The same problem persisted in the new version of the TDM. Kmart and other companies were placed in the wrong TAZ. To fix this, the Access database, an input to the TDM, was corrected to reflect what is currently out in the field. This included adding retail employment to the Kmart TAZ and removing it from the wrong location. Furthermore, the retail employment numbers between the Bayshore Mall and Big 5 TAZs were switched. Once the land use data had been adjusted the TDM had to be run again to get new network volumes. After the TDM was deemed acceptable, a subarea analysis was conducted in order to export the OD matrix, centroids and centroid connectors for use as input to the microsimulation model.

The original GEA Microsimulation network was held intact as other elements of the model were imported. Additional centroid connectors were added to the network to create a more realistic distribution of where the vehicles would enter the network. The TDM only contains one to two centroid connectors per centroid because it operates on a broader scale. In terms of the microsimulation, more detailed information is required because so few centroid connectors in the microsimulation model would cause unreasonable queuing and delay. Since the TDM operated as a model for 2010 and the microsimulation was being tested for the horizon year of 2020 a ten year blanket growth factor was applied to the OD Matrix. The growth factor was obtained using Caltrans 2006 Growth Factor Memo\* (see Appendix A). For the greater Eureka area the 2020 year straight-line growth factor is 1.3 (30%), deducing that a ten year growth factor would equate to 1.15 (15%).

\*Caltrans' Office of System Planning recently (Feb. 2014) updated the growth factors on District 1's system; the blanket growth factor in the model will need to be changed next time the model is updated.

## PEDESTRIANS AND BICYCLES

Non-motorized users are incorporated into the model.

Some pedestrian counts were taken during the original creation of the microsimulation, but these were recently updated to include pedestrian counts taken with the Office of Traffic Safety's Miovision cameras on Broadway, 4<sup>th</sup>, and 5<sup>th</sup> Streets. Even though Miovision is an advantageous method of completing counts, the Miovision automated count system may misinterpret shadows as pedestrians, causing an unrealistic count for pedestrian movements at the intersection, these counts may need to be confirmed if a study is done on 4<sup>th</sup> and 5<sup>th</sup> Streets. Pedestrian timings were incorporated into the signal timings and at times surpassed the max green time, causing the signal to operate at max green instead of pedestrian timing. For crossings at unsignalized intersections pedestrians can cross at random and the oncoming vehicles will yield. The microsimulation software provides an option to set up a HAWK system, thought since no HAWK systems exist on the roadway now they were not included.

Bicycles can be included in the vehicle fleet mix, but were not because they were not included in the original model. Bicycles are taken into consideration in the signal timings; the minimum green is increased from 5 to 12 seconds to account for the slower moving non-motorized traffic. Bike lanes were added to Broadway but bicycles themselves are not visible in the simulation, because there are no bicycles in the fleet mix.

## ANALYSIS

The simulation was determined to be realistic by running dynamic traffic assignments (DTA). Initial work on the BFS determined that to create output, 25 runs would be averaged. TransModeler uses Highway Capacity Manual (HCM) analysis methods to conduct intersection and segment level of service (LOS) analysis. A series of eight model runs were analyzed in the updated version of the BFS (see attachment). The previous model iterations were performed on the now older version of the GEA Microsimulation

Model; therefore we cannot accurately compare the results from those runs to the corrected version. Both sets of model scenarios were determined by Advanced Planning engineers and performed by System Planning modelers.

The Emissions output was conducted partially outside of TransModeler. The integral piece in Emissions modeling is the vehicle fleet mix which for this model was obtained from Jerome Carman of Redwood Coast Energy Authority who collected data from the DMV for Humboldt County and combined it with the default parameters in the EMFAC for big trucks. The EMFAC and CMEM vehicle fleets have different mixes. The EMFAC is more readily used with TDM output, where the CMEM is utilized when microsimulation model output is available. Passenger cars are split into 20 categories in the microsimulation output. Since the EMFAC only has two categories of passenger cars, the percentage for EMFAC was evenly split between all types. A study from Long Beach was used as a template for the CMEM fleet distribution. The study had a demand percentage for each vehicle type and those were used as a base ratio to compute the corresponding fleet mix for the greater Eureka area (Appendix B).

