Chapter 2 - Project Alternatives

2.1 Project Description

This section describes the proposed action and the design alternatives that were developed by a multi-disciplinary team to achieve the project purpose and need while avoiding or minimizing environmental impacts. The project is designed in Metric units. The Final EIR/EIS provides a hard conversion to English units within the text. During final design, each segment would be converted to English units using the most recent design standards. Any impacts associated with this conversion will be assessed before listing any segment for construction. The design alternatives were identified in the MIS that was conducted through the North Coast Transportation Study and refined with input from the PDT, the NEPA/404 MOU integration process, and public scoping information. This included the goal to provide the full range of transportation modal alternatives that are cost-effective, promote and provide incentives for ridesharing and alternative modes, accommodate regional and interregional freight movements, and minimize environmental and community impacts. These alternatives were discussed and subsequently eliminated or identified for further consideration in the PSR (Project Development Support) (PSR [PDS]) dated January 2000.

The proposed *I-5 NCC Project* would improve the existing I-5 freeway. The project begins at La Jolla Village Drive in San Diego and extends northward approximately 27 mi to Harbor Drive in Oceanside. The main purpose is to maintain or improve the existing and future traffic operations in the I-5 North Coast Corridor in order to improve the safe and efficient regional movement of people and goods for the planning design year. As of May 2013, the estimated cost for the project, depending on the alternative, ranges between $3.1 billion and $4.5 billion, which includes right-of-way and utility relocation costs of between $235 million and $423 million and construction costs between $2.1 billion and $3.4 billion. Funding for the project comes from the State Transportation Improvement Program (STIP) – Regional Improvement Program (RIP) for Capital Outlay, as well as the TransNet Program, a voter-approved half-cent sales tax to support regional transportation projects in San Diego County

Most of I-5 within the project area was originally built in the mid-1960s to the early 1970s as an eight-lane mixed-use freeway, which it remains. Local interchanges within the project area exist within the Cities of San Diego, Solana Beach, Encinitas, Carlsbad, Oceanside, and within Camp Pendleton. Freeway-to-freeway interchanges within the project area exist at I-5 / I-805, I-5 / SR-56, I-5 / SR-78, and I-5 / SR-76. Recent major improvements have been made, such as widening at the I-5 / I-805 merge area, adding HOV lanes between Genesee Avenue and Via de la Valle, adding direct connector ramps (westbound SR-56 to southbound I-5) at the I-5 / SR-56 freeway-to-freeway interchange, and other improvements. Construction to reconfigure the interchange at Lomas Santa Fe Drive and extend the existing HOV lanes north to the Manchester Overcrossing and San Elijo River Bridge was completed in the fall of 2008.

The project alternatives were assessed for their ability to meet the objectives of the purpose and need established for the project, with consideration to avoid and/or minimize impacts on the environment, local streets, and communities adjacent to the project, while adhering to Caltrans design and safety standards. The alternatives eliminated from further consideration are discussed in *Section 2.5, Alternatives Considered but Eliminated from Further Discussion.* The five alternatives under consideration for this project are: “10+4 Barrier” (a total of 10 main lanes with 4 HOV/Managed Lanes contained in the median with barrier); “10+4 Buffer” (a total of

10 main lanes with 4 HOV/Managed Lanes contained in the median with a painted stripe separation instead of a barrier); ”8+4 Buffer” (a total of 8 main lanes with 4 HOV/Managed Lanes contained in the median with a painted stripe separation); “8+4 Barrier” (a total of 8 main lanes with 4 HOV/Managed Lanes contained in the median with barrier instead of painted stripe buffers); and the “No Build” alternative. The four build alternatives are similar to each other south of Del Mar Heights Road and north of SR-78.

2.2 Alternatives

2.2.1 Build Alternatives

A range of alternatives was developed to meet the purpose and need of the project. The build alternatives included and shown in the schematic figures are: 10+4 Barrier, 10+4 Buffer, 8+4 Barrier, and 8+4 Buffer (*Figures 2-2.1a* through *2-2.1d*, respectively, at the end of this chapter*)*. These alternatives are described below and detailed layouts for all four build alternatives are contained in the DPR. Typical cross-sections for the build alternatives are provided on *Figures 2-2.2a* through *2-2.2e* and are located at the end of this chapter for each alternative. A list of non-standard design features is provided in Appendix I, Non-standard Features, of this Final EIR/EIS.

Following circulation of the Draft EIR/EIS and receipt of comments, the 8+4 Buffer alternative, the smallest of the build alternatives, was refined. The refined 8+4 Buffer alternative was determined to be the locally preferred alternative (LPA) in 2011 and was addressed in the August 2012 Supplemental Draft EIR/EIS. Following completion of Clean Water Act Section 404(b)(1) analysis to ensure that the 8+4 Buffer alternative is in fact the Least Environmentally Damaging Practicable Alternative (LEDPA), the refined 8+4 Buffer alternative is now also identified as the Preferred Alternative. For ease of continuity between this Final EIR/EIS and the Draft EIR/EIS, the Preferred Alternative continues to be addressed through the analysis as the refined 8+4 Buffer alternative.

The Preferred Alternative is presented on *Figures 2-2.3, Sheets 1* through *67,* at the end of this chapter. These project feature maps schematically depict lanes (including existing general purpose lanes, and proposed HOV/Managed Lanes and auxiliary lanes), DARs, bridge locations and I-5 over- and undercrossings, as well as best management practices ([BMPs] e.g., bioswales). They also depict preliminarily reasonable and feasible soundwalls and sensitive receptor measurement locations, as well as locations for short-term (ST) and long-term (LT) measurements. The Project Features Maps shown in the Draft EIR/EIS are now included in Appendix K, Reference Graphics from the Draft EIR/EIS, for ease of reference. Schematics of proposed I-5 configuration are depicted on *Figures 2-2.8a* through *c*, also at the end of this chapter.

Preferred Alternative

8+4 Buffer Alternative (Figures 2-2.1d, 2-2.2b, *2-2.2d,* and *2-2.2e)*
The 8+4 Buffer alternative would construct four HOV/Managed Lanes, two in each direction, and would separate HOV/Managed Lanes from general purpose lanes with a five-ft and variable width buffer instead of a barrier. Each of the design elements described in *Section 2.2.2, Common Design Features of the Build Alternatives*, would also be implemented. Identified as

the LPA in the Supplemental Draft EIR/EIS, refinements to the project since circulation of the Draft EIR/EIS are detailed in this Final EIR/EIS and summarized below.

- Reduction in right-of-way requirements
- Revisions to lagoon bridges and channel improvements
- Elimination of DARs at Cannon Road and Oceanside Boulevard
- Refinement of the Manchester Avenue DAR to eliminate a flyover, implement an undercrossing and reduce the amount of parking at the San Elijo Multi-use Facility
- Addition of the I-5 North Coast (NC) Bike Trail
- Addition of California Highway Patrol cross-over/turn facilities

The refined 8+4 Buffer alternative (Preferred Alternative) configuration is depicted on *Figures 2-2.3, Sheets 1* through *67,* at the end of this chapter.

Other Build Alternatives

10+4 Barrier Alternative (Figures 2-2.1a, 2-2.2a, and *2-2.2c)*

The 10+4 Barrier alternative would construct four HOV/Managed Lanes, two in each direction, and add one general purpose lane in each direction. In addition to the features described in *Section 2.2.2*, the HOV/Managed Lanes would be separated from general purpose lanes with a barrier using standard shoulder widths of 10 ft, which would be provided on either side of the barrier from Del Mar Heights Road to SR-78. The general purpose lane would be constructed in each direction on I-5 from just south of Del Mar Heights Road to SR-78.

10+4 Buffer Alternative (Figures 2-2.1b, 2-2.2a, and *2-2.2c)*

The 10+4 Buffer alternative would construct four HOV/Managed Lanes, two in each direction, and add one general purpose lane in each direction. In addition to the following project description, the 10+4 Buffer alternative would function similarly to the 10+4 Barrier alternative but would separate HOV/Managed Lanes from general purpose lanes with a five-ft and variable width buffer instead of the barrier.

8+4 Barrier Alternative (Figures 2-2.1c, *2-2.2b,* and *2-2.2d)*

The 8+4 Barrier alternative would construct four HOV/Managed Lanes, two in each direction and would function similarly to the 8+4 Buffer alternative. In addition to the following project description, the HOV/Managed Lanes would be separated from general purpose lanes with a barrier using standard shoulder widths of 10 ft, which would be provided on either side of the barrier from Del Mar Heights Road to SR-78.

2.2.2 Common Design Features of the Build Alternatives

All the build alternatives share a number of common features, which are identified below. Proposed improvements for this project are the same from the beginning of the project near La Jolla Village Drive to Del Mar Heights Road, and from SR-78 to the end of the project near Harbor Drive, with HOV/Managed Lanes separated from the general purpose lanes by a varying buffer up to five ft wide. In general the project would:

- Separate HOV/Managed Lanes from general purpose lanes from near La Jolla Village Drive to Del Mar Heights Road, and from SR-78 to near Harbor Drive/Vandegrift Boulevard by a buffer varying in width up to five ft

- Construct one HOV/Managed Lane in each direction from La Jolla Village Drive (north of) to just north of Lomas Santa Fe Drive
- Provide a continuous HOV lane through the I-5 / I-805 junction with a freeway-to-freeway connector (flyover)[1] crossing over the I-5 / I-805 merge and connecting the proposed HOV/Managed Lanes to the existing HOV lanes just north of that merge
- Construct two HOV/Managed Lanes in each direction from just north of Lomas Santa Fe Drive to Harbor Drive/Vandegrift Boulevard
- Construct DARs from grade-separated interchanges into Managed Lanes, thereby allowing direct access to the HOV/Managed Lanes without weaving across general purpose lanes, at Voigt Drive and Manchester Avenue. The DARs are compatible with carpools, bus transit, and value pricing and would support HOV/Managed Lanes. The proposed DAR at Manchester Avenue has been redesigned since circulation of the Draft EIR/EIS to minimize environmental impacts. Voigt Drive and Campus Point Drive would be modified to accommodate the proposed Voigt DAR traffic by bisecting an existing parking lot and providing adequate parking on either side, which would not preclude proposed light rail transit
- Construct Intermediate Access Points (IAPs), or at-grade access, near Carmel Mountain Road, between Del Mar Heights Road-Via de la Valle, Lomas Santa Fe Drive, Santa Fe Drive, Poinsettia Lane, Tamarack Avenue, and Oceanside Boulevard; and access points at the ends of HOV/Managed Lanes at La Jolla Village Drive and Harbor Drive
- Provide Intelligent Transportation System (ITS) components, such as toll collection equipment, to allow Single Occupancy Vehicle (SOV) users to purchase use of HOV/Managed Lanes (including overhead suspended scanner devices such as gantries, traffic monitoring stations, ramp meters, closed circuit television [CCTV] to view traffic on the facility and to help manage the traffic, changeable message signs [CMSs] to display the tolls, and loop detectors to measure traffic volume and speed)
- Construct 12-ft-wide auxiliary lanes as needed in 19 locations (including 6 southbound, 5 northbound and 8 both north- and southbound), and 10- to 12-ft-wide shoulders
- Construct a new park and ride facility at SR-76, a new multi-use facility at Manchester Avenue, and enhanced park and ride facilities at other locations
- Revise various local interchanges to improve vehicular, pedestrian, and bicycle circulation at the following locations: northbound ramp for California Street; southbound ramps for Cassidy Street; and both north- and southbound ramps for La Jolla Village Drive, Genesee Avenue, Roselle Street, Carmel Valley Road, Del Mar Heights Road, Via de la Valle, Lomas Santa Fe Drive, Manchester Avenue, Birmingham Drive, Santa Fe Drive, Encinitas Boulevard, Leucadia Boulevard, La Costa Avenue, Poinsettia Lane, Palomar Airport Road, Cannon Road, Tamarack Avenue, Carlsbad Village Drive, Las Flores Drive, SR-78, Oceanside Boulevard, Mission Avenue, SR-76, and Harbor Drive
- Revise local street and highway crossings where new bridges are proposed to improve sidewalks, lighting, landscaping, and enhanced retaining walls
- Provide new and/or wider bridges at Soledad Canyon Creek, Los Peñasquitos Creek, Carmel Creek, Loma Alta Creek, San Dieguito River, San Luis Rey River, and Sorrento Valley; and at San Dieguito, San Elijo, Batiquitos, Agua Hedionda, and Buena Vista Lagoons, with the San Elijo, Batiquitos, and Buena Vista bridges also to be lengthened
- Provide improvements to storm water facilities at Encinas Creek
- Include interpretative elements in an overlook area for the San Elijo Lagoon

[1] The HOV freeway-to-freeway connector would consist of two bridges connected in the center by a portion of roadway embankment that would lie on an embankment outside of the Soledad Canyon and Los Peñasquitos creeks.

- Construct retaining walls (to reduce property acquisition needs, stabilize slopes, minimize impacts, and accommodate engineered structures), barriers, guard rails/end treatments, crash cushions, bridge rails, and signage at specific locations, and as needed, along the I-5 corridor
- Abandon or improve project-related drainage facilities, including extensions, replacements or linings, with new drainage facilities constructed adjacent to cross roads (facility examples include storm drain inlets, storm ditches, rock slope protection, and headwalls)
- Install ramp metering at various on-ramps (with ultimate metering at all 58 on-ramps at buildout)
- Relocate various existing overhead or underground utilities (water, sewer, gas, electric, telephone, and other communications) as needed and within existing utility easements, as possible
- Construct proposed soundwalls as described in *Section 3.15, Noise*, of this document, with specifics dependent on final design
- Construct a regional gateway feature at Harbor Drive in Oceanside
- Construct regional and community enhancement features

In compliance with the Americans with Disabilities Act (ADA) of 1990 (42 U.S.C. §12101 et seq. and 47 U.S.C. §225, Pub. L. 101–336, July 26, 1990, 104 Stat. 327, as amended by the ADA Amendments Act of 2008, Pub. L. 110–325, September 25, 2008), Caltrans has been improving the pedestrian infrastructure through highway construction, bridge replacement, and safety roadside rest rehabilitation projects. In addition, all the build alternatives would provide infrastructure equally accessible to persons with disabilities.

As noted in *Section 2.2.1*, *Build Alternatives*, the separation between the HOV/Managed Lanes and the general purpose lanes would be provided by a barrier or buffer. The barrier-separated lanes would provide a physical barrier from the mainline lanes by a concrete barrier, while buffer-separated lanes would use painted stripes between the general purpose lanes. The concrete barriers require emergency shoulder areas on each side of the barrier and would have a larger project area. The painted buffer separation would require less project area.

Placement of common design features with overhead elements such as highway signs, ITS components, etc., would be determined during final design. Where these features would be in the vicinity of lagoons, placement would be designed in coordination with the CCC and wildlife agencies.

ITS components consist of a broad range of diverse technologies such as information processing, communications, control, and electronics that can help transportation systems in many ways, including congestion management. Specific equipment would be required for the implementation of the Value Pricing Program to ensure that motorists could easily use the proposed HOV/Managed Lanes, in addition to the existing intersection traffic signals, loop detectors, ramp meters, CMSs, and CCTV. The technology components to manage traffic for related operations and enforcement include HOV/Managed Lane-related overhead suspended scanner devices (such as gantries), traffic monitoring stations, ramp meters, CCTV, and other ITS components outlined in the Value Pricing Study. Additional equipment includes CMSs to display the tolls, loop detectors to measure traffic volume and speed, and CCTV to view traffic on the facility and to help manage the traffic.

Taken together, the above common design elements of the *I-5 NCC Project* are expected to provide the following benefits:

- An HOV/Managed Lane trip through the entire corridor is projected to be up to 17 minutes faster in the afternoon peak period than a trip on the general purpose lanes when the HOV/Managed Lanes are in place.

- Because the toll for SOVs increases as traffic volumes on the HOV/Managed Lanes increase, those lanes are managed to guarantee free-flow travel for HOVs, resulting in predictable and reliable travel for trips.

- At capacity, an HOV/Managed Lane is expected to carry nearly 3,400 people per hour during peak periods, compared with approximately 2,560 people per hour in a general purpose lane, providing an efficient approach to moving people rather than cars.

- Free-flow lanes are essential to the success of transit services like Bus Rapid Transit (BRT) and highway express buses. HOV/Managed Lanes on I-5 would provide the necessary facility for these future mass transit modes.

- Toll revenue from SOV users of the HOV/Managed Lanes could provide millions of dollars annually toward the support of transit services and other transportation improvements in the corridor.

- The ability to manage the use and vehicle composition of HOV/Managed Lanes provides great flexibility for changing the way they are used in the future. Changes could respond to shifts in technology, land use, travel patterns, travel demand, economic conditions, and other travel characteristics; changes could include requiring higher vehicle occupancy and greater use of transit, or creating a truck route during certain times of day.

The remainder of this section discusses specifics of the primary design elements listed above.

Bridges

The proposed bridge lengths are recommended as a result of the lagoon bridge optimization studies and are included in the project as an enhancement to optimize the benefits of the lagoons (see discussion in *Chapter 3, Sections 3.9, Hydrology / Drainage (and Floodplains), and 3.17, Natural Communities)*. These modifications are detailed in *Section 3.17* on lagoon bridge options summary analyses tables prepared for each lagoon crossed by I-5. In summary, new bridges are now proposed at Agua Hedionda, San Elijo, Batiquitos, and Buena Vista Lagoons, with longer bridges proposed at the latter three lagoons. Refinements in bridge widths have been provided for the 8+4 Buffer alternative (and are shown on *Table 2.2.4* in the discussion of interchange/ramp reconfiguration and structure changes below). A comparison of existing and currently proposed bridge lengths for lagoon and related waterway crossings, regardless of alternative, is shown in *Table 2.2.1,* with examples of typical designs for high, low and over/undercrossing (OC/UC) bridges shown on *Figures 2-2.4a* through *2-2.4c*.

Table 2.2.1: I-5 Proposed Bridge Lengths (in feet)

Bridge Structures	Existing Length	Proposed Length
Los Peñasquitos Lagoon	--	--
Soledad Canyon Creek[1]	N/A[4]	863*
Los Peñasquitos Creek[1]	NA[4]	3376*
Carmel Creek[2]	421	421
Sorrento Valley[3]	NA[4]	443

Table 2.2.1 (cont.): I-5 Proposed Bridge Lengths (in feet)

Bridge Structures	Existing Length	Proposed Length
San Dieguito Lagoon	650	650
San Elijo Lagoon	340	560
Batiquitos Lagoon	219	282
Agua Hedionda Lagoon	191	191
Buena Vista Lagoon	102.4	197

[1] Flyover bridge; [2] Main I-5 bridge; [3] Bicycle bridge; [4] NA = There is no existing bridge at this location

* The HOV Connector consists of two bridges connected in the center by a portion of roadway that lies on an embankment outside of the creek. The flyover bridges directly above the Soledad Canyon Creek and Los Peñasquitos Creek, respectively, are noted above. The total length of the HOV Connector would approximately be 4459 ft, while the two bridges combined would approximately be 4239 ft.

Figure 2-2.4a: Bridge Typical: High Bridge

Figure 2-2.4b: Bridge Typical: Low Bridge

Figure 2-2.4c: Bridge Typicals: Overcrossing and Undercrossing

HOV/Managed Lane Intelligent Transportation Systems

The HOV/Managed Lanes ITS would reflect current plans, such as the Statewide Transportation Management System Standardization Plan, by incorporating ITS components for the general purpose and ramp lanes.

The HOV/Managed Lanes have two types of access control. The first of these are DARs from grade-separated interchanges into the Managed Lanes that allow direct access to the HOV/Managed Lanes without using the general purpose lanes. DARs improve freeway operations, reduce congestion, save time, promote use of alternative modes of transportation, and increase travel time reliability for both HOV/Managed Lane traffic and general purpose freeway traffic. The presence of HOV/Managed Lanes would support future BRT along I-5 HOV/Managed Lanes. By enabling HOVs (e.g., transit and carpools) and permitted SOVs to connect directly with the HOV/Managed Lanes, these vehicles avoid the need to weave across the general purpose lanes of traffic, thus improving freeway operations for all users. The DARs are compatible with carpools, bus transit, and value pricing. The general purpose traffic would not access the freeway at these locations. The two proposed DARs would be located at Voigt Drive and Manchester Avenue. A typical overhead (OH) DAR such as what would be implemented at Voigt Drive is schematically depicted on *Figure 2-2.5a*, with the currently proposed Manchester Avenue DAR undercrossing layout depicted on *Figure 2-2.5b*.

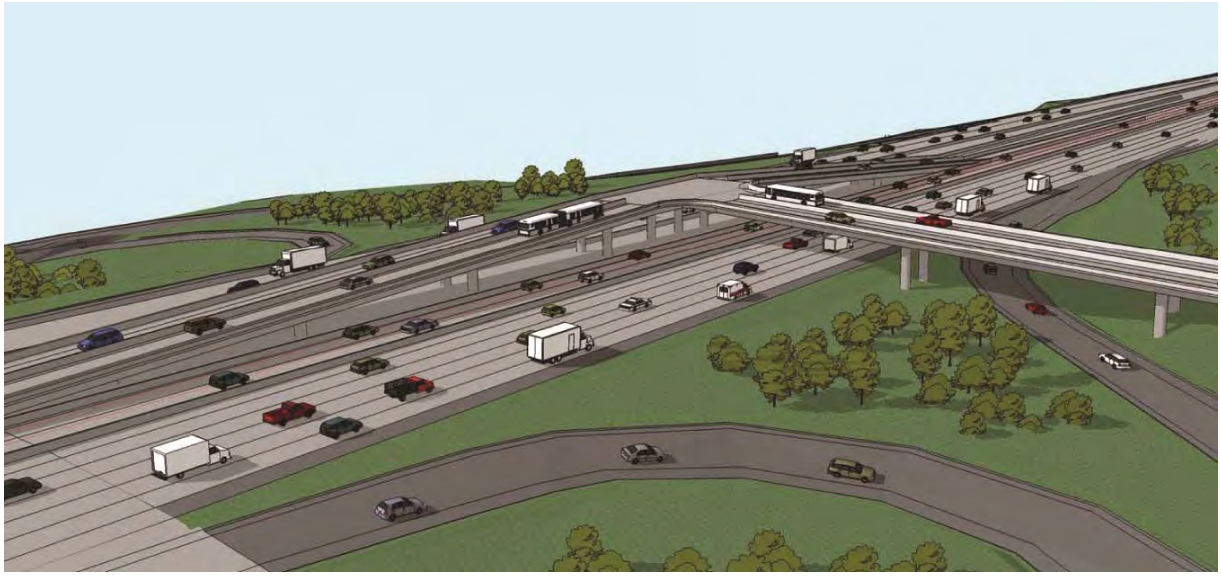


Figure 2-2.5a: **Typical Overhead DAR**

Figure 2-2.5b: Manchester Avenue DAR

The existing surface street geometry generally provides flexibility to accommodate potential improvements such as minor modifications, signing and striping reconfiguration, transit pre-emption, and the ability to increase storage capacity at turning lanes. On I-5, access points between the DARs and HOV/Managed Lanes appear to adequately handle merging and weaving operations. The DARs would eliminate the need for HOV/Managed Lanes users to weave across the general purpose lanes. These locations would also reduce traffic volumes at nearby interchanges, reducing delay.

Voigt Drive DAR

The existing Voigt Drive OC structure would be modified to facilitate the addition of north- and southbound DARs to the HOV/Managed Lanes from Voigt Drive. These DARs would consist of northbound and southbound off- and on-ramps to and from the I-5 median area. Cars would enter and exit the HOV/Managed Lanes from the lane closest to the median. Two DAR structure options were evaluated and the slimmer design was chosen. The Voigt Drive DAR would provide direct access to high density medical, university, and business centers near UCSD. As such, there is a high potential for multimodal connectivity (e.g., Mid-Coast Corridor Light Rail Transit [LRT] Project). This DAR is projected to be a high usage facility, with a forecasted ADT level of 14,900 vehicles by 2030 (equivalent to 2035).

The Voigt Drive DAR has been coordinated with the potential future Mid-Coast Corridor light rail. The DAR would allow for logical termini to HOV/Managed Lanes, reduce delay through the I-5 / Genesee Avenue Interchange, provide potential for multimodal connectivity, and provide access to the following:

- High HOV/Managed Lane target destinations east and west of I-5
- Hospitals and medical facilities (e.g., UCSD, Scripps, and Veterans Administration [VA] hospital)
- Employment centers east of I-5 (Qualcomm, Science Applications International Corporation [SAIC], etc.)
- Shopping
- Hotels

Manchester Avenue DAR

Two new UC structures would be constructed to accommodate north- and southbound DARs to the HOV/Managed Lanes from Manchester Avenue and the proposed San Elijo Multi-use Facility east of I-5. The DARs would consist of north- and southbound off- and on-ramps to and from the I-5 median area. The Manchester Avenue DAR location would provide access to coastal resources, a college, town centers, and a major arterial paralleling the freeway. The Manchester DAR is expected to have a high volume of traffic, with an ADT of approximately 6,400 vehicles by 2030 (equivalent to 2035).

The Manchester Avenue DAR would be located in an agricultural area adjacent to San Elijo Lagoon. Because of this, concerns were expressed during the Draft EIR/EIS public comment period regarding visual and coastal zone agricultural impacts related to the DAR design presented in the Draft EIR/EIS. The proposed DAR structure was chosen because it has a slimmer requirement area than a more open structure.