## ASSUMPTIONS

- **Emissions** – The Eureka vehicle fleet mix distribution was assumed to correlate between the EMFAC and CMEM models, except that large trucks would on make up 5% of the fleet mix.
- **Growth Factor** – A blanket ten year growth factor of 1.15 (15%) was applied to the microsimulation's Origin-Destination (OD) matrix.
- **Global Turning Delay** – With no intervention, vehicles travel through the City of Eureka rather than taking Broadway for through trips. Turning penalties were added to keep through vehicles on Broadway.
- **Signal Timing** – It was assumed that the signal timing would not change that much over the next ten years, so today's timings were used for the future model scenarios.

## SOURCES OF ERROR

- Inaccurate/misplaced land use in the TDM model
- Incomplete knowledge of the TDM and microsimulation models
- DTAs not meeting specified relative gap of 0.003
- Estimated signal timings for new and adjusted signals along Broadway
- PM traffic demand adjustment in the TDM
- Blanket Growth Factor – is not accurate to say a TAZ will grow if it's already built out
- Pedestrians counts, if Miovision counts are not reliable
- Some vehicles not making it to their final destination when loading into network at Bayside
- Vehicle Fleet Mix, too many large trucks slowing down the network
- Model Build, TransModeler is still a developing software and consistently has updates that affect the output

## FINDINGS

## Broadway Feasibility Study:

From an operational stand point, Scenarios 3, 6, and 7 performed the best. For complete details see Appendix C.

## FUTURE ENHANCEMENTS AND MAINTENANCE

Once a maintenance contract is established with Sean McAtee of Cambridge Systematics for the TDM, and the areas of concern within the TDM recognized by the GEA Modeling User's Group are adjusted, the microsimulation will again need to be updated. There will need to be a subarea analysis which will feed the OD Matrix, centroid and centroid connectors into the microsimulation model. Growth factors will require updating and maintenance in the microsimulation as the growth factors are updated in System Planning.

After spending much time with the microsimulation model, I find that it can always be improved upon and below are some of the ways to do so:

- Improved vehicle fleet mix
- Extend left turn pockets as needed
- Shorten nodes (i.e. Spring & Wabash)
- Remove/add centroid connectors as needed for realistic points of entry/exit
- Adjust driver behavior decision time
- Add centroid connectors for Bayside/Indianola/Myrtle – reduce queuing issue by adding actual travel time:
  - Myrtle to Indianola 6 min
  - Myrtle to Bayside 9 min
  - 101 N to Bayside 8 min
  - 101 N to Indianola 11 min
  - Indianola to Bayside 5 min
- Pedestrian data and crosswalk inventory
- ETS schedule, paths, and stops
- Optimize signal timing for future years (Synchro)

## GLOSSARY

Centroid – corresponds to a specific TAZ and its employment and household data, and they serve as the origins and destinations of trips

Traffic Analysis Zone – a geographical area, various in size, constructed by census block information with socio-economic attributes

Centroid Connectors – carry vehicles into and out of the network from centroids to links in the network

OD Matrix – a matrix of all the centroids, giving each cell a value of how many vehicles travel between that origin and destination

Appendix C  
Public Meeting  
Attendee Lists

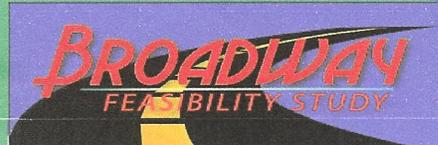
# US 101 FEASIBILITY STUDY

BUSINESS STAKEHOLDER MEETING - FEB 8, 2012

## Sign-In Sheet

7/2012

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# US 101 FEASIBILITY STUDY

BUSINESS STAKEHOLDER MEETING - FEB 8, 2012

## Sign-In Sheet

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# US 101 FEASIBILITY STUDY

PUBLIC MEETING - FEB. 16, 2012

## Sign-In Sheet

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# US 101 FEASIBILITY STUDY

PUBLIC MEETING - FEB. 16, 2012

## Sign-In Sheet

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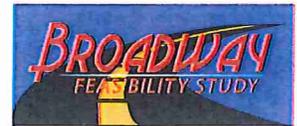