As noted, the DAR also would incorporate the proposed San Elijo Multi-use Facility. In addition to providing a parking location for commuters, it would provide a staging area for recreational users, and include bike lockers and solar electronic charging stations for electric vehicles, as well as enhanced water treatment. Combined with planned improvements to the Manchester Avenue UC, the multi-use facility would connect directly to Class II bike lanes extending in both directions along Manchester Avenue; providing access to the Coastal Rail Trail, the NC Bike Trail (see *Section 2.3, I-5 North Coast Regional and Community Enhancement Projects*), the California Coastal Trail, Cardiff State Beach, and San Elijo State Beach. The trails in and around San Elijo Lagoon, slated for expansion and enhancement as part of regional planning efforts, also would benefit from the additional parking and increased access provided by the

DAR and multi-use facility. New trails extending along the lagoon and under the highway bridges would be easily accessible from this location.

In summary, advantages of a DAR to and from Manchester Avenue include:

- Access to the proposed San Elijo Multi-use Facility
- Improved coastal access via connections to regional bike routes and pedestrian trails
- Access to Mira Costa College (San Elijo Campus)
- Access to Cardiff-by-the-Sea and Solana Beach Town Centers
- High HOV potential utilization on El Camino Real (serving eastern Encinitas)
- Support of future BRT

The other type of access to HOV/Managed lanes is via IAPs that occur at grade and adjacent to the freeway main lanes. These access points are similar to the existing access for HOV. Typical IAPs are shown on *Figures 2-2.6a* and *2-2.6b*. The proposed IAPs would be located near the following interchanges:

- Carmel Mountain Road
- Del Mar Heights Road-Via de la Valle
- Lomas Santa Fe Drive
- Santa Fe Drive
- Poinsettia Lane
- Tamarack Avenue
- Oceanside Boulevard

In addition, as previously noted, access points would also be provided at the ends of the HOV/Managed Lanes at La Jolla Village Drive and Harbor Drive.

Auxiliary Lanes

The project proposes auxiliary lanes at various areas within the corridor. Auxiliary lanes are defined in the Caltrans Highway Design Manual (HDM) as the portion of roadway used for weaving, truck climbing, speed change, or for other purposes supplementary to through traffic movement. The American Association of State Highway and Transportation Officials (AASHTO) additionally notes auxiliary lanes as the portion of the roadway adjoining the traveled way for speed change, turning, and storage for turning. In a freeway environment, auxiliary lanes may be provided downstream of an entrance ramp to accommodate merging traffic, upstream of an exit ramp to accommodate diverging traffic, or between two closely spaced interchanges to accommodate weaving traffic. They reduce turbulence in the traffic stream due to lane changing and changes in speed (including lower average speeds). In addition, auxiliary lanes may be carried through one or more interchanges to serve one or more of the listed purposes. In the North Coast Corridor, where access to local streets from I-5 (ramp volume) is high due to local trips using the freeway, the distances between interchanges are short, and freeway volumes are high, merging movements create greater levels of congestion. As such, 12-ft-wide auxiliary, acceleration, and deceleration lanes and shoulders up to 12-ft wide are planned for certain segments within the corridor.

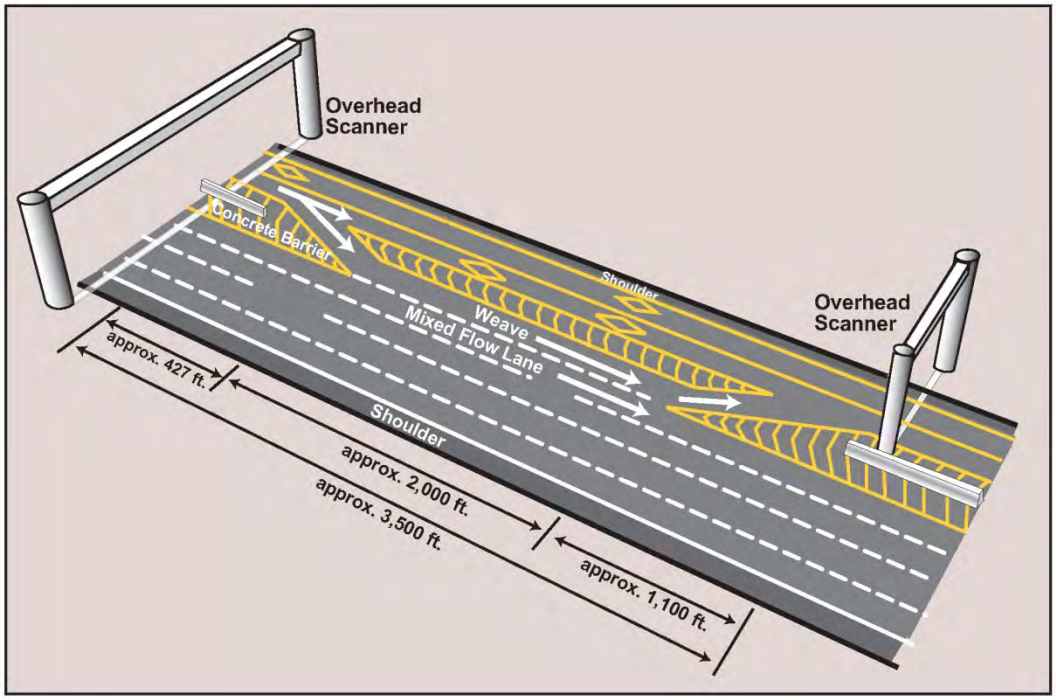


Figure 2-2.6a: Typical IAP Barrier

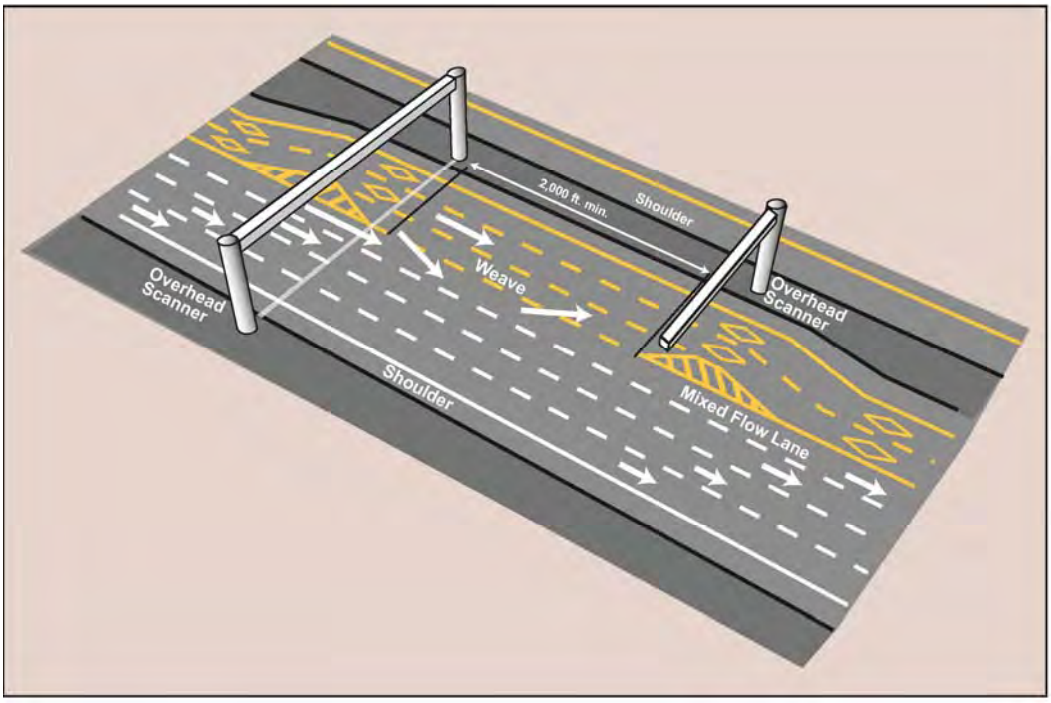


Figure 2-2.6b: Typical IAP Buffer

I-5 currently has, and will retain, auxiliary lanes in the following segments:

- Genesee Avenue to Sorrento Valley Road (Roselle Street) (northbound deceleration lane only)
- Genesee Avenue to northbound I-5 Bypass Lanes (northbound weaving lanes)
- Carmel Mountain Road to Carmel Valley Road (northbound weaving lane)
- Carmel Valley Road to Del Mar Heights Road
- Del Mar Heights Road to Via de la Valle (southbound weaving lane; northbound deceleration lane terminating at the Via de la Valle northbound off-ramp would be extended to begin at the Del Mar Heights Road northbound on-ramp)
- Via de la Valle to Lomas Santa Fe Drive
- Lomas Santa Fe Drive to Manchester Avenue
- La Costa Avenue to Poinsettia Lane (northbound deceleration lane; southbound acceleration lane)
- Palomar Airport Road to Cannon Road (northbound weaving lane; southbound acceleration lane beginning at the Cannon Road southbound on-ramp would be extended to terminate at the Palomar Airport Road southbound off-ramp)
- Cannon Road to Tamarack Avenue (northbound acceleration lane beginning at the Cannon Road northbound on-ramp would be extended to terminate at the Tamarack Avenue northbound off-ramp only)
- Carlsbad Village Drive to Las Flores Drive
- Las Flores Drive to Vista Way/SR-78
- Vista Way/SR-78 to Cassidy Street
- Cassidy Street to California Street (northbound only)
- California Street to Oceanside Boulevard (northbound only)
- Mission Avenue to SR-76 (southbound only)
- SR-76 to Harbor Drive

The auxiliary lanes described below would be constructed as part of the HOV/Managed Lanes project. Proposed new or extended auxiliary lane locations were determined in accordance with the Level of Service (LOS) D Method (weaving analysis) documented in HDM Index 504.7. Specifically, as further detailed in Section 7.1 of the I-5 North Coast Freeway Operations Report, LOS D weaving limits of 2,000 vphpl are specified for non-weaving main through lanes, and 1,800 vphpl are specified for weaving lanes. Each of the locations specified below is projected to exceed one of these limits in 2030 (consistent with design year 2035). These proposed auxiliary lanes would help to reduce congestion caused by traffic weaving between the begin and end points specified below, and would not, in and of themselves, require the addition of arterials that must cross the lagoons to meet the demand of the local trips. New or extended auxiliary lanes would be added in the following locations:

- La Jolla Village Drive to Genesee Avenue (northbound and southbound weaving lanes)
- Genesee Avenue to Roselle Street (southbound acceleration lane only)
- Del Mar Heights Road to Via de la Valle (extension of northbound only as stated above)
- Lomas Santa Fe Drive to Manchester Avenue (northbound acceleration lane)
- Manchester Avenue to Birmingham Drive (northbound and southbound weaving lanes)
- Birmingham Drive to Santa Fe Drive (northbound and southbound weaving lanes)
- Santa Fe Drive to Encinitas Boulevard (southbound weaving lane only)
- Encinitas Boulevard to Leucadia Boulevard (northbound weaving lane only)
- Leucadia Boulevard to La Costa Avenue (southbound acceleration lane only)
- Poinsettia Lane to Palomar Airport Road (northbound and southbound weaving lanes)

- Palomar Airport Road to Cannon Road (extension of southbound only as stated above)
- Cannon Road to Tamarack Avenue (extension of northbound only as stated above; southbound weaving lane)
- Carlsbad Village Drive to SR-78 (extension of southbound only)
- Las Flores Drive to SR-78 (northbound deceleration lane)
- SR-78 to Cassidy Street (southbound weaving lane; an existing southbound auxiliary/weaving lane would extend to the new southbound auxiliary/weaving lane that would begin at Oceanside Boulevard southbound on-ramp)
- Cassidy Street to Oceanside Boulevard (extension of northbound; southbound weaving)
- Oceanside Boulevard to Mission Avenue (northbound and southbound weaving lanes)
- Mission Avenue to SR-76 (northbound weaving only)
- SR-76 to Harbor Drive (northbound deceleration lane, extension southbound)

Interchange/Ramp Reconfiguration and Structure Changes

Ramp realignments would be required at several locations to accommodate the additional widening of the proposed project. Some interchanges would have additional improvements as noted in *Table 2.2.2.* Specific structure replacements and widening are listed on *Table 2.2.3*. *Table 2.2.4* identifies specific I-5 bridge widths for the refined 8+4 Buffer alternative.

Ramp Meters

There are a total of 58 freeway on-ramps along the I-5 corridor within the project limits and 23 of the freeway on-ramps are metered. Ramp meter delay values for most of the existing metered ramps are less than five minutes. In the year 2030 (consistent with design year 2035) build scenarios, all the freeway on-ramps would be metered.

Utility Relocations

Utility relocations would be required at several locations where overhead and underground facilities convey water, sewer, gas, electricity telephone, and other communications. Specifics are addressed in *Section 3.16, Energy,* of this document and Appendix J. These relocations would occur within existing utility easements wherever possible.

Several electrical facilities, greater than 50 kilovolts (kV), would require relocation. At Genesee Avenue, the temporary overhead transmission line would be housed in the new bridge. At Via de la Valle, the transmission pole may be moved 65.6 ft to the east, if it cannot be protected in place. The transmission pole south of SR-76 would move 65.6 ft to the west.

The proposed project would require several design exceptions to avoid relocation of four poles carrying 230 kV to 270 kV electrical transmissions lines. If design exceptions cannot be granted, these poles and associated lines would require relocation to avoid conflicts with the proposed freeway widening. Poles would be relocated just west of their existing locations within the same unpaved graded lot. Any relocation activities would be coordinated with SDG&E.

Table 2.2.2: Interchange/Ramp Reconfiguration

Interchange	Ramps	Proposed Lane Geometry Modifications
Genesee Avenue	SB & NB	Adding lanes to SB on-ramp, 1 SOV and 1 HOV, totaling 3 ramp lanes NB Braided on-ramp (1 HOV and 2 SOV), totaling 3 ramp lanes
Roselle Street	SB	Adding lanes to SB ramp, 1 SOV and 1 HOV, totaling 3 ramp lanes to merge with SB I-5. An additional SOV lane would diverge (split) from the SB on-ramp and merge with the SB Braided off-ramp to Genesee Avenue
Del Mar Heights Road	SB & NB	SB ramp adjustments to remove free right-turn capabilities Convert NB left/through/right lane to a right-turn lane, Add a left-through lane (creating dual right and dual lefts) Adding lane to NB on-ramp and westbound (WB) to SB on-ramp, 1 HOV, totaling 3 ramp lanes respectively Adding lane to eastbound (EB) to SB on-ramp, 1 SOV, totaling 3 ramp lanes
Via de la Valle	SB & NB	SB ramp adjustments to remove free right-turn capabilities. Widen Via de la Valle to add an exclusive WB right-turn lane NB ramp adjustments to remove free right-turn capabilities. Widen Via de la Valle to add an exclusive EB right-turn lane WB to SB on-ramp would remain as 2 SOV lanes. Adding lane to EB to SB on-ramp Adding lane to EB to SB on-ramp, 1 SOV, totaling 3 ramp lanes
Manchester Avenue	SB	SB ramp adjustments to remove free right-turn capabilities. Widen WB Manchester Avenue to add a second right-turn lane (creating dual right-turn lanes)
Birmingham Drive	SB & NB	Proposed Roundabouts on the east and west sides of the overcrossing, otherwise there would be standard signalized intersections Adding lane to SB on-ramp, 1 HOV, totaling 3 ramp lanes Adding lane to NB on-ramp, 1 SOV, totaling 3 ramp lanes

Table 2.2.2 (cont.): Interchange/Ramp Reconfiguration

Interchange	Ramps	Proposed Lane Geometry Modifications
Santa Fe Drive	SB & NB	Convert SB through lane to a shared through left-turn lane. Extend exclusive right-turn lane. Widen Santa Fe Drive to add a second WB left-turn lane (creating dual left-turn lanes). Widen Santa Fe Drive to add a second EB left-turn lane (creating dual left-turn lanes) Adding lane to SB on-ramp, 1 SOV, totaling 3 ramp lanes Adding lanes to NB on-ramp, 1 SOV and 1 HOV, totaling 3 ramp lanes
Encinitas Boulevard	SB& NB	SB adding an exclusive left-turn lane (creating one left-turn lane and one left-through lane)*; adding an exclusive SB right-turn lane (creating dual right-turn lanes). Widen Encinitas Boulevard to add a second WB left-turn lane (creating dual left-turn lanes)* NB adding an exclusive NB left-turn lane (creating one left-turn lane and one left-through lane)*; adding an exclusive NB right-turn lane (creating dual right-turn lanes). Widen Encinitas Boulevard to add a second EB left-turn lane (creating dual left-turn lanes); and to add a third EB through lane.* Adding lane to SB on-ramp, 1 SOV, totaling 3 ramp lanes Adding lane to NB on-ramp, 1 SOV, totaling 3 ramp lanes
Leucadia Boulevard	NB	Adding lane to NB on-ramp, 1 SOV, totaling 3 ramp lanes
La Costa Avenue	NB	Adding lane to NB on-ramp, 1 SOV, totaling 3 ramp lanes
Palomar Airport Road	SB	Ramp adjustments to remove free right-turn capabilities Adding lane to WB to SB on-ramp, 1 SOV, totaling 3 ramp lanes
Tamarack Avenue	SB & NB	SB adding a WB left-turn lane (creating dual lefts) NB adding a right-turn lane (creating dual right-turn lanes) Adding lane to NB on-ramp, 1 SOV, totaling 2 ramp lanes

Table 2.2.2 (cont.): Interchange/Ramp Reconfiguration

Interchange	Ramps	Proposed Lane Geometry Modifications
Carlsbad Village Drive	SB & NB	Convert the SB shared left/through/right lane to a second right-turn lane; add a shared left-turn through lane (creating a single left-turn lane and dual right-turn lanes). Widen Carlsbad Village Drive to add a second WB left-turn lane (creating dual left-turn lanes). NB left-turn lane separated, right-turn lane converted to a shared left/through/right lane. Widen Carlsbad Village Drive to add a second EB left-turn (creating dual left-turn lanes). Adding lane to NB and SB ramps, 1 SOV, totaling 2 ramp lanes
Las Flores Drive	SB & NB	Adding single lanes to SB and NB on-ramps, 1 SOV each, totaling 2 ramp lanes in each direction
SR-78	SB & NB	Adding lane to SR-78 to SB I-5 Connector, 1 SOV, totaling 2 connector lanes Remove EB SR-78 to NB I-5 Connector
Oceanside Boulevard	SB & NB	Convert SB shared left/through/right-turn lane into two separate lanes: shared left/through lane, and exclusive right-turn lane. Retain exclusive left-turn lane (creating dual left-turn lanes). Widen Oceanside Boulevard to extend the existing WB to SB right-turn lane further east along Oceanside Boulevard (to near the I-5 NB ramps/Oceanside Boulevard intersection) to increase traffic storage. Widen Oceanside Boulevard to extend WB left-turn lane storage. Widen Oceanside Boulevard to extend EB left-turn lane storage Adding lane to SB on-ramp, 1 SOV, totaling 3 ramp lanes Convert 1 SOV lane, NB on-ramp, to 1 HOV lane, resulting in 1 SOV and 1 HOV, totaling 2 ramp lanes
Mission Avenue	SB & NB	Ramp adjustments to remove free right-turn capabilities. Remove EB to SB on-ramp; add dual EB left-turn lanes. Convert SB through/left to an exclusive left-turn lane (creating dual lefts); convert the exclusive SB right-turn lane to a shared through/right-turn lane. Widen Mission Avenue to extend WB left-turn lane storage. Remove NB to EB free right-turn lane, add a second EB left-turn lane (creating dual lefts), add SB dual left-turn lanes Adding lane to SB on-ramp, 1 SOV, totaling 3 ramp lanes Adding 2 lanes to NB on-ramp, 1 SOV and 1 HOV, totaling 2 ramp lanes

Table 2.2.2 (cont.): Interchange/Ramp Reconfiguration

Interchange	Ramps	Proposed Lane Geometry Modifications
SR-76	SB &NB	Addition of a second NB left-turn lane (creating dual lefts) Adding lane to SB and NB ramps, 1 HOV, totaling 3 ramp lanes Remove loop structure (currently closed to traffic) located in the northeast quadrant of the interchange.
Harbor Drive	SB & NB	Ramp adjustments to remove free right-turn capabilities (a separate project reconstructed the I-5 SB ramps / Harbor Drive intersection removing the free right-turn capabilities. The *I-5 NCC Project* would, however, still realign the SB on-ramp from Harbor Drive). Widen WB Harbor Drive to extend the existing exclusive right-turn lane further east along Harbor Drive (up to Harbor Drive / San Rafael / Vandegrift Boulevard Intersection) to increase traffic storage. Widen WB Harbor Drive to extend WB left-turn lane storage. NB re-alignment to WB off-ramp to align with San Rafael intersection (EB right-turn would be controlled by signal and would no longer be a free right turn); convert NB shared through/right-turn lane into an exclusive through lane, eliminating the NB right-turn movement. EB Harbor Drive undercrossing off-ramp would be a new one-lane off-ramp that would facilitate traffic from EB Harbor Drive to SB San Rafael Drive. The off-ramp would diverge from EB Harbor Drive, then traverse under the I-5 NB off-ramp to EB Harbor Drive/ Vandegrift Boulevard, continue parallel to this off-ramp and terminate as a right-turn lane to SB San Rafael Drive. Adding lane to NB on-ramp, 1 SOV, totaling 2 ramp lanes

SB = southbound, NB = northbound, EB = eastbound, WB = westbound
HOV = high occupancy vehicle, SOV = single occupancy vehicle
*To be cleared by the I-5/Encinitas Boulevard Project Environmental Document

Table 2.2.3: Structure Replacements and Widenings

I-5 Overcrossings & Lagoon Bridges Replacement & Widening	Bridge #	10+4 Barrier Alternative	10+4 Buffer Alternative	8+4 Barrier Alternative	8+4 Buffer Alternative	No Build Alternative
La Jolla Village Drive OC	57-0525	Not replaced or widened				
Genesee Ave	57-0527	Replaced and widened by others to not preclude *I-5 NCC Project* alternatives				
Del Mar Heights Rd OC	57-0487	No	No	No	No	No
Birmingham Dr OC	57-0529	Yes	Yes	Yes	Yes	No
MacKinnon Ave OC	57-0530	Yes	Yes	Yes	Yes	No
Requeza St OC	57-0532	Yes	Yes	Yes	Yes	No
Leucadia Blvd OC	57-0554	Yes	Yes	Yes	Yes	No
La Costa Ave OC	57-0460	Yes	Yes	Yes	Yes	No
Batiquitos Lagoon	57-0459	Yes	Yes	Yes	Yes	No
Poinsettia Lane OC	57-0555	Yes	Yes	Yes	Yes	No
Palomar Airport Rd OC	57-0556	Yes	Yes	Yes	Yes	No
Agua Hedionda	57-0282	Yes	Yes	Yes	Yes	No
Chinquapin Ave OC	57-0672	Yes	Yes	Yes	Yes	No
Tamarack Ave OC	57-0276	Yes	Yes	Yes	Yes	No
Las Flores Dr OC	57-0272	Yes	Yes	Yes	Yes	No
Jefferson St OC	57-0271	Yes	Yes	Yes	Yes	No
Buena Vista Creek	57-0277	Yes	Yes	Yes	Yes	No
SR-78 / I-5 Separation	57-0270	Yes	Yes	Yes	Yes	No
Cassidy St OC	57-0269	Yes	Yes	Yes	Yes	No
California St OC	57-0268	Yes	Yes	Yes	Yes	No
Brooks St OC	57-0701	Yes	Yes	Yes	Yes	No
Mission Ave OC	57-0266	Yes	Yes	Yes	Yes	No
Fourth St / Bush St OC	57-0702	Yes	Yes	Yes	Yes	No
Neptune Way / 8th St OC	57-0703	Yes	Yes	Yes	Yes	No
I-805 Sorrento Valley	57-0786	Not replaced or widened				
Carmel Creek	57-1062	Yes (SB)	Yes (SB)	Yes (SB)	Yes (SB)	No
Carmel Valley Rd	57-0486	Yes	Yes	Yes	Yes	No
San Dieguito River	57-0488	Yes	Yes	Yes	Yes	No
Lomas Santa Fe UC	57-0479	No	No	No	No	No

Table 2.2.3 (cont.): Structure Replacements and Widenings

I-5 Undercrossing Replacements and Widening	Bridge #	10+4 Barrier Alternative	10+4 Buffer Alternative	8+4 Barrier Alternative	8+4 Buffer Alternative	No Build Alternative
Via de la Valle UC	57-0489	Yes	Yes	Yes	Yes	No
Manchester Ave UC	57-0458	Yes	Yes	Yes	Yes	No
Santa Fe Dr UC	57-0531	Yes	Yes	Yes	Yes	No
Encinitas Blvd UC	57-0533	Yes	Yes	Yes	Yes	No
Cannon Rd UC	57-0249	Yes	Yes	Yes	Yes	No
Chestnut Ave UC	57-0275	Yes	Yes	Yes	Yes	No
Carlsbad Village Dr UC	57-0274	Yes	Yes	Yes	Yes	No
Loma Alta Creek	57-0125	Yes	Yes	Yes	Yes	No
Oceanside Blvd OH	57-0124	Yes	Yes	Yes	Yes	No
I-5 / SR-76 Separation	57-0704	Yes	Yes	Yes	Yes	No
San Luis Rey River	57-0713	Widened only				No
Harbor Drive/Camp Pendleton UC	57-0235	Yes	Yes	Yes	Yes	No
Proposed New Bridges	**Bridge #**	**10+4 Barrier Alternative**	**10+4 Buffer Alternative**	**8+4 Barrier Alternative**	**8+4 Buffer Alternative**	**No Build Alternative**
I-5 HOV Flyover-SDH1		Yes	Yes	Yes	Yes	No
I-5 HOV Flyover-SDH2		Yes	Yes	Yes	Yes	No
Voigt DAR (structure modifications)		Yes	Yes	Yes	Yes	No
Manchester Avenue DAR UC 1 (DAR tunnel)		Yes	Yes	Yes	Yes	No
Manchester DAR UC 2 (DAR on-ramp)		Yes	Yes	Yes	Yes	No
Carmel Valley Creek – Sorrento Valley Road		Yes	Yes	Yes	Yes	No
Genesee G1M-NB Braided Ramp		Yes	Yes	Yes	Yes	No
Genesee G4A- SB Braided Ramp		Yes	Yes	Yes	Yes	No
Oceanside Blvd OH (NB Off-ramp)		Yes	Yes	Yes	Yes	No
Harbor NB Off-ramp UC		Yes	Yes	Yes	Yes	No
North of Del Mar Heights Pedestrian OC		Yes	Yes	Yes	Yes	No
Union Street Pedestrian OC		Yes	Yes	Yes	Yes	No

OC – Overcrossing, UC – Undercrossing, MED – Median widening (inside widening), OH – Overhead, NB – Northbound (outside widening), SB – Southbound (outside widening), DAR – Direct Access Ramp

Table 2.2.4: I-5 Bridge Widths (in feet) for the 8+4 Buffer Alternative

Bridge Structures	Existing Bridge Width	Proposed Bridge Width	Existing Bridge Length	Proposed Bridge Length	Notes
Los Peñasquitos Lagoon					
Soledad Canyon Creek[1]	NA[4]	60*	N/A[4]	863*	HOV Connector flyover bridge across the creek
Los Peñasquitos Creek[1]	NA[4]	60*	NA[4]	3376*	HOV Connector flyover bridge across the creek
Carmel Creek[2]	179-209	188-225	421	421	Bridge would be widened to the west
Sorrento Valley[3]	NA[4]	15	NA[4]	443	--
San Dieguito Lagoon/River	179	258	650	650	Bridge would be widened to the west and east
San Elijo Lagoon	176-188	303-388	340	560	Width of bridge varies due to Manchester Avenue on- and off-ramps. Bridge supports would include 3 rows of approximately 12 or 13 columns each
Batiquitos Lagoon	2 68-ft bridges w/ a 19.2-ft gap	2 101-ft bridges w/ a 19.2-ft gap	219	282	Bridge supports would include 2 rows of 10 columns each
Agua Hedionda Lagoon	157.5	269	191	191	--
Buena Vista Lagoon	184	310	102.4	197	Bridge supports would include 2 rows of 32 columns each
Loma Alta Creek	169	252[5]	139	139	There are 2 bridges. One is over Loma Alta Creek and one is over Oceanside Boulevard. The Oceanside Boulevard Bridge would remain 193 ft.

Table 2.2.4 (cont.): I-5 Bridge Widths (in feet) for the 8+4 Buffer Alternative

San Luis Rey River	100-ft west bridge narrowing to 26 ft for portion of connector (SB off-ramp); 78-ft east bridge 28-ft gap	Approx. 26-ft (SB off-ramp connector) to 221-ft (NB & SB I-5 combined). This represents approx. 30-ft median widening and 35-ft east bridge widening	594-ft west bridge w/361-ft connector (SB off-ramp segment) (total 955 ft) 681-ft east bridge	594-ft west bridge w/361-ft connector (SB off-ramp) segment (total 955 ft) 681-ft east bridge	The existing bridges vary in length and width.

[1] Flyover bridge, [2] Main I-5 bridge, [3] Bicycle bridge, [4] NA = There is no existing bridge at this location, [5] Designed in English units

* The HOV Connector consists of two bridges connected in the center by a portion of roadway that lies on an embankment outside of the creek. The flyover bridges directly above Soledad Canyon Creek and Los Peñasquitos Creek, respectively, are noted above. The total length of the HOV Connector would be approximately 4459 ft, while the two bridges combined would be approximately 4239 ft.

Soundwalls and Retaining Walls

Soundwalls are proposed on both Caltrans and private right-of-way as described in *Section 3.7, Visual/Aesthetics.* Retaining walls would be used in numerous locations throughout the project area to reduce property acquisition impacts, stabilize slopes, minimize environmental impacts, and accommodate engineering structures. Approximate locations of the retaining walls, as well as soundwalls preliminarily found to be "reasonable" and "feasible" (please refer to *Section 3.15, Noise,* for discussion), are identified on the Project Features Maps (*Figures 2-2.3, Sheets 1* through *67).*

Drainage

Due to widening that would occur with this project, most of the existing culverts would need to be extended, replaced, or lined depending on their condition. New drainage facilities would be constructed adjacent to cross roads, including storm drain inlets, storm ditches, rock slope protection, and headwalls. Some of the existing drainage systems would be abandoned and replaced.

Transit Opportunities

The HOV/Managed Lanes provide an opportunity to expand the regional bus system by allowing transit vehicles to enter and exit the HOV/Managed Lanes toll free. The regional bus transit in the North Coast Corridor area is currently servicing local arterial roadways only. Route 101 provides all day local bus service on Coast Highway. Route 309 provides all day local bus service on El Camino Real from Oceanside to Encinitas. Route 310 provides very limited express bus service on I-5 from Oceanside to University Towne Centre in San Diego.

HOV/Managed Lane Enforcement

Any violations of law in regard to the HOV/Managed Lanes would be enforced by the CHP, and response and enforcement protocol would need to occur in a cooperative agreement between CHP and Caltrans/SANDAG. Policy would have to include a requirement that an SOV traveling in the HOV/Managed Lanes must render a per-trip payment using a valid transponder or other similar technology. HOV users would not be required to use a transponder or pay a toll. To indicate when valid transponders are read, a gantry-mounted indicator light above the two tolling points, similar to other freeway facilities, would be used. Routine enforcement would be performed by the CHP through the use of head counts to verify occupancy. This enforcement takes place in a single enforcement zone, which is also the sole tolling point (toll zone) on the facility. Periodic violation rate surveys and manual vehicle occupancy counts on I-15 have reported that initial manual enforcement presence resulted in a decrease in violation rates from approximately 15 percent to as low as 5 percent, although that number has fluctuated since the FasTrak® program began in 1998 and has recently been closer to 15 percent of the total average daily traffic on the I-15 reversible lanes. This evidence seems to support the theory that while heavy enforcement presence may produce positive results in terms of lowered overall violation rates; those results are difficult to sustain in the absence of the enforcement officer or a more automated violation detection and enforcement system.

Design Revisions to Avoid and Reduce Impacts

In addition to the consideration of what project improvements are needed along the I-5 corridor (refer to *Section 1.3, Need for the Project*), evaluation of the potential for avoiding and reducing impacts has also been an ongoing process. Throughout project design, the project development team has been reviewing opportunities for avoidance and minimization of potential

project impacts. This has included shifts in facility location, as well as redesign (and in some cases elimination) of potential project features.

Specific to revisions made following receipt of comments on the Draft EIR/EIS, redesign of the Manchester DAR resulted in the reduction of anticipated visual impacts. The visual impact associated with I-5 in the vicinity of this interchange was identified as "high" in the Draft EIR/EIS based on the bridges, large terrain-contour retaining walls, loss of trees, and provision of a bus platform and parking lot for 400 cars within a scenic area, combined with anticipated viewer response. The resulting design changes include revising the DAR to an undercrossing, reduction of parking to approximately 150 spaces, and commitment to use pervious hardscape to the extent practicable. In addition, as previously noted, two DARs located at Cannon Road and Oceanside Boulevard have been eliminated from the proposed project. Originally proposed based on local interest for DARs at these two locations, over time it has become clear that either: (1) funding is not certain, and/or (2) decisions as to future land uses in these areas are still under consideration. Deletion of the two DARs from the current proposed project allows for further consideration of these locations by the local jurisdictions, without eliminating the possibility of future implementation of I-5 DARs at these, or other applicable locations following additional environmental review. Elimination of the two noted DARs would not adversely affect traffic flow as described in the Draft EIR/EIS. Also, as a result of public comment, one soundwall has been modified in design. This solid soundwall (S603) would have obscured an ocean view in Solana Beach between Via de la Valle and Lomas Santa Fe Drive. S603 has now been redesigned to contain a gap, in order to preserve potential coastal views from I-5.

As noted in *Section 2.2.1*, proposed bridge dimensions have been revised as an enhancement component to optimize lagoon function. Specific to construction at Batiquitos Lagoon, the potential to modify phasing so that full bridge replacement would occur during the first phase of I-5 improvements was disclosed in the Supplemental Draft EIR/EIS circulated in August 2012. Review of the potential for acceleration of this bridge construction continued during design refinement following public review of that document. As noted in the Supplemental Draft EIR/EIS, acceleration of the I-5 Batiquitos Lagoon Bridge so that all construction activities would be completed in the first phase would minimize the wetland impacts. Funds have now been secured to move the Batiquitos Bridge forward to the first phase of construction, reducing impacts by almost 1.7 acres to wetland and over 1.0 acres of sensitive upland.

Improvements to wildlife crossings have also been further clarified and incorporated into project design at five of the lagoons (excepting San Dieguito), and bike/pedestrian trail improvements have been clarified for each of the crossed waterways, including incorporation of additional detail regarding bike/pedestrian trails suspended from I-5 bridges. Bike/pedestrian trails would be minimized to reduce impacts through sensitive areas. The typical width of a shared pedestrian and bicycle trail would be 12 ft. While design has not been finalized, co-located bike/pedestrian trails are anticipated to consist of an eight-ft-wide paved surface with two-ft soft-surface shoulders on either side. As no bikes are allowed in the ecological reserves adjacent to most of the lagoons, the trails through these areas would be for pedestrian use only with the exception of the new NC Bike Trail's north-south connections. Through the use of fencing and signage (see *Figure 2-2.7* for an example sign), bicycles would be prohibited from entering the adjoining lagoon trails. This sign provides a sample format. Caltrans would work with the agency/foundation that controls each lagoon to develop signs that meet the specific needs at that location). The reader is also referred to *Section 2.3*, below, for additional detail on these features.

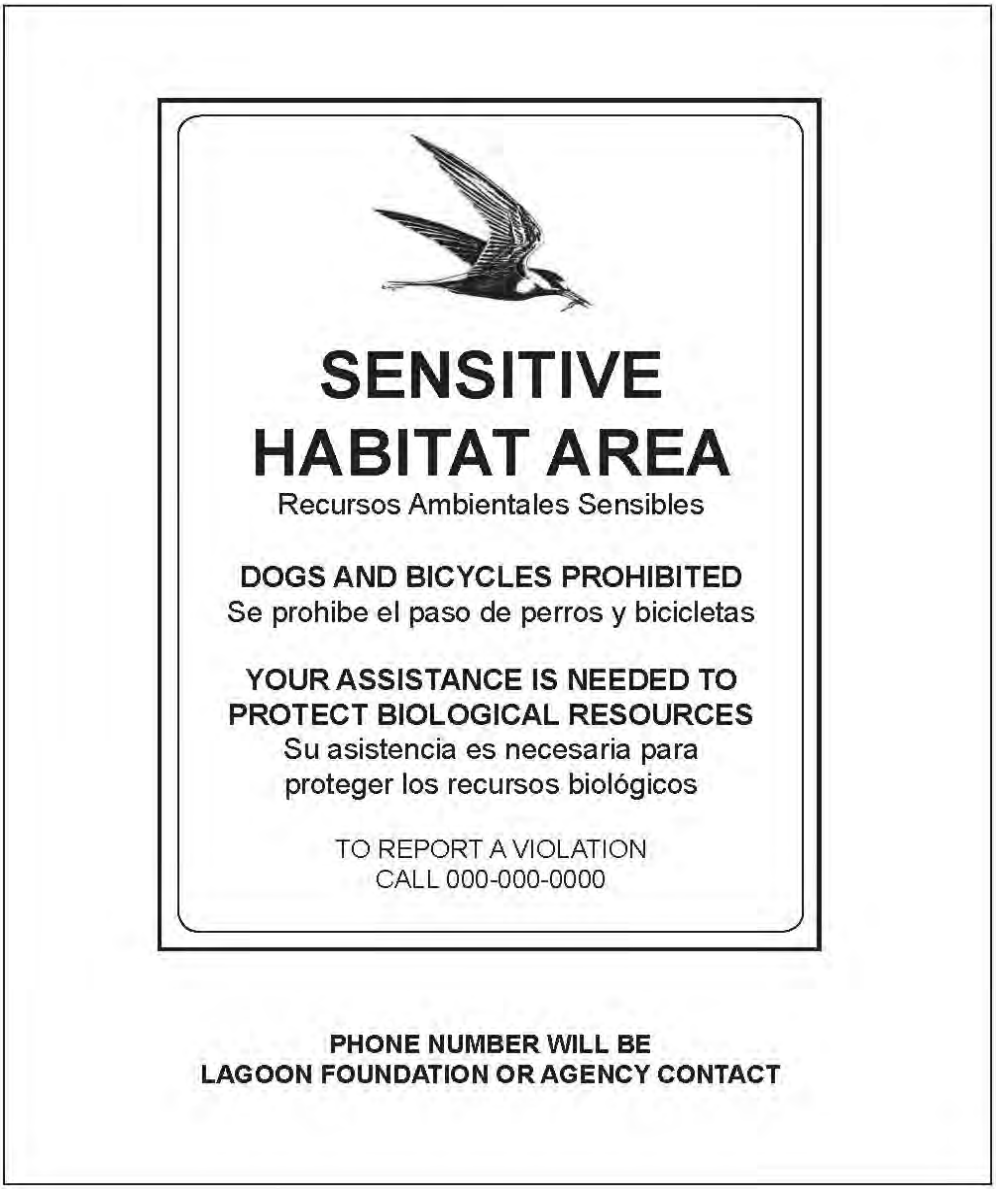


Figure 2-2.7: Example Sensitive Habitat Area Sign

Project Design Measures to Benefit Regional Air Quality

One of the key objectives of the *I-5 NCC Project* is to improve the efficient regional movement of people and goods, averting future conditions associated with substantial gridlock on the facility. Improvement of traffic flow, along with provision of improved bike/pedestrian facilities as community enhancements, would improve regional air quality once in operation. As a result, even considering the potential for increased mobility, the project would be consistent with regional air quality conformity goals. Specifics are detailed below.

As described in *Section 3.14, Air Quality*, of the Draft EIR/EIS, the project build alternatives are designed to maintain or reduce travel time through reduction in traffic congestion along the I-5 corridor. As a result, they would improve air quality impacts associated with existing conditions.

Over time, these improvements would be partially offset by the increase in the number of vehicles using the roadway.

Given the forecasted population growth (an additional approximately one million people by 2040) in the region, traffic projections indicate that Vehicle Miles Traveled (VMT) on I-5 will increase approximately 31 percent over the next 30 years (refer to Corridor System Management Plan [CSMP] Figure 4.7). This increase in travel demand is expected to occur even if capacity is not increased on I-5.

With the addition of the four (maximum) HOV/Managed Lanes (express lanes), VMT is expected to increase an additional 4 percent (refer to CSMP Figure 4.7) above "no-build" projections, and would result in a total VMT increase of 35 percent. This minor additional increase is associated with the potential for the project improvements to induce people to travel I-5 who would not otherwise do so (e.g., by making I-5 more convenient than their existing alternate routes). These trips would likely be drawn from parallel arterials, such as El Camino Real and Coast Highway. This phenomenon is sometimes referred to as "latent demand."

A number of regional and project strategies/improvements have been proposed to reduce the rate of growth in VMT, by providing options to the use of SOVs. These include:

- Proposed community enhancements include bike and pedestrian facilities designed to significantly expand and improve the functionality of the existing bicycle and pedestrian system.

- The express lane system is designed to provide a competitive option to SOVs by ensuring a reliable, congestion-free travel option throughout the corridor for carpools, vanpools, and buses. In doing so, the corridor would move more people per VMT.

- The express lane system includes a congestion pricing element, designed to allow solo drivers to use the express lanes only by paying a fee, using the region's FasTrak® system. Fee revenue generated through FasTrak® would support transit within the corridor.

- In addition to the construction of the express lanes, the region is concurrently working to significantly expand commuter and interregional rail services. Much like the express lanes, these improvements are designed to provide a competitive option to SOVs.

- The three-pronged Transportation Demand Management (TDM) strategy includes outreach, education, and incentives to reduce solo driving through improved van pools, carpools, telework, and bicycle programs.

- SANDAG is working to minimize urban sprawl, through the implementation of Sustainable Community Strategies (SCS). These strategies result in 80 percent of San Diego's new homes and jobs being planned in areas to be served by the region's Urban Area Transit Strategy (refer to 2050 RTP page 3-6).[2] Additionally, of the 388,000 homes planned in the region by 2050, 85 percent are planned as multi-family homes (refer to 2050 RTP Appendix 7).

[2] As discussed in more detail in *Section 3.14* of this document, the EIR for the 2050 RTP has been challenged based on issues associated with greenhouse gas emissions. A current judgment against the EIR is being appealed. While the judgment may or may not be overturned on appeal, it does not affect the current EIR/EIS. FHWA, and Caltrans' environmental analysis for the *I-5 NCC Project* may draw on facts from the EIR for the 2050 RTP; but it does not tier from the 2050 RTP EIR, or rely on the EIR's certification.

The goal is to reduce the regional VMT growth by up to four percent through the implementation of the above strategies.

The *I-5 NCC Project* includes a number of operational and transportation system management (TSM) improvements (e.g., ramp meters, vehicle detection, and changeable message signs), designed to maximize the efficiency of the existing system and to provide improved traveler information. These key project elements would improve air quality by reducing overall congestion levels and further minimizing the impact of added VMT.

While VMT increases are not necessarily desirable due to potential emissions and fuel consumption impacts, freeway VMT is only one component of the air quality analysis. In this case, the 35 percent VMT increase related to latent and induced demand would be more than offset by improved vehicle speeds (reduced congestion) and decreases in VMT on local arterials. Specifically, construction of the four (maximum) HOV/Managed Lanes (express lanes) would provide the following air quality-related benefits when compared to the No Build alternative:

- A 10 to 15 percent reduction in VMT on El Camino Real and Pacific Coast Highway
- A 47 percent reduction in Vehicle Hours of Delay (VHD) (defined as 35 miles per hour or less; refer to CSMP Table 8.8)
- A decrease in the duration of daily peak-period congestion on I-5 from 12–13 hours to 5-6 hours

Regional and Community Enhancements

A number of regional and community enhancements are proposed for potential implementation regardless of the alternative chosen. These are discussed in detail in *Section 2.3, I-5 North Coast Regional and Community Enhancement Projects,* below.

2.2.3 Transportation System Management, Multimodal and Transportation Demand Management Alternatives

TSM and Multimodal Alternatives

The TSM and Multimodal alternatives consist of strategies to maximize efficiency of the existing facility by providing options such as ridesharing, parking, and traffic-signal optimization. TSM options to improve traffic flow typically increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Such strategies include replacing existing stop signs with traffic signals at intersections to improve existing peak hour traffic flow and reduce queuing of vehicles. TSM also encourages automobile, public and private transit, ridesharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system. Multimodal alternatives integrate multiple forms of transportation modes, such as pedestrian, bicycle, automobile, rail, and transit.

Although TSM measures alone could not satisfy the purpose and need of the project, TSM measures have been incorporated into the build alternatives for this project.

TDM Alternative

The TDM alternative focuses on regional strategies for reducing the number of vehicle trips and VMT, as well as increasing vehicle occupancy. It facilitates higher vehicle occupancy or reduces traffic congestion by expanding the traveler's transportation choices in terms of travel

method, travel time, travel route, travel costs, and the quality and convenience of the travel experience. Typical activities within this alternative reduce the amount of SOV trips by providing funds to regional agencies that are actively promoting ridesharing, maintaining rideshare databases, and providing limited rideshare services to employers and individuals. Promoting mass transit and facilitating non-motorized alternative means of transportation are two such examples, but TDM strategies may also include reducing the need for travel altogether through initiatives such as telecommuting. In some cases, TDM may also involve changing work schedules, with the resultant greater travel flexibility producing a more even pattern of transportation network use, muting the effect of morning and evening rush hours.

Although many TDM measures are specific to employers or land use planning agencies, and are beyond the jurisdiction of Caltrans and FHWA, the project incorporates important elements that support these overall programs. Specific to the discussion above, the project would provide HOV/Managed Lanes that would contribute to reduction in SOVs and would also support completion of segments of the I-5 North Coast Bike Trail, which would support non-motorized transportation modes.

2.2.4 No Build Alternative

Environmental review must consider the effects of not implementing the proposed project. The "no build" analysis must discuss the existing conditions as well as what other projects would be reasonably expected to occur in the foreseeable future if the proposed project was not approved. The No Build alternative provides a baseline for comparing the impacts with the other alternatives.

Under the No Build alternative, some projects would move forward separately; however, many of the proposed improvements would not be constructed, including the community enhancements. This alternative would not propose any changes to the existing number of lanes or the configuration of as many intersections along the corridor. With the No Build alternative, traffic would continue to increase, which would cause longer delays and further congestion. The No Build alternative would not improve access for bikes and pedestrians. The No Build alternative would not meet the project's Purpose and Need.

The No Build alternative offers a basis of comparison with the build alternatives and would include ongoing operations and maintenance. In addition, a number of interchange/ operations/adjacent projects would potentially move forward separately or are already moving forward separately from the *I-5 NCC Project,* and would be analyzed within separate environmental documents. The following is a list of those projects:

- I-5 / Genesee Avenue Interchange Improvements
- I-5 / SR-56 Interchange Improvements
- I-5 / SR-78 Interchange Improvements
- I-5 "Mid-Coast" Freeway Improvements (8-10+2 HOV facility from I-8 to I-805) Sorrento Valley Road/Roselle Street Improvements
- Encinitas Boulevard Interchange Improvements
- LOSSAN Rail Improvements (double-tracking of rail corridor between Los Angeles and San Diego)
- Gilman Overcrossing

- I-805 northbound DARs at Carroll Canyon Road and HOV lanes between Carroll Canyon Road and the I-5 / I-805 junction

Without the proposed additional through lanes on I-5, however, the anticipated increase in traffic volumes would be expected to result in additional congestion with longer delays. Proposed project-related improvements related to pedestrian and bike trails discussed below in *Section 2.3* would not occur. Similarly, improvements to the planned transit system would not be supported without the project DARs and HOV/Managed Lanes. The No Build alternative, therefore, would not meet the project's purpose and need.

2.3 I-5 North Coast Regional and Community Enhancement Projects

The *I-5 NCC Project* PDT, along with input from various communities throughout the project corridor, developed a number of possible regional and community enhancement opportunities that would be constructed simultaneously with the *I-5 NCC Project*. The identified regional and community enhancements are not minimization measures for the *I-5 NCC Project* and would not be eligible for federal funding through this project. Minimization measures are incorporated for the *I-5 NCC Project* and can be found in *Chapter 3* under each resource with the sub-heading, *Avoidance, Minimization, and/or Mitigation Measures.* Caltrans staff conducted numerous meetings with the general public, city staff, elected officials, and other stakeholder groups, such as the lagoon foundations and community planning groups, to develop and refine enhancement concepts based on site conditions and regional/community needs. This process followed an extensive "Context Sensitive Design" approach, which encourages increased public participation in the making of design decisions. The three areas of focus in context sensitive design include: actively seeking public involvement throughout the design process; developing designs that meet the needs of specific sites, rather than standardized solutions; and providing flexibility in typical design approaches if environmental, historic, and neighborhood concerns can be resolved through the implementation of a unique solution. Two documents chronicle the enhancement project process for the *I-5 NCC Project* in detail: (1) the I-5 North Coast Community Enhancement Plan (January 2008), which presents the proposed enhancement projects for each city; and (2) the I-5 North Coast Community Enhancement Plan Project Notebook (January 2008), which documents the methodology and decision-making process. These documents work together to describe the reasoning and conceptual design for the identified "candidate" enhancement projects considered for implementation.

These "candidate" projects generally would not have additional impacts over those identified for the *I-5 NCC Project* and tend to be trails, park and ride enhancements, streetscape enhancements, etc. Enhancement opportunities as project features of the *I-5 NCC Project* would occur if the following conditions are met: the enhancements have regional significance, an *I-5 NCC Project* construction segment would include or be adjacent to the location of the community enhancement; the enhancement would preserve and enhance community character and avoid environmental impacts; and future formal cooperative agreements occur between Caltrans and each city, where Caltrans would build these features and Caltrans/the cities would agree on responsibility for their maintenance.