# Broadway Feasibility Study

February 27, 2014

## Sign In Sheet



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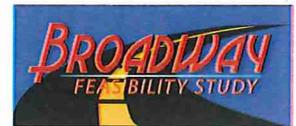
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# Broadway Feasibility Study

February 27, 2014

## Sign In Sheet



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Paul [unclear]	BT Metal	707-443-0934
Mindi [unclear]	BT Metal	"
MINNIEWOLF	—	445-3501

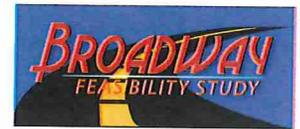
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# Broadway Feasibility Study

February 27, 2014

## Sign In Sheet



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Russ Birba	DON'S RENT-ALL	5 5 C
DAN MOODY	CITY OF EUREKA	_____
NICK ARMAN	Motel 6	_____
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Pam Lomban	H CAR	

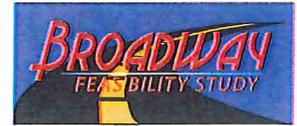
**NOTICE:**

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# Broadway Feasibility Study

February 27, 2014

## Sign In Sheet



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Appendix D

References

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Appendix E  
Scenario Improvement Maps

# SCENARIOS 1 AND 2



## All Scenarios

- No parking (Kmart to Wabash St)
- Bike lanes (Kmart to Wabash St)
- Protected left turns (Wabash & 14th St)
- Traffic signal coordination
- Close northbound Fairfield Ave

## Scenario 1.0

- Traffic signal at Hawthorne St
- Traffic signal at Clark St
- Raised median 12' wide with openings at signalized intersections (McCullens St to 4th/5th St)
- Raised median 2.5' wide (Cedar to 5th St)
- Left turns restricted during peak hours (Clark St & Washington St)
- Bike lanes (Cedar to 4th/5th St)

## Scenario 2.0

- Turn restrictions at Hawthorne St
- Raised median 12' wide with openings at signalized intersections (McCullens St to Cedar St)
- Raised median 2.5' wide (Cedar to 5th St)
- Left turns restricted during peak hours (Clark St & Washington St)
- Bike lanes (Cedar to 4th/5th St)