Following public comments received on the Draft EIR/EIS, as well as continued agency and city coordination on community enhancement particulars, some changes were made to enhancements discussed in the Draft EIR/EIS, including:

- Deletion of the Los Peñasquitos Creek Trail

- Modification of the Del Mar Heights pedestrian overpass connection to connect to the proposed NC Bike Trail on the west (as defined below)
- Deletion of the Nature Center at La Costa Avenue and associated southern trail
- Removal of the Harbor Drive regional gateway feature and incorporation of this improvement as part of the project design

In addition, NC Bike Trail elements have been refined and added as a regional enhancement to complement the "Coastal Rail Trail," "Coast to Crest Trail," "Mid County Bicycle Corridor," "El Camino Bicycle Corridor," "Encinitas-San Marcos Bicycle Corridor," "Carlsbad-San Marcos Bicycle Corridor," and "San Luis Rey River Bicycle Corridor," as well as the "California Coastal Trail." The NC Bike Trail in particular would be developed to support non-motorized travel. Each of these modifications, as well as elements of enhancements described below as part of the NC Bike Trail, were additionally reviewed for footprint effects in the August 2012 Supplemental EIR/EIS. Information has been incorporated into this Final EIR/EIS as appropriate.

An overview of regional and community enhancements currently proposed is shown on *Figures 2-3.1a* and *2-3.1b* at the end of this chapter. Typical configurations of lagoon vicinity trails and suspended pedestrian/bike trail segments are shown below on *Figures 2-3.2* and *2-3.3*, respectively, while NC Bike Trail elements located within Caltrans right-of-way and included in the analysis of project impacts are shown on *Figures 2-3.4a* through *2-3.4j* at the end of this chapter.

2.3.1 Regional Enhancement Projects

As previously noted, the NC Bike Trail has been added to the project as a regional enhancement, and is a new facility concept developed to support non-motorized travel. This proposed Bike Trail would extend approximately 27 mi between Gilman Drive in the City of San Diego and Harbor Drive in the City of Oceanside. Portions of the NC Bike Trail would be located within Caltrans right-of-way, rail right-of-way, and local jurisdictions, with Caltrans and SANDAG working with the appropriate jurisdictions to ensure consistency with local bike plans. Connections to these local bike trails and regional bicycle corridors are necessary to promote safe bicycling in the corridor, as well as to create new neighborhood connections, provide enhancements to existing corridors, and connect to regional and inter-regional bicycle facilities. The *I-5 NCC Project* proposes to provide bicycle/pedestrian crossings that currently do not exist at the lagoons along the I-5 corridor, with these facilities to connect with existing non-motorized trails. To accommodate the NC Bike Trail, the *I-5 NCC Project* would include new bike trail elements within sections of the proposed freeway footprint. These sections would fill in gaps between existing trails in the cities along I-5, and connect to other regional and inter-regional bicycle facilities. Specifically, NC Bike Trail crossings would be constructed in association with the I-5 bridges over San Dieguito, San Elijo, Batiquitos, and Agua Hedionda Lagoons. In addition, several non-motorized freeway crossings and local NC Bike Trail connections are proposed to provide safer routes to transit than are currently available. These are proposed at Voigt Drive, along Roselle Street, under I-5 south of the I-5 / SR-56 Interchange, under I-5 at San Dieguito River Bridge, under I-5 at San Elijo Bridge, at an overcrossing at Union Street, and under Harbor Drive. Implementation of the NC Bike Trail would not require additional land acquisition; associated construction activities proposed as part of *the I-5 NCC Project* would be confined to within existing Caltrans right-of-way.

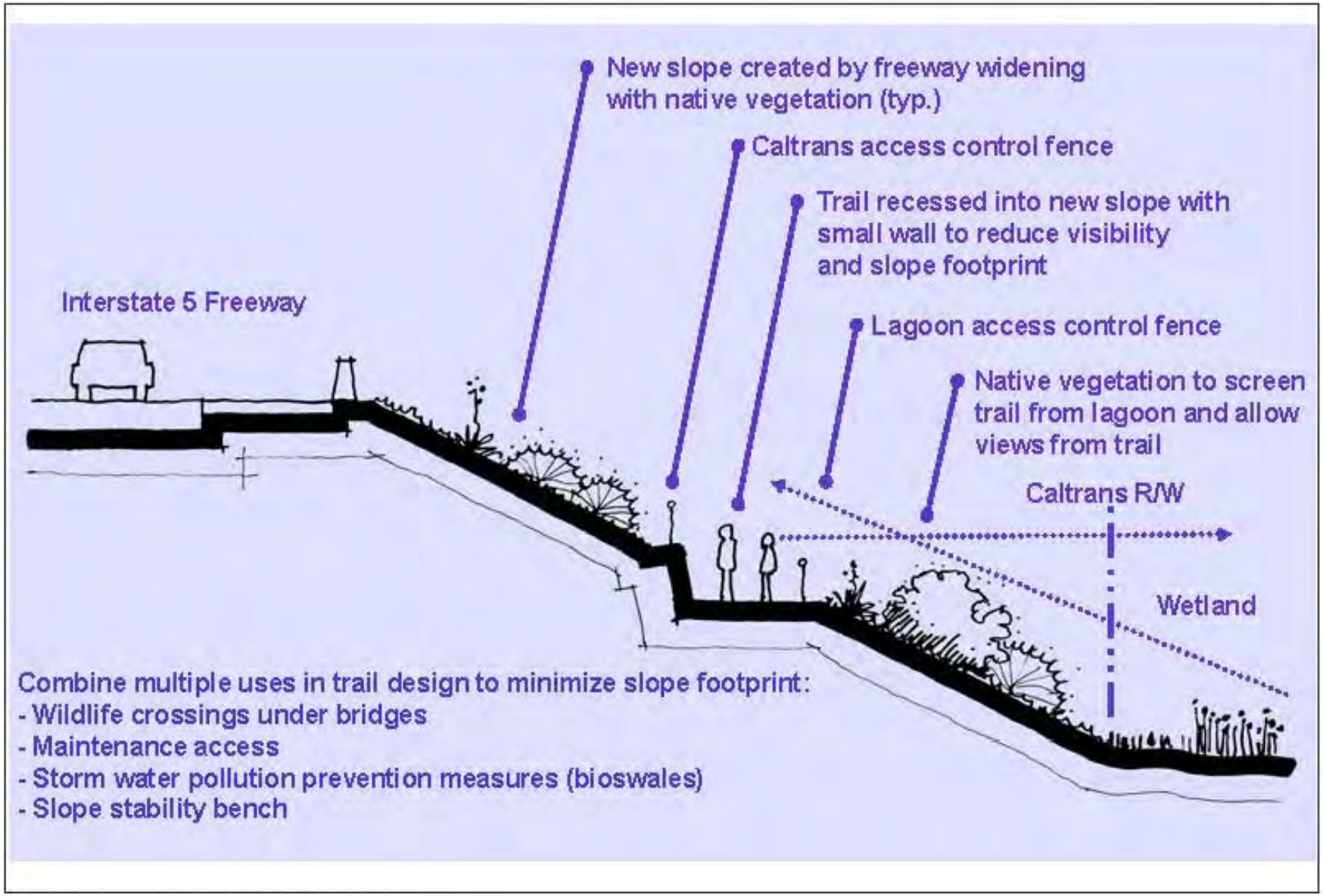


Figure 2-3.2: Typical Lagoon Trail Cross-Section

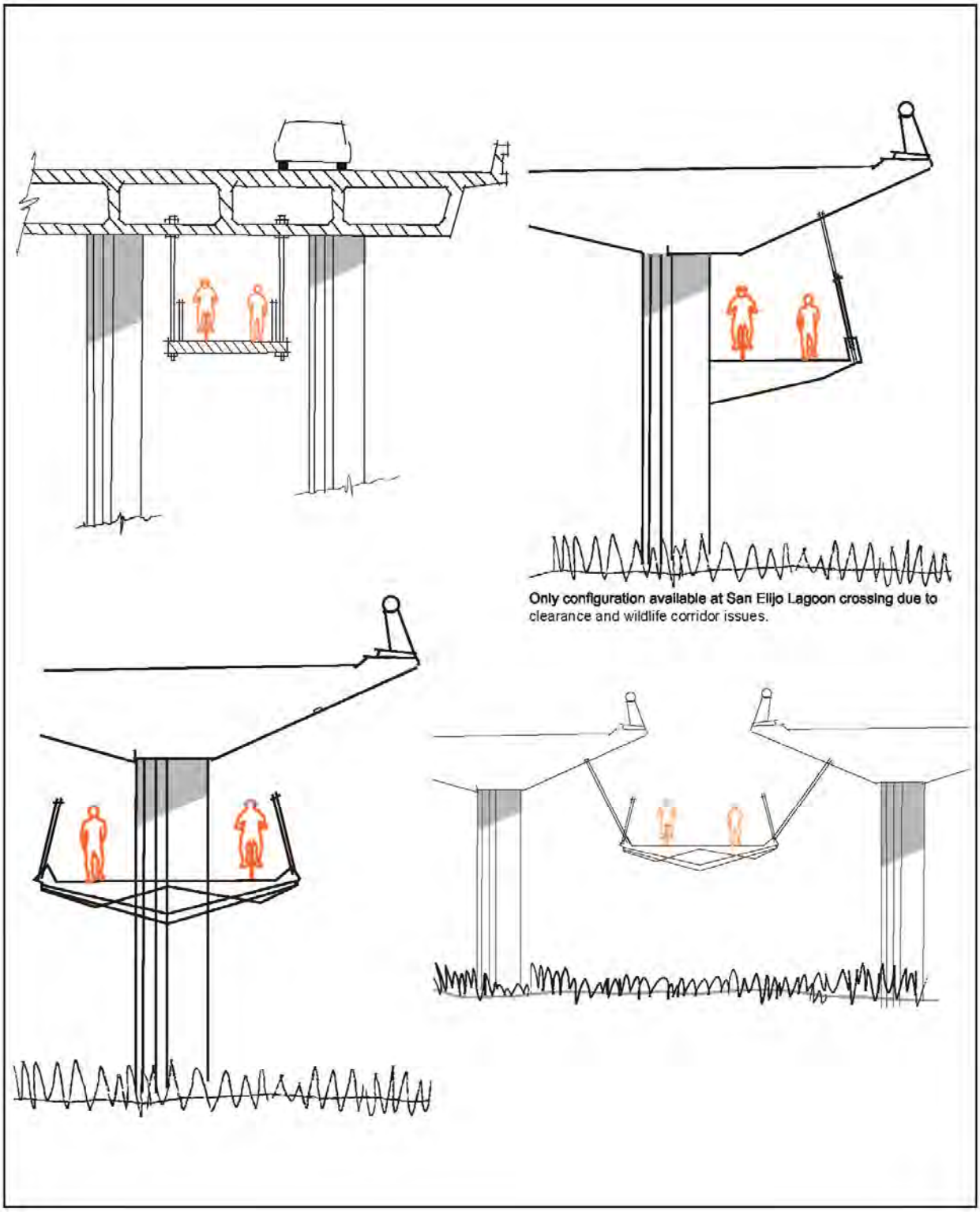


Figure 2-3.3: Suspended Bike/Pedestrian Trail Typical Configurations

Descriptions of the individual NC Bike Trail segments are provided below by city.

Proposed NC Bike Trail Facilities

City of San Diego

The first section of the NC Bike Trail in the City of San Diego would begin at Gilman Drive and extend north for approximately 8.6 mi to Via de la Valle, just south of the City of Solana Beach. This segment would be a Class II bike lane (where a striped and stenciled lane for one-way travel is identified on the street) from Gilman Drive to the Voigt Drive Bridge. It would then continue as a Class I bike path (providing for bicycle travel on a paved right-of-way completely separated from any street) to Roselle Street in Sorrento Valley. At Roselle Street, the bikeway extends east on local streets across the railway and turns north along Sorrento Valley Road to the intersection with Carmel Mountain Road. At this intersection, the route turns back into a Class I bike path on a separate path that eventually intersects an existing park and ride lot and Carmel Valley Road. This segment of the trail is known as part of the Coastal Rail Trail, another proposed regional bicycle corridor. At Carmel Valley Road, the trailheads west on local streets and then north onto Portofino Drive to Del Mar Heights Road, where it returns to a Class I facility along I-5, then crosses the San Dieguito Lagoon and intersects the Coast to Crest Trail before eventually connecting to Via de la Valle, which is a segment of the Mid County Bicycle Corridor.

City of Solana Beach

In the City of Solana Beach, the 2.39-mi segment of the NC Bike Trail would extend west on local streets, including Via de la Valle (a segment of the Mid County Bicycle Corridor), Valley Avenue, Stevens Avenue, and San Rodolfo Avenue. This would direct cyclists to the trailhead at Solana Hills Drive, where a proposed bicycle/pedestrian enhanced trail would cross San Elijo Lagoon within the I-5 freeway footprint and connect to Manchester Avenue, which is part of the "El Camino Bicycle Corridor."

City of Encinitas

The 6.77-mi segment of the NC Bike Trail in the City of Encinitas would include the lagoon crossing between the northern boundary of Solana Beach and Manchester Avenue along I-5 as a Class I facility. The route would then utilize a combination of surface streets and freeway right-of-way through the communities of Cardiff, Encinitas, and Leucadia. Class I bike connections would be from Regal Drive to Encinitas Boulevard (part of the Encinitas-San Marcos Bicycle Corridor), along the bike/pedestrian bridge at Union Street, and from Orpheus Avenue to La Costa Avenue. At La Costa Avenue, the NC Bike Trail would join with the proposed Class I facility in the I-5 footprint to cross Batiquitos Lagoon.

City of Carlsbad

In the City of Carlsbad, the NC Bike Trail would extend approximately 7.33 mi, and would include a Class I bike path crossing of Batiquitos Lagoon that would connect to Avenida Encinas. From that point, the route would utilize surface streets and segments of the Coastal Rail Trail until reaching a second lagoon crossing at Agua Hedionda, which would be a Class I bike path within the I-5 footprint. Improvement north of the NC Bike Trail interface with Avenida Encinas is likely to augment/contribute to the completion of the Coastal Rail Trail in the City.

City of Oceanside

The 4.36-mi segment of the NC Bike Trail in the City of Oceanside would likely augment and/or contribute to the completion of the Coastal Rail Trail, while also possibly including a connection to the Inland Rail Trail and the San Luis Rey River Trail. In addition, by utilizing the Harbor Drive UC, this segment of the NC Bike Trail would also provide connectivity to pedestrian/bike trails north of the San Luis Rey River.

2.3.2 Community Enhancement Projects

Each enhancement opportunity was developed with the following goals and objectives in mind:

Community Goals:

- Preserve existing community character
- Provide amenities (trails, overlooks, interpretive facilities)
- Provide consistency with city general plans, community plans, park master plans, lagoon foundation plans, etc.
- Respect historical resources
- Utilize community input during the project development process

Environmental Goals:

- Preserve sensitive habitat areas; native plant use would be extensive and no invasive species would be used in any I-5 landscaping
- Preserve existing visual resources

Multimodal Circulation Goals:

- Improve pedestrian/bicycle access to transit centers and community destinations
- Minimize conflicts between vehicles and pedestrians
- Provide connections between the east and west sides of the freeway
- Improve pedestrian/bicycle circulation

Physical/Aesthetic Goals:

- Preserve existing natural character of the project corridor
- Provide increased public access to scenic resources
- Buffer views of the freeway from residential and public use areas

The following community enhancements are considered "candidates for inclusion" in the project's final design and may or may not all be implemented, as this would be dependent on agreements reached between Caltrans and the cities to maintain them in perpetuity.

City of San Diego

Carmel Valley Road

There are two community enhancement opportunities located along Carmel Valley Road that include:

Carmel Valley Bicycle/Pedestrian Trail Connection

This enhancement opportunity is a proposed trail connection on Old Sorrento Valley Road, linking this road to the existing SR-56 bike path. This trail connects three existing trail systems; the SR-56 Regional Bike Trail from the east, Sorrento Valley Road Trail from the south, and Carmel Valley Road trail west to the coast. The proposed trail connection would be approximately 1.23 mi long and 12-ft wide, and would comprise a segment of the previously described regional NC Bike Trail. Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife. Specific enhancements would include the following aspects:

- Installation of signs and striping for the Class I facility
- Construction of non-motorized undercrossing at I-5 to link Old Sorrento Valley Road with the SR-56 bike path

- Only plant species native to the local area would be used for disturbed areas
- Fencing to prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.
- Signs to identify sensitive habitat and describe prohibitions regarding night use and pets on trails, as applicable and consistent with current lagoon practices, and to prevent impacts to wildlife using the corridor

Enhanced Park and Ride at Carmel Valley Road

This opportunity would provide enhancements to an existing park and ride lot, including additional parking, trailhead facilities, and pedestrian amenities on approximately 3.16 ac. Specific enhancements would include the following aspects:

- Only plant species native to the local area would be used to create a visual buffer between the trail and the parking area
- Construction of a trailhead scenic overlook at Peñasquitos Lagoon with interpretive exhibits
- Fencing to prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.
- Impacts avoided by reconfiguring and restoring an existing park and ride lot

Old Sorrento Valley Road Bicycle/Pedestrian Enhanced Trail Connections from Carmel Valley Road to Carmel Mountain Road

This opportunity would consist of enhancements to an existing Class I bike path on Old Sorrento Valley Road west of I-5. Proposed enhancements would be located within an approximately 1.1-mi-long and 12-ft-wide segment of the existing trail and would comprise a segment of the previously described regional NC Bike Trail. Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife. Specific enhancements would include the following aspects:

- Replacement of existing culverts with a 443-ft long bridge
- Installation of interpretive overlooks and trail information stations
- Expansion of non-motorized community connections, increased commute options, and provision of safer routes to transit and train facilities
- Only plant species native to the local area would be used for any project-related planting
- Fencing to prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.
- Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails, as applicable and consistent with current lagoon practices, to prevent impacts to wildlife using the corridor

Bicycle/Pedestrian Enhanced Trail and Bridge on the west side of I-5 at San Dieguito Lagoon

This community enhancement opportunity would consist of a new 2.25-mi long and 12-ft-wide Class I bike path connecting Del Mar Heights Road to Via de la Valle and would comprise a segment of the previously described regional NC Bike Trail. Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife. Specific enhancements would include the following aspects:

- Expanded non-motorized community connections
- Increased commute options
- Provision of safer routes to transit facilities
- Use of a retaining wall to allow for trail inclusion in I-5 right-of-way and minimization of footprint

- Only plant species native to the local area would be used for any project-related planting
- Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.
- Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails, as applicable and consistent with current lagoon practices, to prevent impacts to wildlife using the corridor

Pedestrian Overpass Connection North of Del Mar Heights Road

A new bicycle/pedestrian bridge enhancement opportunity over I-5 would be constructed north of Del Mar Heights Road within an existing maintenance easement. The overpass would be approximately 616.8 ft long and 12 ft wide, and would connect Lower Ridge Road on the east to the proposed NC Bike Trail on the west. This bridge would connect adjacent neighborhoods currently divided by the freeway and allow a safe route to school for students living on opposite sides of the freeway. Specific enhancements would include the following aspects:

- Construction of the pedestrian/bicycle bridge from Lower Ridge Road to the NC Bike Trail

City of Solana Beach

Streetscape Enhancements on Ida Avenue

This streetscape community enhancement opportunity would encompass approximately 1.08 ac along a 0.32-mi stretch of Ida Avenue, from Academy Drive to south of Genevieve Street. The improvements would provide street curbs to contain vehicles, sidewalks for pedestrians, landscaping, and screen planting between the neighborhood and the freeway. Specific enhancements would include the following aspects:

- A retaining wall would provide extra space for streetscape improvements, allowing for additional streetscape
- Only plant species native to the local area would be used on slopes to screen the proposed retaining wall and reduce visual impacts

Pedestrian Trailhead at Solana Hills Drive

This enhancement opportunity includes street improvements along the northern end of Solana Hills Drive, construction of a new trailhead, and a trail connection between Solana Hills Drive and the south entrance to the San Elijo Lagoon Ecological Reserve. Identified enhancements would provide improved public access to the Reserve, landscaping, visual relief, and improved overall appearance. The proposed trail connection also would comprise a segment of the previously described regional NC Bike Trail enhancement. Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife. Specific enhancements would encompass approximately 0.5 ac and include the following aspects:

- Sidewalks and curb
- Parallel parking
- Drop-off zone
- Interpretive displays and trailhead facilities
- Only plant species native to the local area would be used for any project-related planting
- Only plant species native to the local area would be used on slopes to screen the proposed retaining wall and reduce visual impacts
- Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate

City of Encinitas

Bicycle/Pedestrian Enhanced Trail on both sides of I-5 at San Elijo Lagoon with Bridge Connection to Manchester Avenue

This enhancement opportunity consists of sidewalk improvements extending along the west side of I-5, crossing under the I-5 Bridge structure at Manchester Avenue and across San Elijo Lagoon, as well as a new 12-ft-wide trail connecting new and existing trail segments on both sides of I-5 (with these areas currently separated by the lagoon and freeway). The trails, plantings, and other improvements would extend over a length of approximately one mi, and would be designed to minimize impacts to the lagoon environment. Specifically, the east/west trail connection would join the existing trails on the shores of the San Elijo Lagoon south of Manchester Avenue, and the north/south connection would span the open water of the lagoon connecting to the east/west sidewalk on Manchester Avenue. This structure would consist of a suspension bridge attached to and under the new widened portion of southbound I-5, with no associated additional impact to the open water below. Specific enhancements would include the following aspects:

- Construction of a bicycle/pedestrian trail structure across San Elijo Lagoon, suspended from the west side of the widened freeway bridge
- Construction of a retaining wall to support a 12-ft-wide paved trail along the south side of the lagoon, within Caltrans right-of-way. Fencing would be provided to prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.
- Connections to new and existing pedestrian-only trails on both sides of the freeway on the south side of the lagoon
- Trail lighting would be provided along Manchester Avenue and on the suspended bridge if compatible with sensitive resources. Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate

Park and Ride Enhancements at Birmingham Drive

This enhancement opportunity includes proposed improvements to the existing park and ride lot located east of I-5 at Birmingham Drive on approximately 0.48 ac. Specific enhancements would include the following aspects:

- Construction of a roundabout at the south end of the lot
- Realignment of the northbound on-ramp
- Reconfiguration of the lot to allow provision of 32 parking spaces
- Provision of sidewalks, a new trailhead for the proposed trail along Villa Cardiff Drive (as described below), and landscaping
- Expansion of opportunities for ridesharing and non-motorized access
- Only plant species native to the local area would be used for any project-related planting

Villa Cardiff Drive Improvements and MacKinnon Bridge Enhancements

This community enhancement opportunity would consist of landscaping and sidewalk/trail connections from Villa Cardiff Drive east of I-5, and from the Hall Property (Encinitas Community Park) west of I-5 across the new MacKinnon Bridge. The approximately 0.6-mi-long and 12-ft-wide trail would pass through an enhanced landscape that would provide screening of the freeway, and would comprise a segment of the previously described regional NC Bike Trail. Specific enhancements would include the following aspects:

- Installation of a combined bike/pedestrian trail and landscaping on the MacKinnon Bridge

- Construction of a 12-ft-wide bike and pedestrian trail on the east side of the freeway along Villa Cardiff Drive, including enhanced planting, and street crossings
- Only plant species native to the local area would be used for any project-related planting
- Provision of improved non-motorized access across the freeway, increased connectivity and community cohesion, and enhanced visual character

Hall Property (Encinitas Community Park) Trail Connecting to Santa Fe Drive

This community enhancement opportunity would provide a 0.66-mi long bicycle/pedestrian connection and associated landscaping between the Hall Property and Santa Fe Drive, west of I-5. This would provide new direct access for bicyclists and pedestrians from the neighborhoods east of I-5 to the park through a landscaped setting. This linear park connection would be located between the proposed freeway on-ramp and parking facilities of the existing commercial lot to the west. Specific enhancements would include the following aspects:

- Construction of a trail from Santa Fe Drive on the west side of I-5, along Caltrans right-of-way, to the edge of the Hall Property
- Improved opportunities for non-motorized access and neighborhood connectivity
- Only plant species native to the local area would be used for any project-related planting

Trail Connecting Santa Fe Drive to Requeza Street with Wetland Enhancement (not biological mitigation)

This community enhancement opportunity would construct a 0.45-mi-long and 12-ft-wide north/south trail connection on the east side of I-5 between Santa Fe Drive on the southern edge and Requeza Street on the north. The enhancement would include drainage improvements and wetland vegetation enhancement, creating a park-like native landscape corridor. The trail connection would be generally located within Caltrans right-of-way, with appropriate planting and grading. This trail connection would allow pedestrians and bike riders to go from Santa Fe Drive to Requeza Street, thereby creating a connection to the trail improvements to the south and north. This would allow residents north of Santa Fe Drive and east of I-5 to readily access to the new Encinitas Community Park (Hall Property). The proposed trail connection would comprise a segment of the previously described regional NC Bike Trail. Specific enhancements would include the following aspects:

- Construction of a12-ft-wide trail on the east side of the I-5 between Santa Fe Drive and Requeza Street
- A bridge to span the wetlands
- Only plant species native to the local area would be used for disturbed areas
- Installation of appropriate drainage improvements and wetland vegetation

Trail Connecting Requeza Street to Encinitas Boulevard

This community enhancement opportunity consists of a 0.78-mi-long and 12-ft-wide trail connecting Requeza Street with Encinitas Boulevard. The trail would be located between the freeway and existing car dealerships and commercial businesses to the east. Impacts to the existing wetlands would be minimized and, where possible, the wetland areas would be enhanced with invasive species removal through the entire drainage. The proposed trail connection also would comprise a segment of the previously described regional NC Bike Trail enhancement. Specific enhancements would include the following aspects:

- Construction of a 12-ft-wide bicycle/pedestrian trail from Encinitas Boulevard to just south of the automobile dealership, where it would connect with an existing unimproved trail that leads to Requeza Street
- Only plant species native to the local area would be used for revegetation
- Installation of native shade tree planting and groundcover along the trail

Union Street Pedestrian Overpass

This enhancement opportunity consists of a pedestrian overpass bridge across I-5, and enhanced landscaping within a 1092-ft-long and 12-ft-wide corridor. The proposed overpass bridge would comprise a segment of the previously described regional NC Bike Trail. Specific enhancements would include the following aspects:

- Enhanced planting along the pedestrian bridge ramp to Union Street Park
- Only plant species native to the local area would be used for any project-related planting
- Design of the bridge to avoid adjacent wetlands
- Provision of improved access opportunities, neighborhood connectivity/cohesion, and non-motorized access options

Cottonwood Creek Park to Union Street Trail Connection with Wetland Enhancement

This enhancement opportunity includes a proposed trail on the west side of I-5 between Encinitas Boulevard and Union Street. The proposed trail would provide a connection between existing open space on Union Street and Cottonwood Creek Park, with wetland enhancement also to be provided in areas adjacent to the 0.25-mi long and 8-ft-wide trail. Specific enhancements would include the following aspects:

- Improved neighborhood and trail connectivity
- Increased opportunities for non-motorized transportation and wetland habitat enhancement
- Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife

City of Carlsbad

Bicycle/Pedestrian Enhanced Trail on the west side of I-5 at Batiquitos Lagoon

This enhancement opportunity consists of a proposed bicycle/pedestrian trail along the west side of I-5 between La Costa Avenue and Avenida Encinas, crossing over Batiquitos Lagoon. In addition, a bridge crossing is proposed under I-5 to connect with lagoon pedestrian trails east of the freeway, as well as to connect the north and south sides of the lagoon. This 1.18-mi-long and 12-ft-wide trail corridor is also a segment of the previously described regional NC Bike Trail enhancement. Specific enhancements would include the following aspects:

- Improved connectivity to existing trail systems currently interrupted by the lagoon and freeway
- Increased access from local communities to coastal areas and the lagoon
- Enhanced opportunities for non-motorized transportation
- A boardwalk and bridge would replace an existing illegal trail across the salt flat and unpermitted bridge over the wetland, thus minimizing impacts associated with uncontrolled use
- A short retaining wall would be constructed within I-5 slopes to eliminate increase in fill otherwise required for trail construction
- Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails, as applicable and consistent with current lagoon practices, to prevent impacts to wildlife using the corridor
- Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.
- Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife

- Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate

Park and Ride Enhancement at La Costa Avenue

This enhancement opportunity involves reconfiguring the existing 3.56-ac park and ride lot adjacent to La Costa Avenue on the east side of I-5 to provide 189 parking spaces, enhancing the associated landscaping and improving an existing maintenance road that provides access to least tern nesting sites. The enhancements would be developed in cooperation with the Batiquitos Lagoon Foundation and the California Department of Fish and Wildlife (previously California Department of Fish and Game). Specific enhancements would include the following aspects:

- Reconfigured park and ride facilities to provide more parking spaces and minimize park and ride expansion
- Only plant species native to the local area would be used for any project-related planting
- Improved opportunities for ridesharing through the provision of additional parking spaces at an existing high use park and ride facility
- Improved access for monitoring/maintenance of least tern nesting areas and lagoon dredging operations
- Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate
- Signage would identify this area as sensitive habitat and include restrictions
- Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.