**Traffic Signal**



**Northbound Leg of  
Fairfield Closed**

**Traffic Signal**

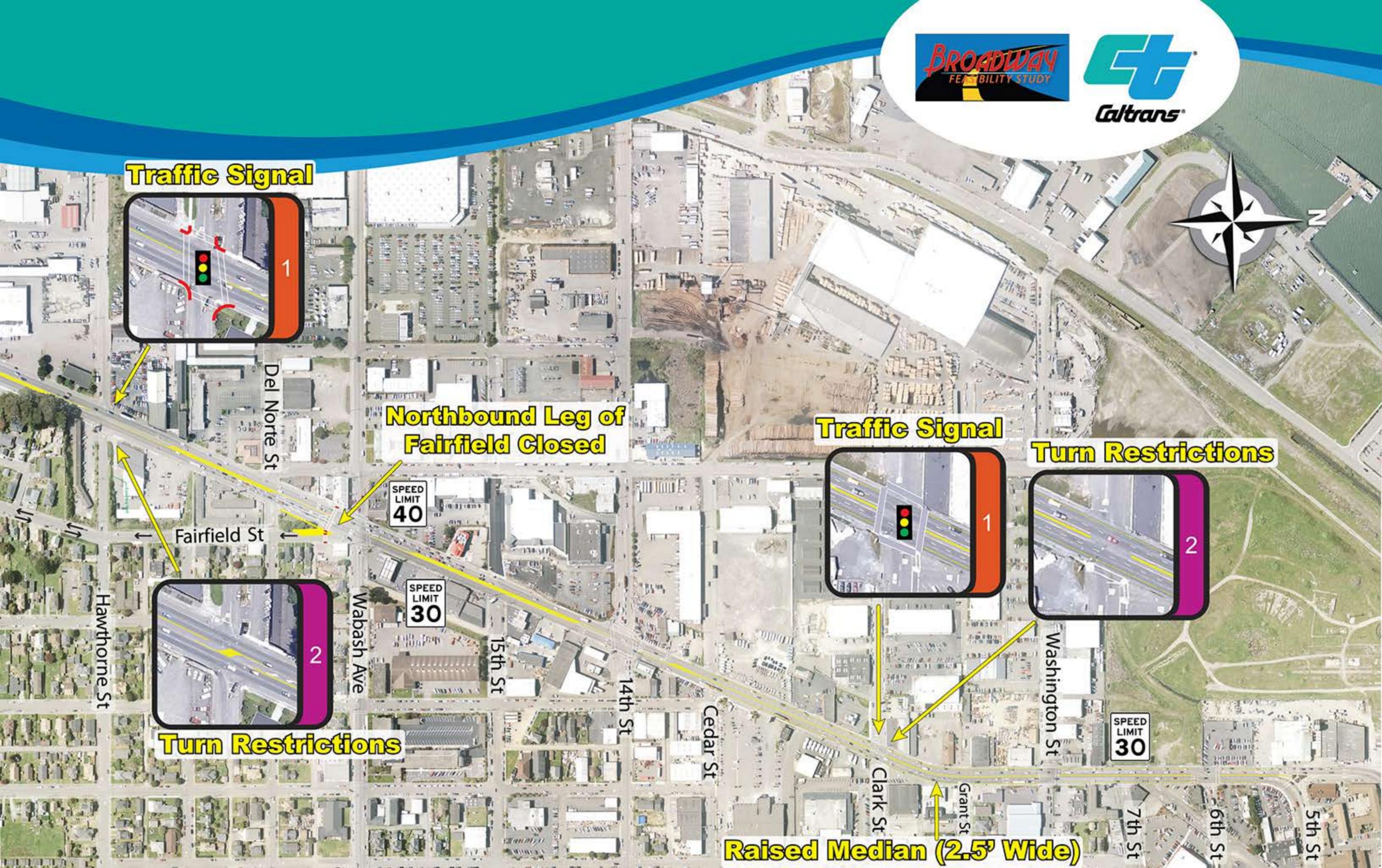


**Turn Restrictions**

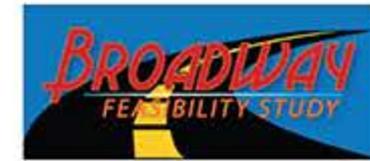


**Turn Restrictions**

**Raised Median (2.5' Wide)**



# SCENARIOS 3 THROUGH 6



SPEED LIMIT 40

SPEED LIMIT 45

SPEED LIMIT 40

**Raised Median (12' Wide)**

Fort Humboldt

Lost Coast Brewery Site

Kmart

Sunset Dr

Allard Ave

McCullens Ave

Tomlinson St

Truesdale St

Highland Ave

## All Scenarios

- No parking (Kmart to Wabash St)
- Bike lanes (Kmart to Wabash St)
- Protected left turns (Wabash & 14th St)
- Traffic signal coordination
- Close northbound Fairfield Ave

## Scenario 3.0

- Traffic signal at Hawthorne St
- Raised median 12' wide with midblock & signalized intersection openings (McCullens St to 4th/5th St)

## Scenario 4.0

- Traffic signal at Hawthorne St
- Add dedicated right turn on Henderson St
- Raised median 12' wide with midblock & signalized intersection openings (McCullens St to 4th/5th St)

## Scenario 5.0

- Turn restrictions at Hawthorne St
- Raised median 12' wide with midblock & signalized intersection openings (McCullens St to 4th/5th St)

## Scenario 6.0

- Turn restrictions at Hawthorne St
- Add dedicated right turn on Henderson St
- Raised median 12' wide with midblock & signalized intersection openings (McCullens St to 4th/5th St)





**Traffic Signal**



**Northbound Leg of  
Fairfield Closed**

Fairfield St

Del Norte St

Wabash Ave

SPEED  
LIMIT  
40

SPEED  
LIMIT  
30

15th St

14th St

Koster Ave

Washington St

SPEED  
LIMIT  
30

**Turn Restrictions**



Hawthorne St

Cedar St

Clark St

Grant St

7th St

6th St

5th St