Bicycle/Pedestrian Enhanced Trail on the East Side of I-5 at Agua Hedionda Lagoon

This enhancement opportunity consists of a proposed bicycle/pedestrian trail along the east side of I-5 between Cannon Road and Chinquapin Avenue, crossing over Agua Hedionda Lagoon. In addition, a new east-west pedestrian bridge and trail crossing is proposed under I-5 along the southern shore of the lagoon. This 1.13-mi-long and 12-ft-wide trail corridor is also a segment of the previously described regional NC Bike Trail enhancement. Specific enhancements would include the following aspects:

- Improved connectivity to existing trail systems currently interrupted by the lagoon and freeway
- Increased access from local communities to coastal areas and the lagoon
- Enhanced opportunities for non-motorized transportation
- Short retaining wall to avoid additional impacts to lagoon
- Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife
- Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate

Streetscape Enhancements on Chestnut Avenue

This community enhancement opportunity consists of pedestrian streetscape enhancements along Chestnut Avenue (between Holiday Park, and Chase Field and Brierly Field) to link Holiday Park with the residential community on the west side of I-5. Specific enhancements would include the following aspects:

- Sidewalks under the freeway on both sides of Chestnut Avenue
- Street trees shading the sidewalk on Chestnut Avenue
- Planting in the parkway to separate pedestrians from traffic

- Widened sidewalks along Chestnut from I-5 to Harding Street
- Colorful, enhanced street and crosswalk paving
- Pedestrian-scale lighting under the bridge, and west along Chestnut

City of Oceanside

Pocket Park and Pedestrian Path at California Street

This 0.26-ac community enhancement involves a proposed pocket park and pedestrian path at California Street east of I-5. The proposed pocket park and pedestrian path, along with related landscaping, lighting, and enhancements to the existing California Street Overcrossing, would implement "safe walk to school" principles and give residents from the Moreno Street neighborhood a much shorter pedestrian route eastward along California Street. A pocket park and other landscaped areas would be reclaimed from land vacated to make room for the I-5 improvements. Specific enhancements would include the following aspects:

- A pocket park between Moreno Way and I-5
- A separate walkway along California Street
- Improved visual character and quality through park creation and landscaping

Oceanside Boulevard Streetscape Enhancement

This 0.7-ac enhancement opportunity involves widening an existing sidewalk and landscape improvements along Oceanside Boulevard under and adjacent to the I-5 overpass, as well as enhanced fencing along the Sprinter tracks. Specific enhancements would include the following aspects:

- Shrubs to help screen and enhance the Sprinter tracks to match proposed landscaping to the east (by City of Oceanside)
- Improved connection to Ron Ortega Recreation Park
- Increased pedestrian separation (with fencing and landscaping) from the Sprinter route
- Enhanced opportunities for non-motorized transportation
- Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife
- Only plant species native to the local area would be used for any project-related planting

Division Street Bicycle/Pedestrian Enhancements

Under this 0.66-ac enhancement, the existing Division Street pedestrian overpass would be widened and enhanced with container planting, street trees, and pavement design. Specific enhancements would include the following aspects:

- Widening of the Division Street Bridge
- Container tree and shrub planting on the bridge
- Enhanced pedestrian paving on the bridge and along Division Street
- Increased opportunities for non-motorized transportation
- Improved visual quality/character and community cohesion
- Enhanced opportunities for non-motorized transportation
- Only plant species native to the local area would be used for any project-related planting

Mission Avenue Bicycle/Pedestrian Enhancements

Under this community enhancement opportunity, the Mission Avenue / I-5 Overcrossing would be improved through widening the sidewalks, realigning ramps to eliminate pedestrian/vehicle conflicts, realigning pedestrian crossing signals, and adding landscaping. These enhancements would occur within a 0.76-mi long (0.77-ac) corridor. Specific enhancements would include the following aspects:

- Realignment of pedestrian signals to eliminate conflict at freeway ramps
- Improved visual quality/character and community cohesion
- Enhanced opportunities for non-motorized transportation

Bush Street Bicycle/Pedestrian Enhancements and Community Gardens

This community enhancement opportunity consists of widening existing sidewalks and adding landscaping within a 0.48-mi-long (1.17-ac) overcrossing corridor. Specific enhancements would include the following aspects:

- Enhanced trail/neighborhood connectivity
- Improved visual character
- Increased opportunities for non-motorized transportation

Community Open Space Park and Gardens

This enhancement would involve development of a 0.285-ac community open space park and/or community garden adjacent to the Family Recovery Center on Horne Street. Two parcels would be acquired for the freeway improvements and would allow for construction of a joint use City park and/or community garden to be used by the Family Recovery Center and the adjacent community. Specific enhancements would include the following aspects:

- Improved visual character
- Increased opportunities for non-motorized transportation

SR-76 Underpass New Parking and Trailhead

This community enhancement opportunity combines a new 51-space parking area, trailhead staging area, and other support amenities for the existing San Luis Rey bike path located on the east side of the I-5 / SR-76 Interchange. In addition, southern willow scrub and coastal sage scrub (CSS) habitat restoration would be implemented at applicable locations between the parking area/trailhead and the San Luis Rey River where the old off-ramp from I-5 would be removed. Specific enhancements would include the following aspects:

- Increased parking capacity for ridesharing
- Improved trail connectivity and visual character/quality
- Additional opportunities for non-motorized transportation
- Creation/restoration of native wetland and upland habitat in place of the ornamental/disturbed habitat between the San Luis Rey River and the trail/park and ride would minimize impacts from trail use and provide a buffer to San Luis Rey River
- Only plant species native to the local area would be used for any project-related planting
- Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife
- Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate
- Signage would identify this area as sensitive habitat and include restrictions

Pedestrian Underpass Improvements north of the San Luis Rey River

This community enhancement would involve a widened sidewalk, ramp connections to meet ADA requirements, improved lighting and planting, and public art features within a 0.1-mi-long corridor. Specific enhancements would include the following aspects:

- Improved coastal access and neighborhood connectivity
- Additional modal access and non-motorized transportation choices

- Provision of improved visual character, quality, and cohesion with addition of landscaping and public art features
- Trail on northern side of river would be constructed mid-slope on the abutment to avoid impacts to habitat near the river and to keep pedestrians further from sensitive habitats and species
- Only plant species native to the local area would be used for any project-related planting
- Signage would identify this area as sensitive habitat and describe prohibitions regarding night use and pets on trails, as applicable and consistent with current lagoon practices, to prevent impacts to wildlife using the corridor
- Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.
- Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife

Harbor Drive/Camp Pendleton Pedestrian and Bicycle Enhancements

This enhancement opportunity involves constructing a 0.35-mi-long and 12-ft-wide pedestrian/bicycle tunnel to avoid the I-5 off-ramps, with this facility also comprising a segment of the previously described regional NC Bike Trail enhancement. Specific enhancements would include the following aspects:

- Provision of ADA-compliant access
- Increased opportunities for non-motorized transportation
- Improved coastal access and neighborhood connectivity
- Additional modal access choices
- Enhanced visual character and quality

2.4 Phased Construction

Phasing of the proposed project has been reviewed and refined following circulation of the Draft EIR/EIS. For construction and funding purposes, the *I-5 NCC Project* would be broken into three stages. These stages would be further subdivided, as appropriate, to allow for construction phasing flexibility. Critical to project scheduling is the overall implementation framework that coordinates the timing of rail, highway, and resource-enhancement project components. Consistent with CA SB 468, this would ensure that I-5 improvements do not outpace other multimodal transportation improvements planned for the I-5 North Coast Corridor, as discussed in *Chapter 1*, *Proposed Project*, and that proposed transportation improvements do not outpace natural resources restoration and enhancement, as detailed in Chapter 6.0 of the project PWP/TREP (Appendix R to this Final EIR/EIS). Wetland and biological impacts would not occur in advance of project mitigation – mitigation would occur prior to or concurrent with these impacts. *Section 3.17* of this document provides detail on phasing of project elements with regard to lagoon crossings and mitigation implementation prior to impact actions. Elements by phase are depicted on *Figures 2-4.1a* through *2-4.1c*.

The current plan anticipates construction beginning as early as 2015, with completion of all project elements by 2035. Over this two-decade period, the following actions are anticipated.

By Year 2020:

- The I-5 segment from Manchester Avenue to SR-78 would be improved to include two HOV/Managed Lanes. This first phase also would include the replacement of the San Elijo Lagoon Bridge, the Batiquitos Lagoon Bridge, and implementation of the Manchester DAR.

- The I-5 segment from La Jolla Village Drive to the I-5 / I-805 merge would be improved to include two HOV/Managed Lanes. This improvement also would include the Voigt DAR and HOV connectors, and the Peñasquitos and Soledad Creek Bridges.

- Community enhancements including the Voigt Drive Overcrossing and realignment improvements; bike/pedestrian trail on both sides of San Elijo Lagoon with a bridge connection to Manchester Avenue; Villa Cardiff and MacKinnon Avenue bridge enhancements; Santa Fe Drive bike/pedestrian improvements; Encinitas Boulevard bike/pedestrian enhancements; and NC Bike Trail San Elijo segment.

- Environmental enhancement actions including continued work on San Elijo Lagoon preservation/enhancement and the ongoing San Dieguito Lagoon W19 Establishment Site; restoration at the Deer Canyon II Establishment Site; new work on planning/restoration at the Hallmark (east and west) sites, Dean Family Trust, and the Batiquitos Bluffs, Laser and La Costa Preservation and Enhancement sites consistent with timing requirements as specified on *Table 3.17.12,* in this Final EIR/EIS.

- Construct soundwalls on private property from Manchester Avenue to SR-78.

By Year 2030:

- I-5 segments from the I-5 / I-805 merge to Palomar Airport Road would be upgraded to include two HOV/Managed Lanes (Express Lanes). In addition, bridge improvements would occur at Carmel Valley Creek and San Dieguito River, along with improvements would be made to the I-5 / SR-56 Interchange.

- Community enhancements including bike/pedestrian trail connections at Old Sorrento Valley Road, north of Del Mar Heights Road, Carmel Valley, Hall Property (Encinitas Community Park), Santa Fe Drive to Requeza Street (with wetland revegetation), Requeza Street to Encinitas Boulevard, Cottonwood Creek Park to Union Street (with wetland revegetation); bike/pedestrian trails adjacent to San Dieguito and Batiquitos Lagoons; Solana Hills Drive trailhead; Union Street pedestrian overpass; Carmel Valley Road, Birmingham Drive, and La Costa Avenue park and rides; Ida Avenue streetscape enhancements; bike/pedestrian improvements at seven overcrossings and five undercrossings; and NC Bike Trail in the Cities of San Diego, Solana Beach, Encinitas, and Carlsbad.

- One environmental enhancement action consisting of preservation and enhancement at Buena Vista Lagoon.

- Construct soundwalls from the I-5 / I-805 merge to Palomar Airport Road.

By Year 2035:

- The I-5 segment from Palomar Airport Road to SR-78 would be upgraded from two to four HOV/Managed Lanes, and I-5 from SR-78 to Harbor Drive (which currently does not have HOV lanes) would be upgraded to include four HOV/Managed Lanes; braided

ramps would be constructed for the I-5 segment from Genesee Avenue to Sorrento Valley Road; bridge improvements would be completed at Agua Hedionda and Buena Vista Lagoons, as well as the San Luis Rey River; and improvements at the I-5 / SR-78 Interchange.

- Community enhancements including bike/pedestrian trail and bridge enhancements at Agua Hedionda Lagoon; pedestrian trail and underpass enhancements north of the San Luis Rey River; bike/pedestrian overpass improvements at Division Street and Mission Avenue; bike/pedestrian improvements at Bush Street and Harbor Drive/Camp Pendleton; SR-76 underpass parking/trailhead staging area; Oceanside Boulevard pedestrian streetscape enhancements; California Street pocket park and pedestrian improvements; community open space and/or community gardens; community gardens at Bush Street; bike/pedestrian improvements at six overcrossings and four undercrossings; and NC Bike Trail in the City of Carlsbad.

- Construct soundwalls from Palomar Airport Road to SR-78, and from SR-78 to Vandegrift Boulevard.

2.5 Decision-Making Process

As detailed above in *Section 2.2*, *Alternatives*, following the Draft EIR/EIS circulation, FHWA and Caltrans have considered all comments and identified a Preferred Alternative in accordance with NEPA and CEQA. This Final EIR/EIS analyzes each alternative at a comparable level to allow meaningful evaluation, analysis, and comparison between alternatives. The Preferred Alternative is used in this Final EIR/EIS to facilitate the development of mitigation measures and concurrent compliance with other applicable environmental laws.

In accordance with CEQA, after circulation of the Final EIR/EIS, Caltrans will prepare findings for all significant impacts identified, prepare a Statement of Overriding Considerations (SOC) for impacts that would not be mitigated below a level of significance, and certify that: the document was completed in compliance with CEQA; the information contained in the final document was considered prior to approving the project; and the document reflects Caltrans' independent judgment and analysis. Caltrans would then file a Notice of Determination (NOD) with the State Clearinghouse, identifying potential significant impacts, mitigation measures included as conditions of project approval, project findings, and notice that an SOC was adopted.

With respect to NEPA, FHWA would verify, as needed, compliance with all federal laws, regulations, and requirements as well as document and explain its decision regarding the selected alternative, project impacts, and mitigation measures in a Record of Decision (ROD) in accordance with NEPA. In accordance with 23 U.S.C. Section 139(l) and Section 1308 of the Moving Ahead for Progress in the 21st Century Act (MAP-21; effective October 1, 2012), a 150-day notice of limitation on claims may be published in the Federal Register once a decision is made on the project.

2.6 Alternatives Considered but Eliminated from Further Discussion Prior to Draft EIR/EIS

2.6.1 Rejected Build Alternatives

Over the last approximately 25 years, various formal and informal studies have been conducted to identify long-range highway improvements to various portions of I-5 within the project area. The North Coast Transportation Study is the MIS, as discussed in *Chapter 1*, and provides the most recent analyses of long-range highway improvement concepts on I-5. The PSR (PDS) was developed in parallel with the MIS, in which Caltrans formally evaluated nine build alternatives and rejected eight alternatives from further consideration; leaving only the "12+2 HOV" (12 general purpose lanes with 2 HOV lanes) and/or "10+2 HOV" (10 general purpose lanes with 2 HOV lanes) alternatives for further study, which were included in the 2000 RTP. Subsequently, criteria were developed through the NEPA 404 process that became the project purpose and objectives.

The MIS alternatives, which screened multiple transportation modes during evaluation of appropriate improvements to North Coast Corridor transportation options, are additionally discussed in Section 5.10 of the PWP/TREP.

Year 2030 (equivalent to 2035) traffic was used to evaluate the nine MIS alternatives. On September 13, 2005, findings from the MIS were presented to the resource agencies. Six of the MIS alternatives showed little improvement in corridor mobility (travel time) and/or congestion relief (reduced lane miles of congestion freeway). The remaining three build alternatives included two "elevated roadway" alternatives and the "2030 8+2 HOV" alternative. Results indicated that HOV demand in the year 2030 would exceed the capacity of a two-lane HOV facility and would not accommodate planned regional transit service.

The following freeway alternatives were rejected due to their inability to provide adequate highway capacity to meet the year 2020 travel demands within the project limits. Therefore, it is anticipated that these alternatives would not maintain or improve traffic levels of service through the year 2030 or 2035.

"Freeway/HOV (8 + 2) Alternative"

This alternative proposed the addition of one HOV lane in each direction between Del Mar Heights Road and Vandegrift Boulevard.

Further analysis was requested by the resource agencies in November 2005. Established growth rates and patterns in the San Diego region indicated the "2030 8+2 HOV" alternative would provide only temporary traffic relief in the corridor. Based again on corridor mobility (travel time) and congestion relief (miles of congested freeway), the "2030 8+2 HOV" alternative would improve peak hour travel time in the general purpose lanes, as well as the HOV lanes, after project completion. Increased future travel demand, however, would cause the existing freeway to fail corridor-wide. The two-lane HOV facility would operate at steady, yet saturated, levels. Travel times and congestion levels on the existing eight-lane freeway would revert back to pre-project conditions approximately 5 to 10 years after project completion.

The inability to provide adequate highway capacity does not maintain or improve traffic operations in the project corridor by design years 2030 or 2035, which does not meet the Overall Project Purpose Statement and objectives as follows:

- Does not maintain or improve the existing and future traffic operations in the project corridor in order to improve the safe and efficient regional movement of people and goods for the planning design year of 2030 or 2035
- Does not maintain or improve future traffic levels of service in 2030 or 2035 over the existing levels of service
- Does not maintain or improve travel times within the corridor
- Does not maintain or improve travel times within the corridor, but rather temporarily provides enough freeway capacity to reduce or maintain travel times on the existing eight-lane freeway for approximately five years. Travel times degrade in ensuing years as travel demand increases
- Does not provide a facility compatible with future BRT and other modal options
- Does not provide consistency with the current RTP
  - Specifically, with one HOV lane operating in each direction and no direct HOV connections, the 8+2 HOV facility cannot accommodate future transit (rapid or otherwise) within the freeway corridor. Peak-hour demand for the one HOV lane would exceed capacity in various segments in year 2015 and worsen in ensuing years. Any type of freeway transit service would operate with considerable delays in the trunkline portion of the route. Transit and freeway operations would also suffer as transit vehicles cross four to five lanes of traffic to access local interchanges.
  - The addition of two HOV lanes does not provide a flexible freeway corridor able to meet forecasted growth in vehicular travel, nor does it support future BRT endeavors. The current RTP (located at the SANDAG website, www.sandag.org) provides guidance to expand freeway systems strategically, while managing and operating freeways safely and efficiently.
- Does not maintain the facility as an effective link in the National Strategic Highway Network
  - The addition of two HOV lanes does not provide enough freeway capacity to address year 2030 or 2035 travel demand. The movement of people and goods to support military operations during peak periods could be compromised by project delays in the existing eight-lane freeway.
- Does not protect and/or enhance the human and natural environment along the I-5 corridor
  - This alternative would require additional outside widening to accommodate auxiliary lanes (in addition to the HOV lane, and the separation between the HOV and the general purpose lanes). Widening would still be required on the lagoon slopes, and the existing bridges spanning the lagoons would still have to be demolished and replaced. This would result in impacts to wetland and upland areas, and travel delays associated with the 8+2 HOV alternative would worsen air quality. Given the minimal right-of-way impacts, the 8+2 HOV alternative does not address existing and future operational deficiencies, it does not improve community connectivity and access at local interchanges and overcrossings, nor does it enhance or improve the existing human and natural environment along the I-5 corridor.

"Freeway Expansion/HOV (10 + 2 HOV) Alternative"

This alternative proposed the addition of one general purpose lane and one HOV lane in each direction between Del Mar Heights Road and Vandegrift Boulevard.

The inability to provide adequate highway capacity does not maintain or improve traffic operations in the project corridor by design years 2030 or 2035, which does not meet the Overall Project Purpose Statement and objectives as follows:

- Does not maintain or improve the existing and future traffic operations in the project corridor in order to improve the safe and efficient regional movement of people and goods for the planning design year of 2030 or 2035
- Does not maintain or improve future traffic levels of service in 2030 or 2035 over the existing levels of service
- Does not maintain or improve travel times within the corridor
- Does not maintain or improve travel times within the corridor, but rather temporarily provides enough freeway capacity to reduce or maintain travel times on the existing eight-lane freeway for approximately five years. Travel times degrade in ensuing years as travel demand increases.
- Does not provide a facility compatible with future BRT and other modal options
- Does not provide consistency with the current RTP
  - Specifically, with one HOV lane operating in each direction and no direct HOV connections, the 10+2 HOV facility cannot accommodate future transit (rapid or otherwise) within the freeway corridor. Peak hour demand for the one HOV lane would exceed capacity in various segments by year 2015 and worsen in ensuing years. Any type of freeway transit service would operate with considerable delays in the trunkline portion of the route. Transit and freeway operations would also suffer as transit vehicles cross four to five lanes of traffic to access local interchanges.
- Does not maintain the facility as an effective link in the National Strategic Highway Network
  - The addition of two HOV lanes does not provide enough freeway capacity to address year 2030 or 2035 travel demand. The movement of people and goods to support military operations during peak periods may be compromised by project delays in the existing eight-lane freeway.
- Does not protect and/or enhance the human and natural environment along the I-5 corridor
  - This alternative would require additional outside widening to accommodate auxiliary lanes (in addition to the HOV lane and the separation between the HOV and the general purpose lanes). Widening would still be required on the lagoon slopes, and the existing bridges spanning the lagoons would still have to be demolished and replaced. This would result in impacts to wetland and upland areas, and travel delays associated with the 10+2 HOV alternative would worsen air quality. Given the minimal right-of-way impacts, the 10+2 HOV alternative does not address existing and future operational deficiencies, it does not improve community connectivity and access at local interchanges and overcrossings, nor does it enhance or improve the existing human and natural environment along the I-5 corridor.

"Freeway Expansion Only (10 + 0) Alternative"

This alternative proposed the addition of one general purpose lane in each direction between Del Mar Heights Road and Vandegrift Boulevard.

The inability to provide adequate highway capacity does not maintain or improve traffic operations in the project corridor by design years 2030 or 2035, which does not meet the Overall Project Purpose Statement and objectives as follows:

- Does not maintain or improve the existing and future traffic operations in the project corridor in order to improve the safe and efficient regional movement of people and goods for the planning design year of 2030 or 2035

- Does not maintain or improve future traffic levels of service in 2030 or 2035 over the existing levels of service
- Does not maintain or improve travel times within the corridor
- Does not maintain or improve travel times within the corridor, but rather temporarily provides enough freeway capacity to reduce or maintain travel times on the existing eight-lane freeway for approximately five years. Travel times degrade in ensuing years as travel demand increases.
- Does not provide a facility compatible with future BRT and other modal options
- Does not provide consistency with the current RTP
- Does not maintain the facility as an effective link in the National Strategic Highway Network
- Does not protect and/or enhance the human and natural environment along the I-5 corridor
    - This alternative would require additional outside widening to accommodate auxiliary lanes (in addition to the HOV lane, and the separation between the HOV and the general purpose lanes). Widening would still be required on the lagoon slopes, and the existing bridges spanning the lagoons would still have to be demolished and replaced. This would result in impacts to wetland and upland areas, and travel delays associated with the 10+0 alternative would worsen air quality. Given the minimal right-of-way impacts, the 10+0 alternative does not address existing and future operational deficiencies, it does not improve community connectivity and access at local interchanges and overcrossings, nor does it enhance or improve the existing human and natural environment along the I-5 corridor.

"Freeway/Managed Lanes (8 + 3 [3+0]) Alternative"

This alternative proposed the addition of three "Managed Lanes" in the median of I-5, with a moveable median barrier that would allow the median lanes to fully reverse travel direction to accommodate peak directional flows.

The inability to provide adequate highway capacity does not maintain or improve traffic operations in the project corridor by design years 2030 or 2035, which does not meet the Overall Project Purpose Statement and objectives as follows:

- Does not maintain or improve the existing and future traffic operations in the project corridor in order to improve the safe and efficient regional movement of people and goods for the planning design year of 2030 or 2035
- Does not maintain or improve future traffic levels of service in 2030 or 2035 over the existing levels of service
- Does not maintain or improve travel times within the corridor
- Does not maintain or improve travel times within the corridor, but rather temporarily provides enough freeway capacity to reduce or maintain travel times on the existing eight-lane freeway for approximately five years. Travel times degrade in ensuing years as travel demand increases.
- Does not maintain the facility as an effective link in the National Strategic Highway Network
- Does not protect and/or enhance the human and natural environment along the I-5 corridor
    - This alternative would require additional outside widening to accommodate auxiliary lanes. Widening would still be required on the lagoon slopes, and the existing bridges spanning the lagoons would still have to be demolished and replaced. This

would result in impacts to wetland and upland areas with travel delays associated with the 8+3 (3+0) alternative would worsen air quality. Given the minimal right-of-way impacts, the 8+3 (3+0) alternative does not address existing and future operational deficiencies, it does not improve community connectivity and access at local interchanges and overcrossings, nor does it enhance or improve the existing human and natural environment along the I-5 corridor.

"Freeway/Managed Lanes (8 + 3 [2 + 1]) Alternative"

This alternative proposed the addition of three "Managed Lanes" in the median of I-5, with a moveable median barrier that would allow the middle lane to reverse travel direction to accommodate peak directional flows.

The inability to provide adequate highway capacity does not maintain or improve traffic operations in the project corridor by design years 2030 or 2035, which does not meet the Overall Project Purpose Statement and objectives as follows:

- Does not maintain or improve the existing and future traffic operations in the project corridor in order to improve the safe and efficient regional movement of people and goods for the planning design year of 2030 or 2035
- Does not maintain or improve future traffic levels of service in 2030 or 2035 over the existing levels of service
- Does not maintain or improve travel times within the corridor
- Does not maintain or improve travel times within the corridor, but rather temporarily provides enough freeway capacity to reduce or maintain travel times on the existing eight-lane freeway for approximately five years. Travel times degrade in ensuing years as travel demand increases.
- Does not protect and/or enhance the human and natural environment along the I-5 corridor
    - This alternative would require additional outside widening to accommodate auxiliary lanes (in addition to the Managed Lanes, and the separation between the HOV and the general purpose lanes). Widening would still be required on the lagoon slopes, and the existing bridges spanning the lagoons would still have to be demolished and replaced. This would result in impacts to wetland and upland with travel delays associated with the 8+3 (2+1) Managed Lanes alternative would worsen air quality. The 8+3 (2+1) Managed Lanes alternative does not address existing and future operational deficiencies, it does not improve community connectivity and access at local interchanges and overcrossings, nor does it enhance or improve the existing human and natural environment along the I-5 corridor.

"Freeway/Managed Lanes (8 + 4 [3+1] Alternative)"

This alternative proposed the addition of four "Managed Lanes" in the median of I-5, with a moveable median barrier that would allow the two center lanes in the median of I-5 to reverse travel direction to accommodate peak directional flows. This lane configuration would allow three lanes to be opened in the peak direction and one lane in the off-peak direction.

The inability to provide adequate highway capacity does not maintain or improve traffic operations in the project corridor by design years 2030 or 2035, which does not meet the Overall Project Purpose Statement and objectives as follows:

- Does not maintain or improve the existing and future traffic operations in the project corridor in order to improve the safe and efficient regional movement of people and goods for the planning design year of 2030 or 2035
- Does not maintain or improve future traffic levels of service in 2030 or 2035 over the existing levels of service
- Does not maintain or improve travel times within the corridor
- Does not maintain or improve travel times within the corridor, but rather temporarily provides enough freeway capacity to reduce or maintain travel times on the existing eight-lane freeway for approximately five years. Travel times degrade in ensuing years as travel demand increases.
- Does not protect and/or enhance the human and natural environment along the I-5 corridor
    - This alternative would require additional outside widening to accommodate auxiliary lanes (in addition to the Managed Lanes, and the separation between the HOV and the general purpose lanes). Widening would still be required on the lagoon slopes, and the existing bridges spanning the lagoons would still have to be demolished and replaced. This would result in impacts to wetland and upland, and travel delays associated with the 8+4 (3+1) Managed Lane alternative would worsen air quality. Given the minimal right-of-way impacts, the 8+4 (3+1) Managed Lane alternative does not address existing and future operational deficiencies, it does not improve community connectivity and access at local interchanges and overcrossings, nor does it enhance or improve the existing human and natural environment along the I-5 corridor.

"Freeway/HOV/Elevated Express Lanes (8+2+4 Elevated) Alternative"

This alternative proposed the addition of two HOV lanes in the median of I-5, along with four elevated express lanes from Del Mar Heights Road to Vandegrift Boulevard. The elevated, limited-access expressway was proposed to operate with either general purpose or Managed Lanes.

The 8+ 2+4 Elevated alternative has high costs along with the potential for substantial adverse impacts to the community and environmental resources, and it does not meet the Overall Project Purpose Statement and objectives as follows:

- Does not provide consistency with the current Regional Transportation Plan
- Does not protect and/or enhance the human and natural environment along the I-5 corridor
    - This alternative would require additional outside widening, including on the lagoon slopes, and the existing bridges spanning the lagoons would still have to be demolished and replaced. This would result in impacts to wetland and upland areas, and travel delays associated with the 8+2+4 Elevated alternative would worsen air quality. Given the minimal right-of-way impacts, the 8+2+4 Elevated alternative does not address existing and future operational deficiencies, it does not improve community connectivity and access at local interchanges and overcrossings, nor does it enhance or improve the existing human and natural environment along the I-5 corridor.

"Freeway/HOV/Elevated Express Lanes (8+2+4 Elevated, 10+2 HOV) Alternative"

This alternative proposed the addition of two HOV lanes in the median of I-5, along with four elevated express lanes from Del Mar Heights Road to Encinitas Boulevard and two additional

general purpose lanes from Encinitas Boulevard to Vandegrift Boulevard. The elevated, limited-access expressway was proposed to operate with either general purpose or Managed Lanes.

The 8+2+4 Elevated, 10+2 HOV alternative has high costs along with the potential for substantial adverse impacts to the community and environmental resources, and it does not meet the Overall Project Purpose Statement and objectives as follows:

- Does not provide consistency with the current RTP
- Does not protect and/or enhance the human and natural environment along the I-5 corridor
    - This alternative would require additional outside widening, including on the lagoon slopes, and the existing bridges spanning the lagoons would still have to be demolished and replaced. This would result in impacts to wetland and upland areas, and travel delays associated with the 8+2+4 Elevated, 10+2 HOV alternative would worsen air quality. The 8+2+4 Elevated, 10+2 HOV alternative does not address existing and future operational deficiencies, it does not improve community connectivity and access at local interchanges and overcrossings, nor does it enhance or improve the existing human and natural environment along the I-5 corridor.

2.7 Permits and Approvals Needed

The following permits, reviews, and approvals would be required for project construction:

Table 2.7.1: Permits and Approvals Needed

Agency	Permit / Approval	Status
U.S. Fish and Wildlife Service (USFWS)*	Endangered Species Act Section 7 Consultation for impacts to Threatened and Endangered Species	Biological Opinion (BO) from USFWS issued on December 31, 2012
U.S. Army Corps of Engineers*	Concurrence on LEDPA	Concurrence on the LEDPA as part of NEPA/404 received on July 15, 2013.
	Clean Water Act (CWA) Section 404 and Rivers and Harbors Act Section 10 Standard Individual Permit for Discharging Dredged or Fill Material in Waters of the U.S.; and for structures and work in, over, and/or under navigable waters, respectively	CWA Section 404 anticipated submittal spring 2014 (post PWP/TREP finalization and after Federal Consistency is determined)
	Marine Protection Research and Sanctuaries Act of 1972 Section 103 Permit for deposit of sediment into the ocean	Section 103 Permit anticipated submittal spring 2014 (post PWP/TREP finalization and after Federal Consistency is determined)
	Rivers and Harbors Act Section 408 Permit for Federally Designed, Constructed, and Operated Structures	Section 408 Permit must be approved prior to CWA Section 404 Permit approval (San Luis Rey River)
National Oceanic and Atmospheric Administration/National Marine Fisheries Service*	Informal consultation with NMFS	Final consultation approved May 16, 2013
	Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Coordination	Coordination completed January 3, 2013
California Department of Fish and Wildlife*	California Fish and Game Code (FGC) Section 1602 Agreement for Streambed Alteration	Section 1602 Agreement anticipated submittal spring 2014 (post PWP/TREP finalization and after Federal Consistency is determined)
Regional Water Quality Control Board – Region 9*	CWA Section 401 Certification	Section 401 Certification anticipated submittal spring 2014 (post PWP/TREP finalization and after Federal Consistency is determined)

Table 2.7.1 (cont.): Permits and Approvals Needed

Agency	Permit / Approval	Status
California Coastal Commission*	Coastal Zone Management Act (CZMA) Federal Consistency Certification Coastal Development Permit(s) (CDPs) for areas of retained jurisdiction Local Coastal Program (LCP) Amendments Public Works Plan (PWP) Approval	CZMA Federal Consistency Certification anticipated spring 2014 PWP/TREP Approval spring 2014 LCP Amendments and PWP Approval anticipated spring 2014
California Transportation Commission	Funds Appropriation and New Freeway Access	Funds Appropriation and New Freeway Access anticipated spring 2014
California Public Utilities Commission	Utility Construction Permit Request	Utility Construction Permit submittal anticipated fall 2013
Metropolitan Transit System (MTS)	Construction and Maintenance Agreements for Sorrento Valley Overhead	Construction and Maintenance Agreements will be finalized after California Transportation Commission (CTC) approval
North County Transit District (NCTD)	Construction and Maintenance Agreements for Oceanside Overhead	Construction and Maintenance Agreements will be finalized after CTC approval
City of San Diego	Freeway Agreement for Voigt Drive DAR	Freeway Agreement will be finalized after CTC approval
City of Encinitas	Freeway Agreement for Manchester Avenue DAR	Freeway Agreement will be finalized after CTC approval
City of Oceanside	Freeway Agreement for Mission Avenue Freeway Agreement for Harbor Drive Revise Freeway Agreements for SR-76 and SR-78	Freeway Agreement will be finalized after CTC approval Freeway Agreement will be finalized after CTC approval Freeway Agreement will be finalized after CTC approval

* This federal and/or State agency has participated in the NEPA 404 process

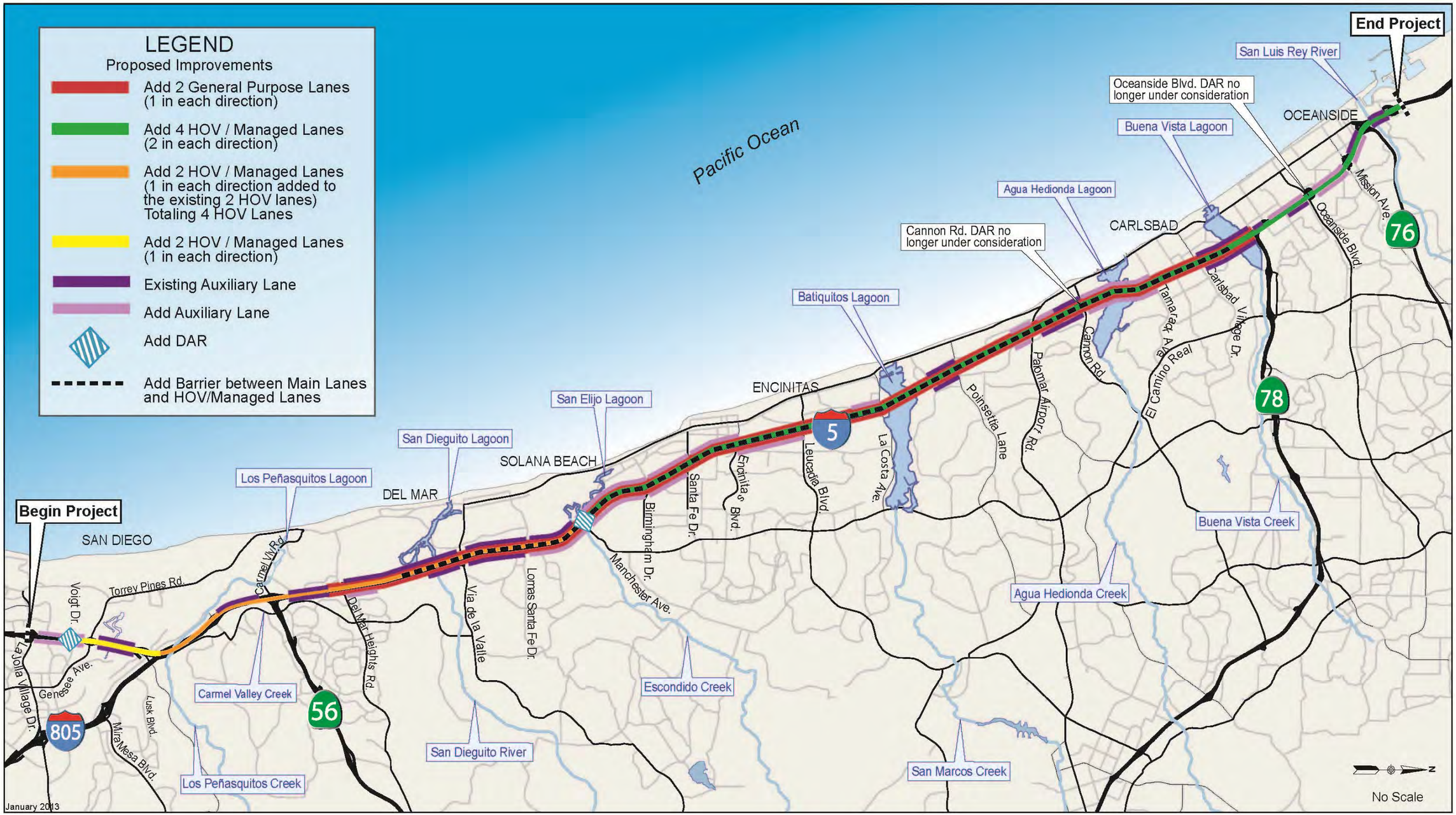


Figure 2-2.1a: Schematic for 10+4 Barrier Alternative

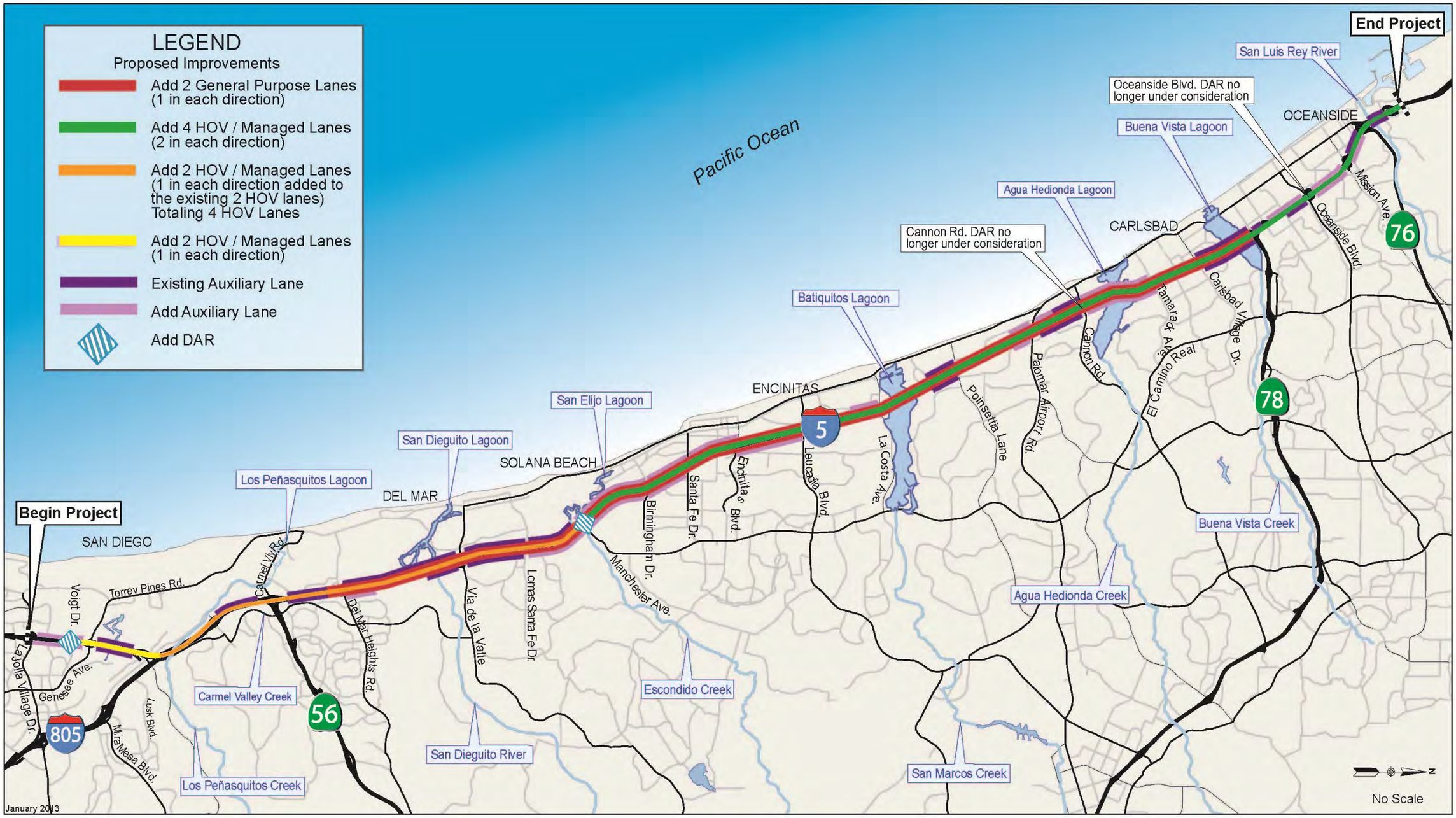


Figure 2-2.1b: Schematic for 10+4 Buffer Alternative

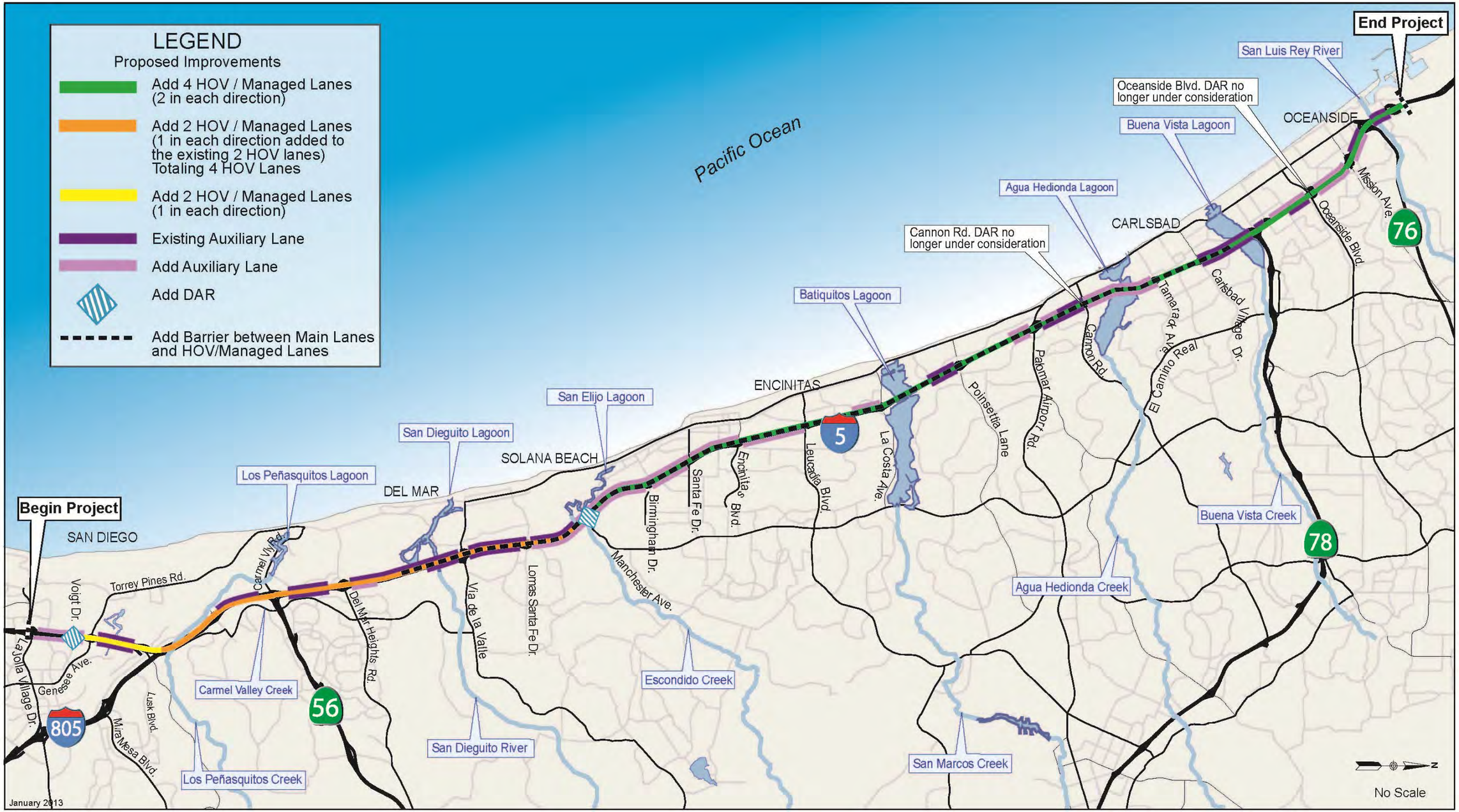


Figure 2-2.1c: Schematic for 8+4 Barrier Alternative

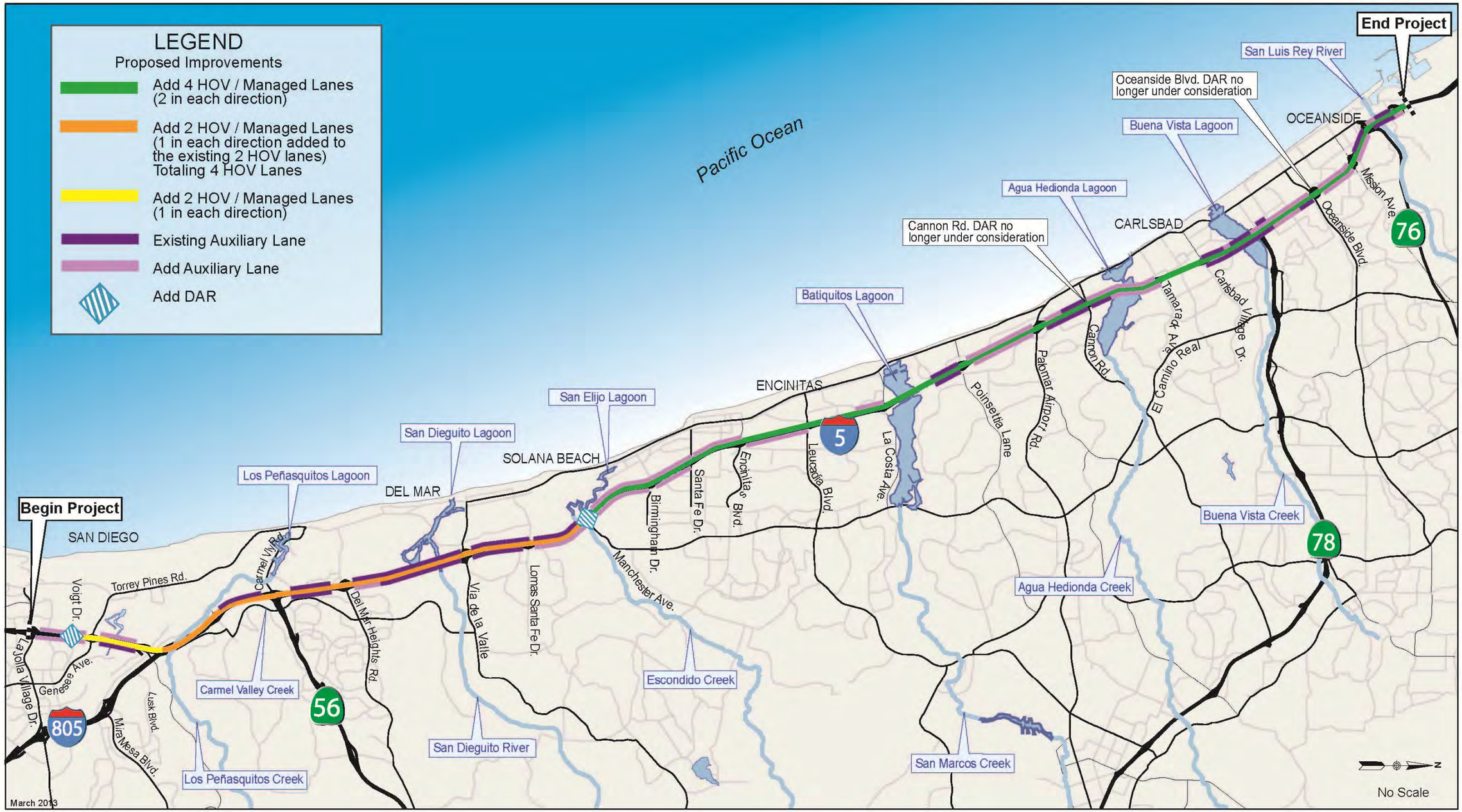


Figure 2-2.1d: Schematic for 8+4 Buffer Alternative (Preferred Alternative)

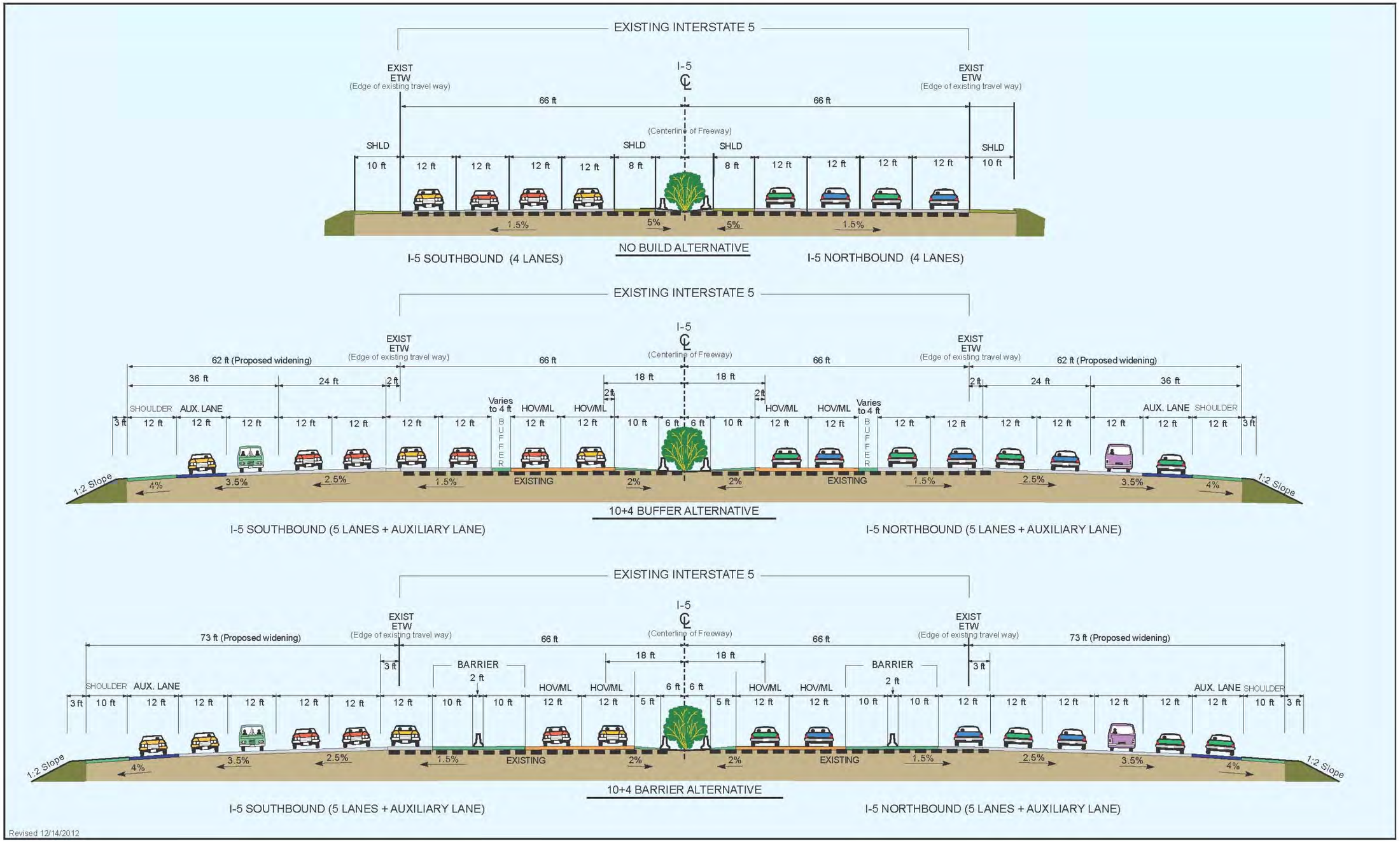


Figure 2-2.2a: Cross-sections for 10+4 Barrier and Buffer Alternatives

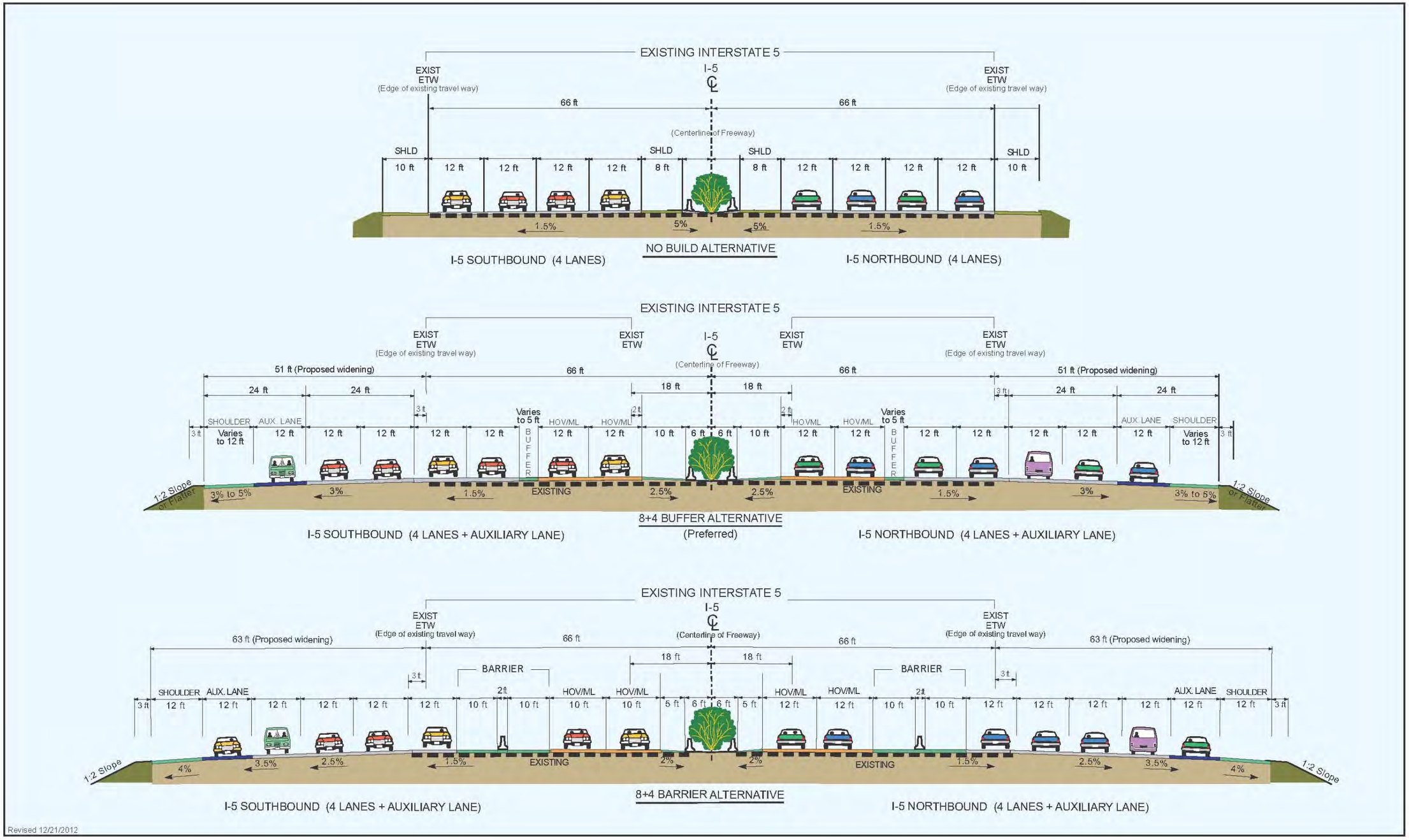


Figure 2-2.2b: Cross-sections for 8+4 Barrier Alternative and 8+4 Buffer Alternative (Preferred Alternative)

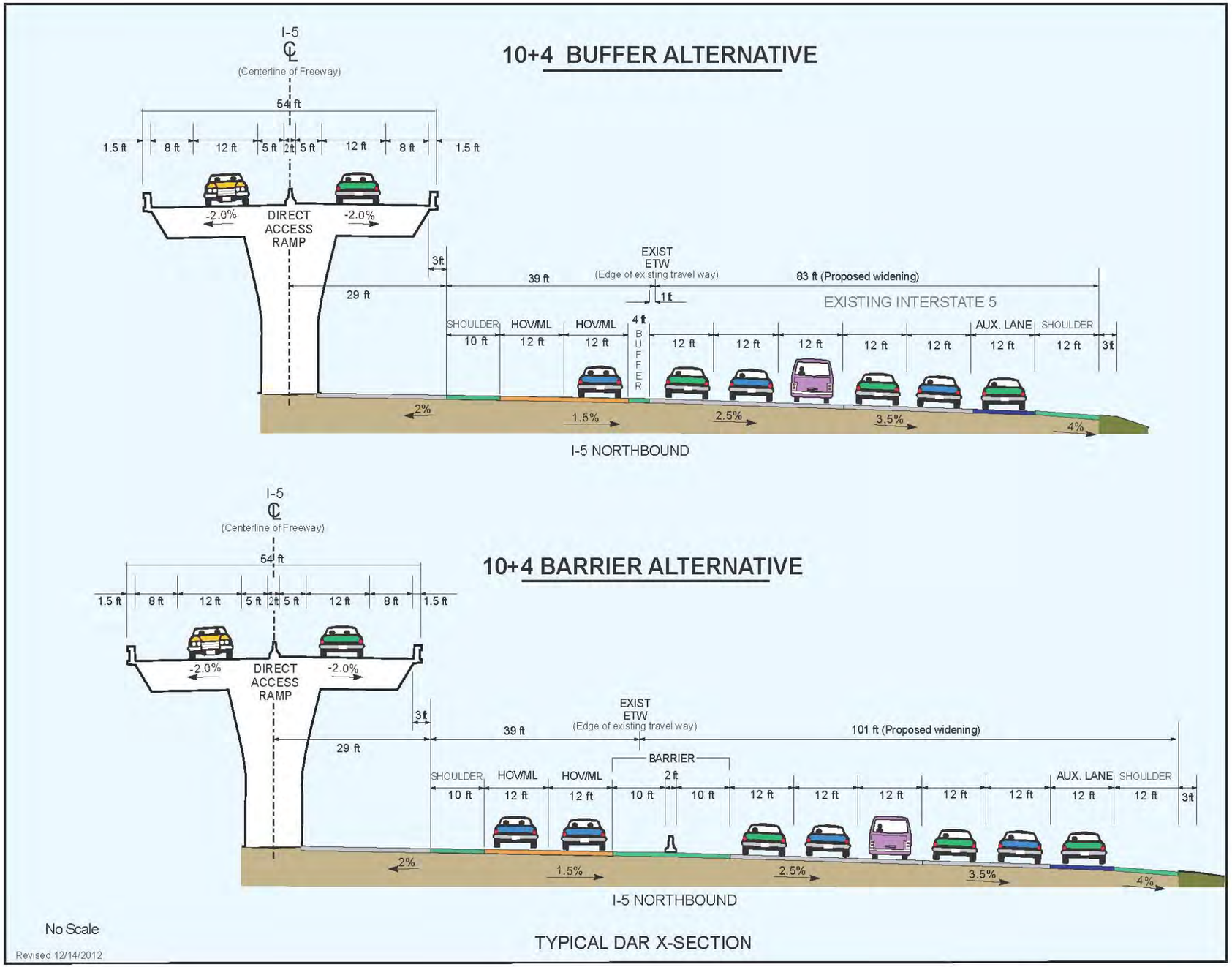


Figure 2-2.2c: Cross-sections for DAR for 10+4 Barrier and Buffer Alternatives

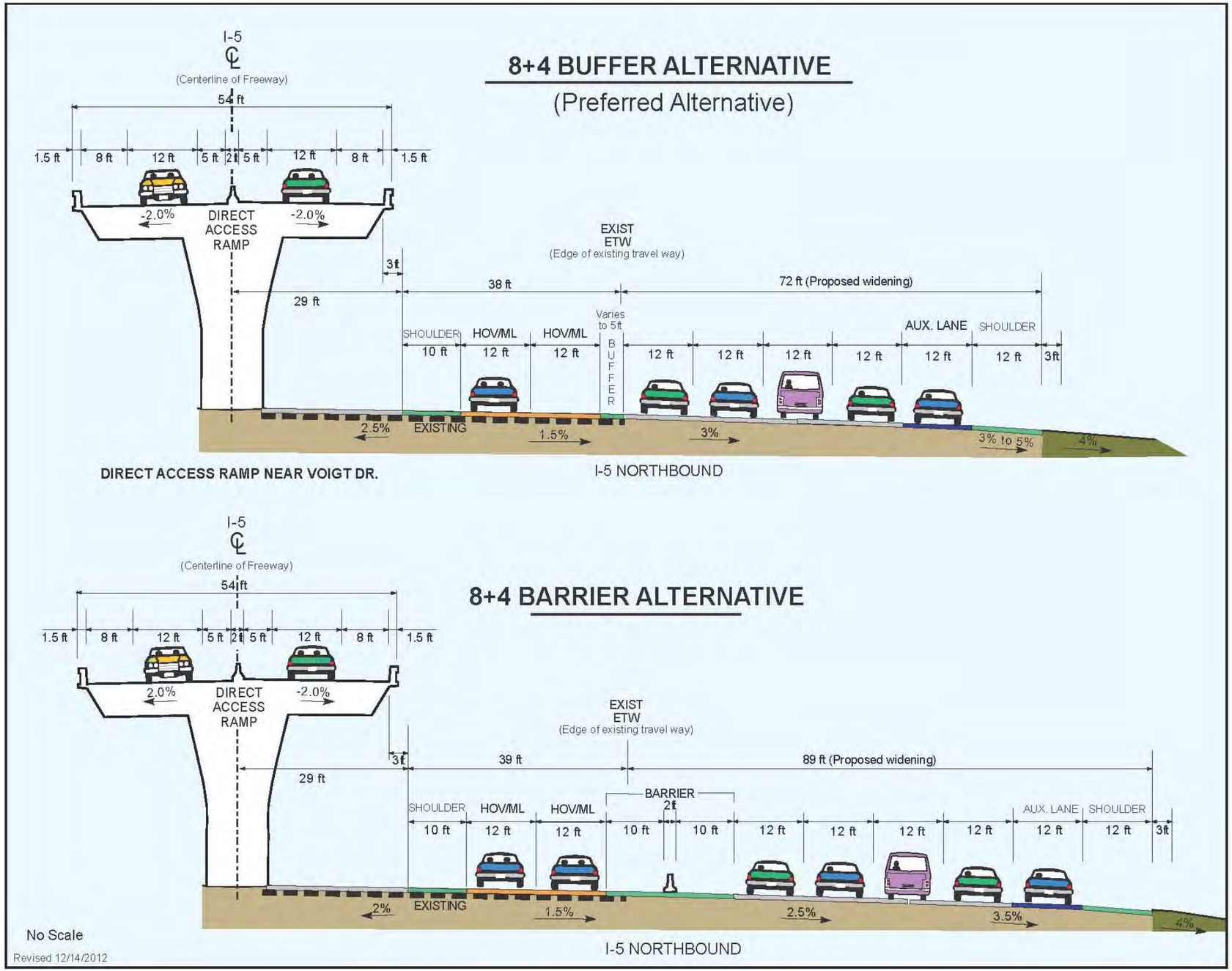


Figure 2-2.2d: Cross-section with DAR for 8+4 Barrier and 8+4 Buffer Alternative (Preferred Alternative)

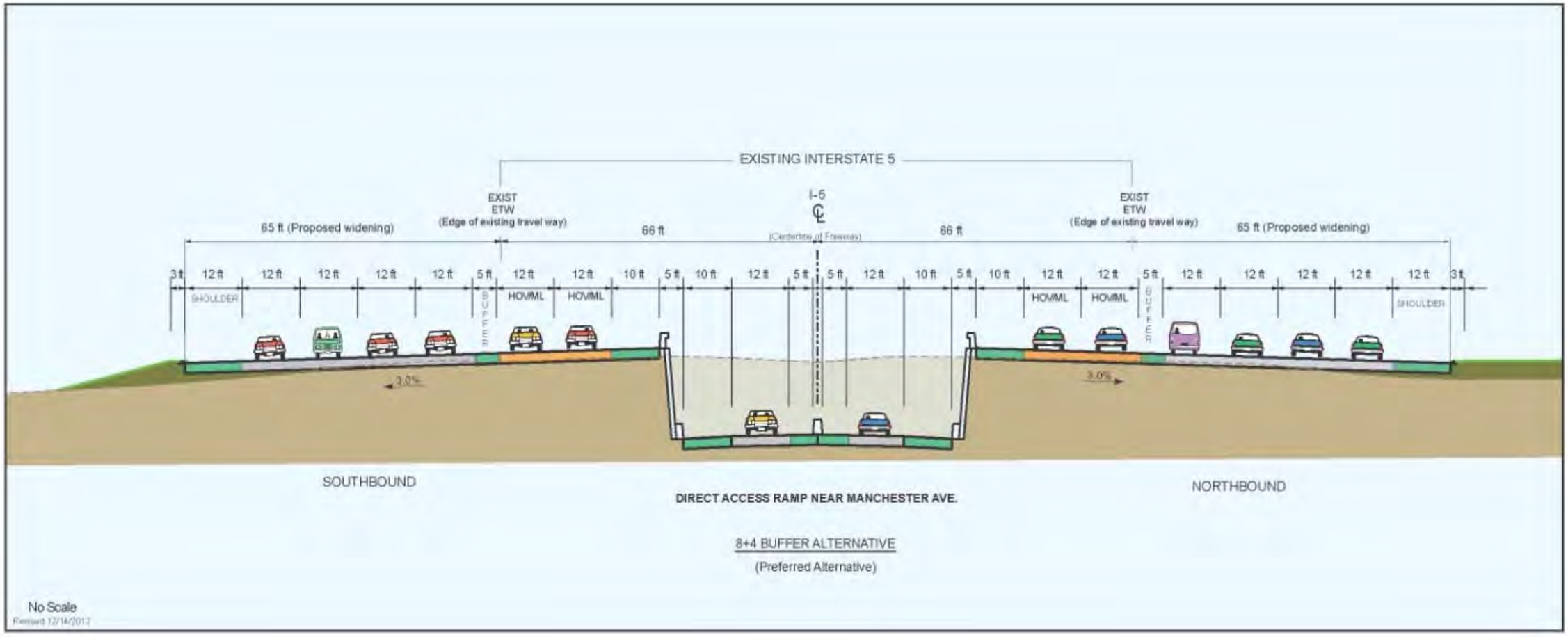


Figure 2-2.2e: Cross-section with DAR for 8+4 Barrier and 8+4 Buffer Alternative (Preferred Alternative) at Manchester Avenue

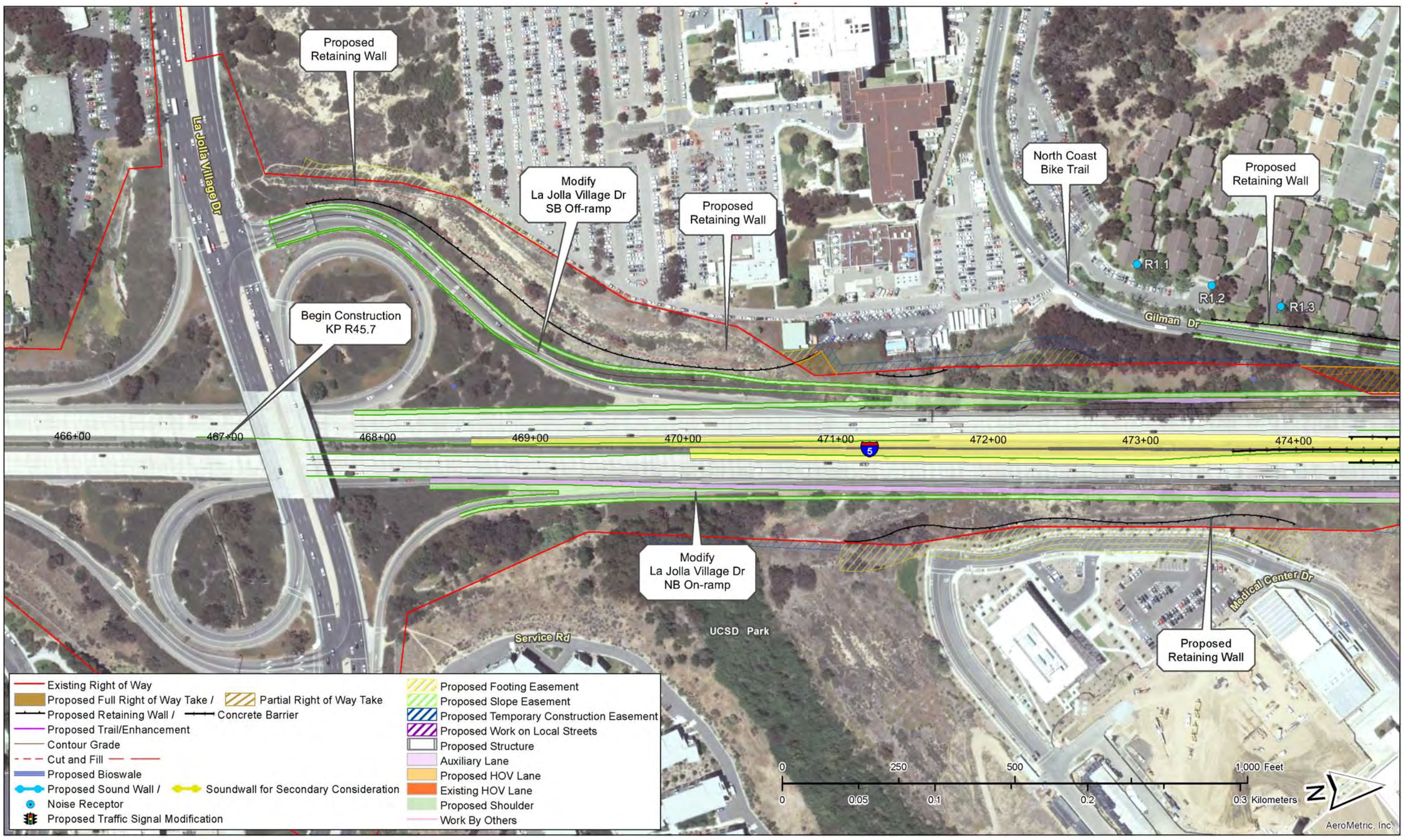


Figure 2-2.3, Sheet 1 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

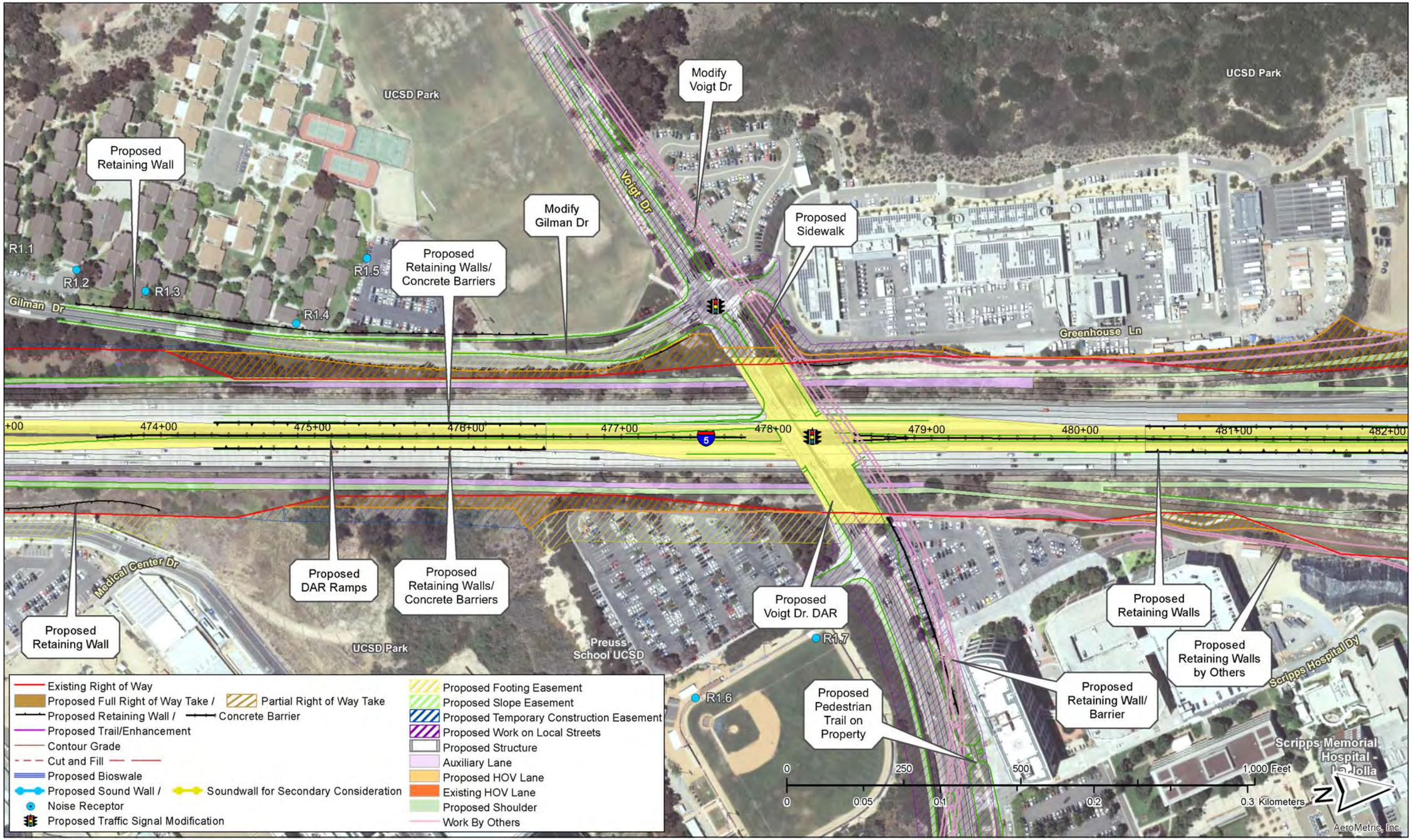


Figure 2-2.3, Sheet 2 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

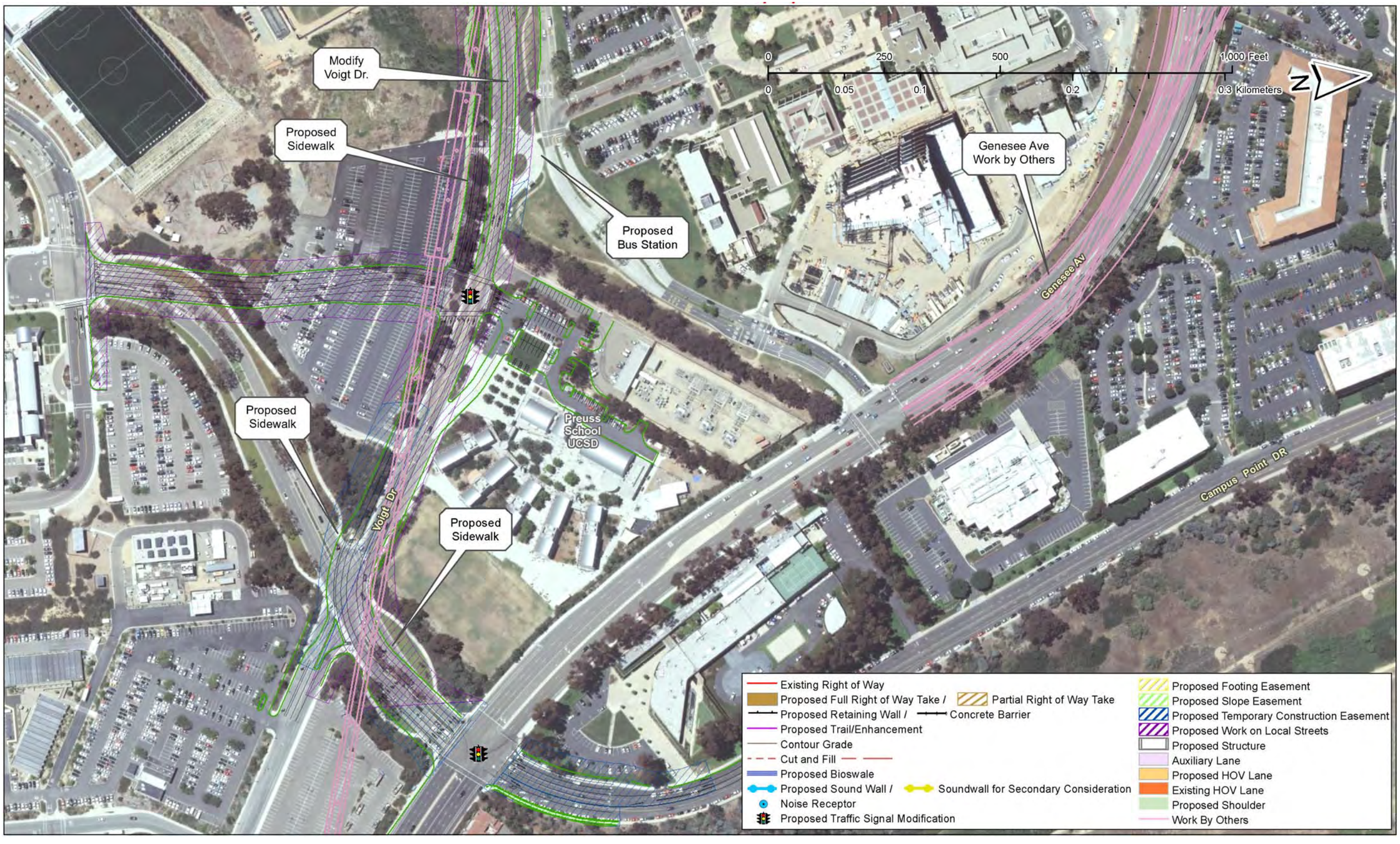


Figure 2-2.3, Sheet 3 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

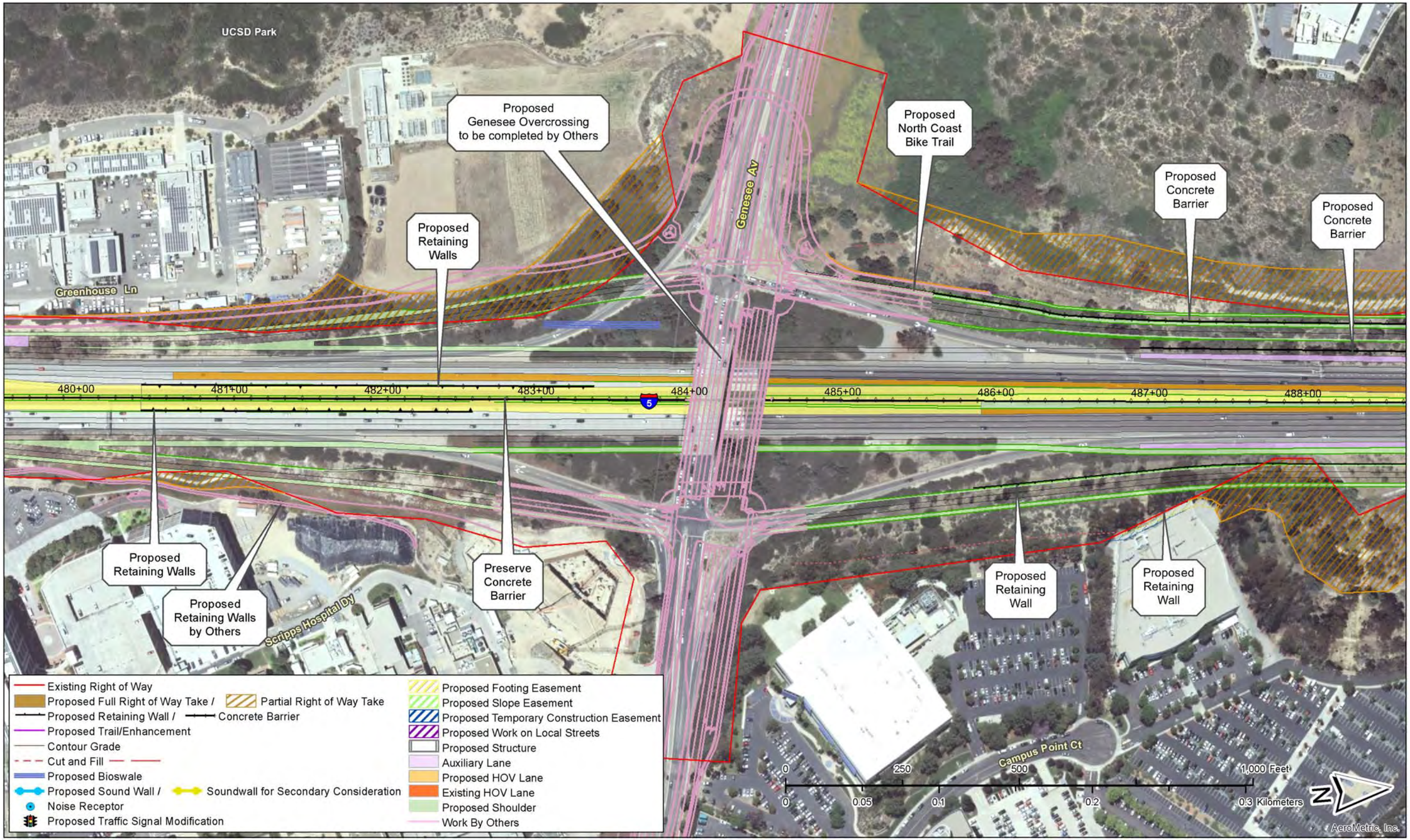


Figure 2-2.3, Sheet 4 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

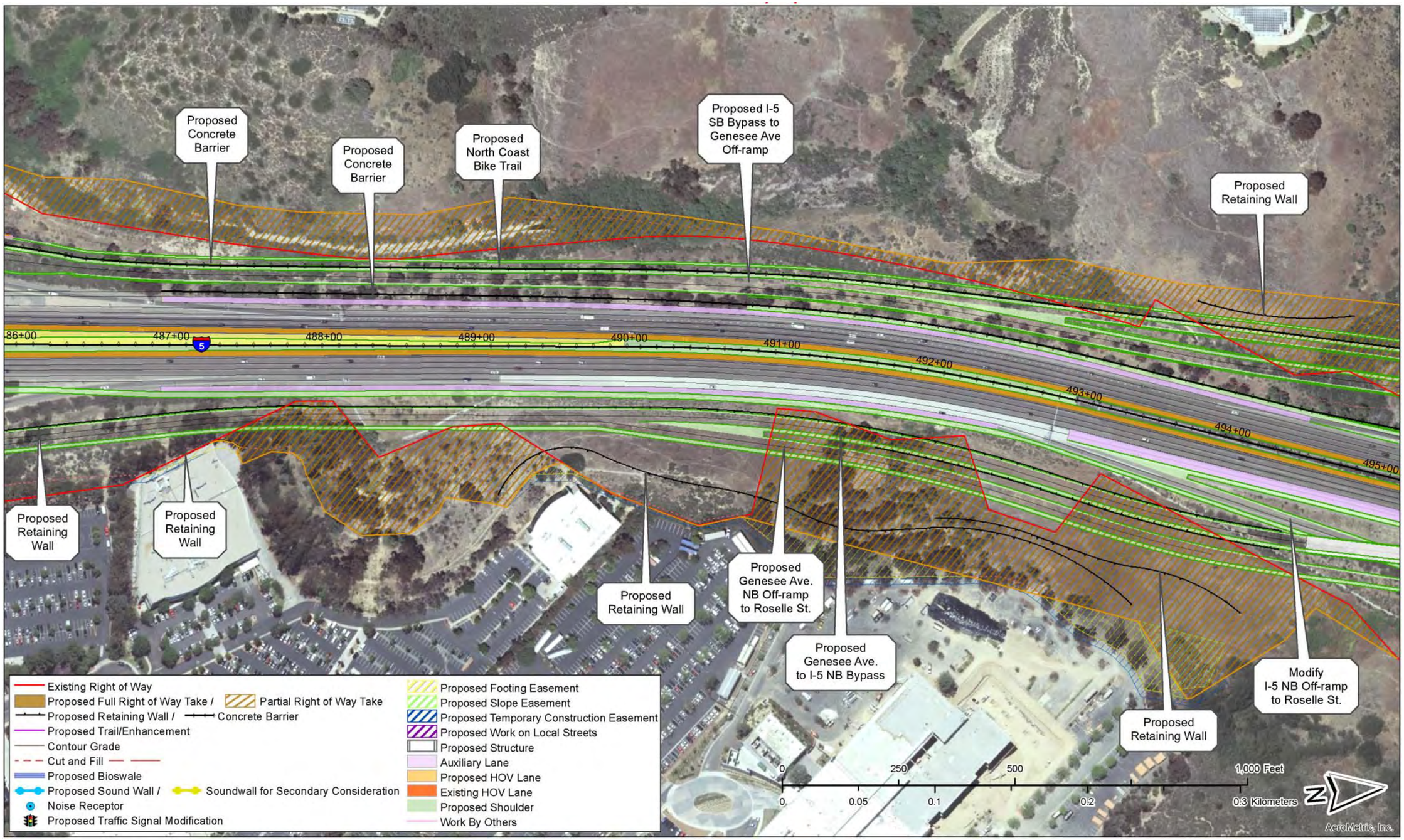


Figure 2-2.3, Sheet 5 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

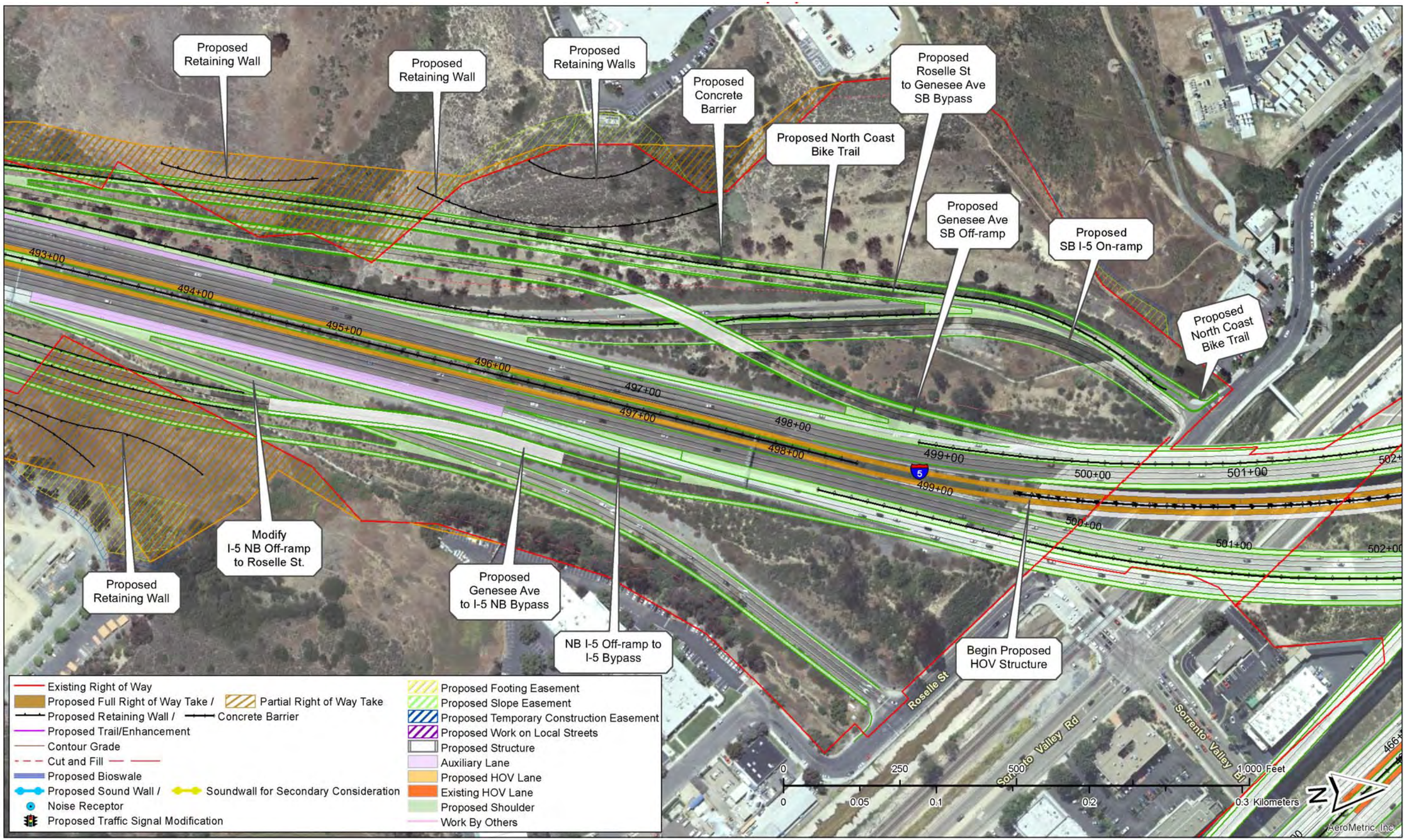


Figure 2-2.3, Sheet 6 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

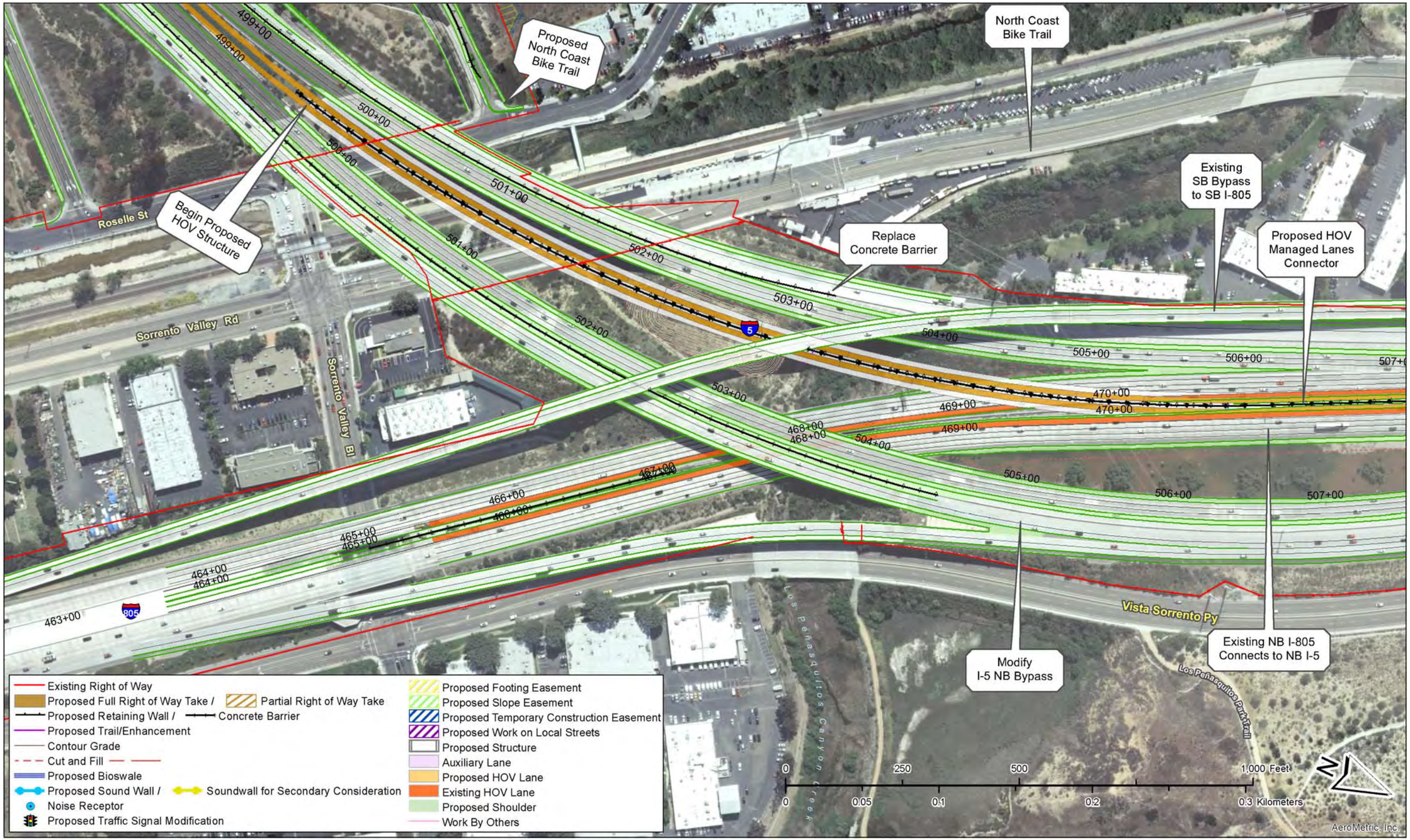


Figure 2-2.3, Sheet 7 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

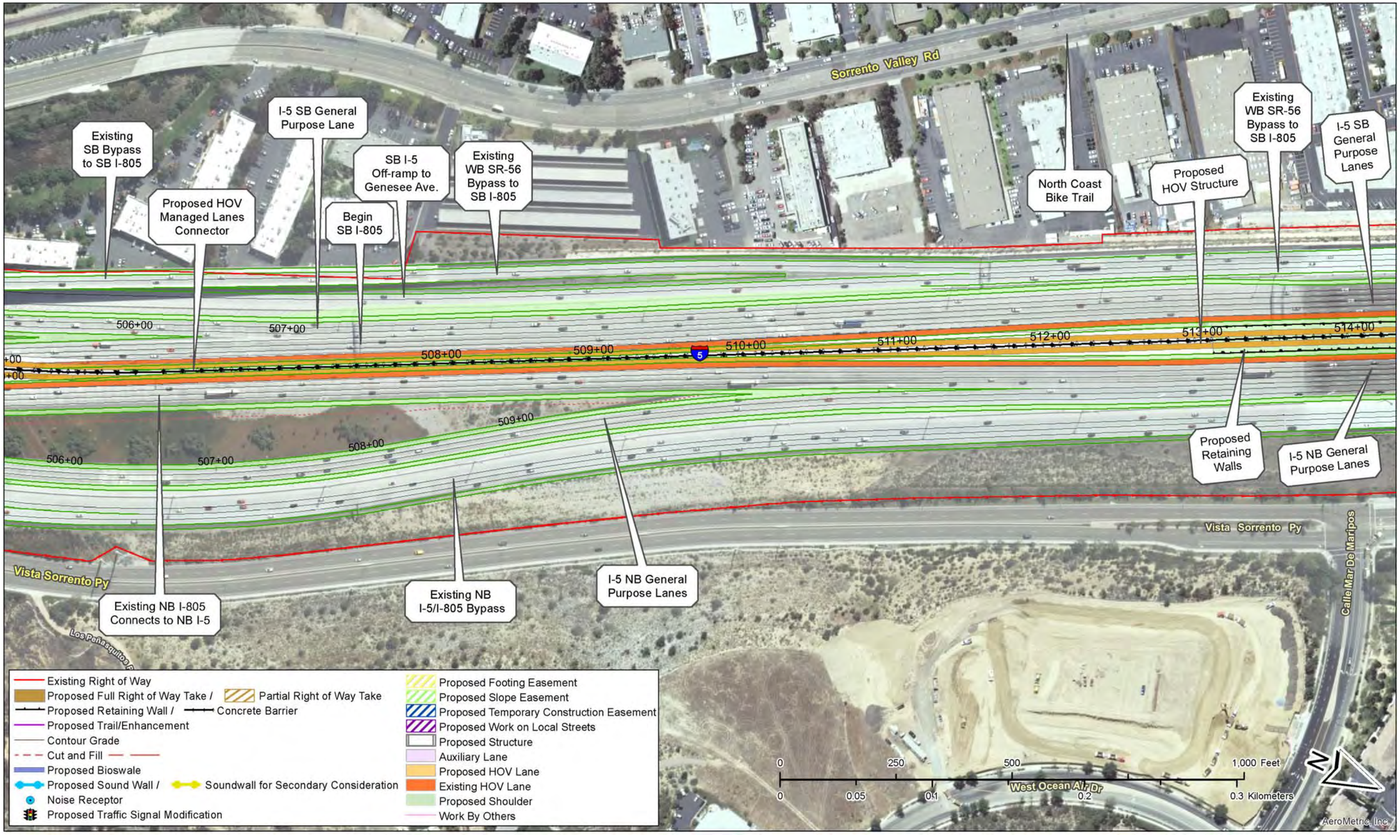


Figure 2-2.3, Sheet 8 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

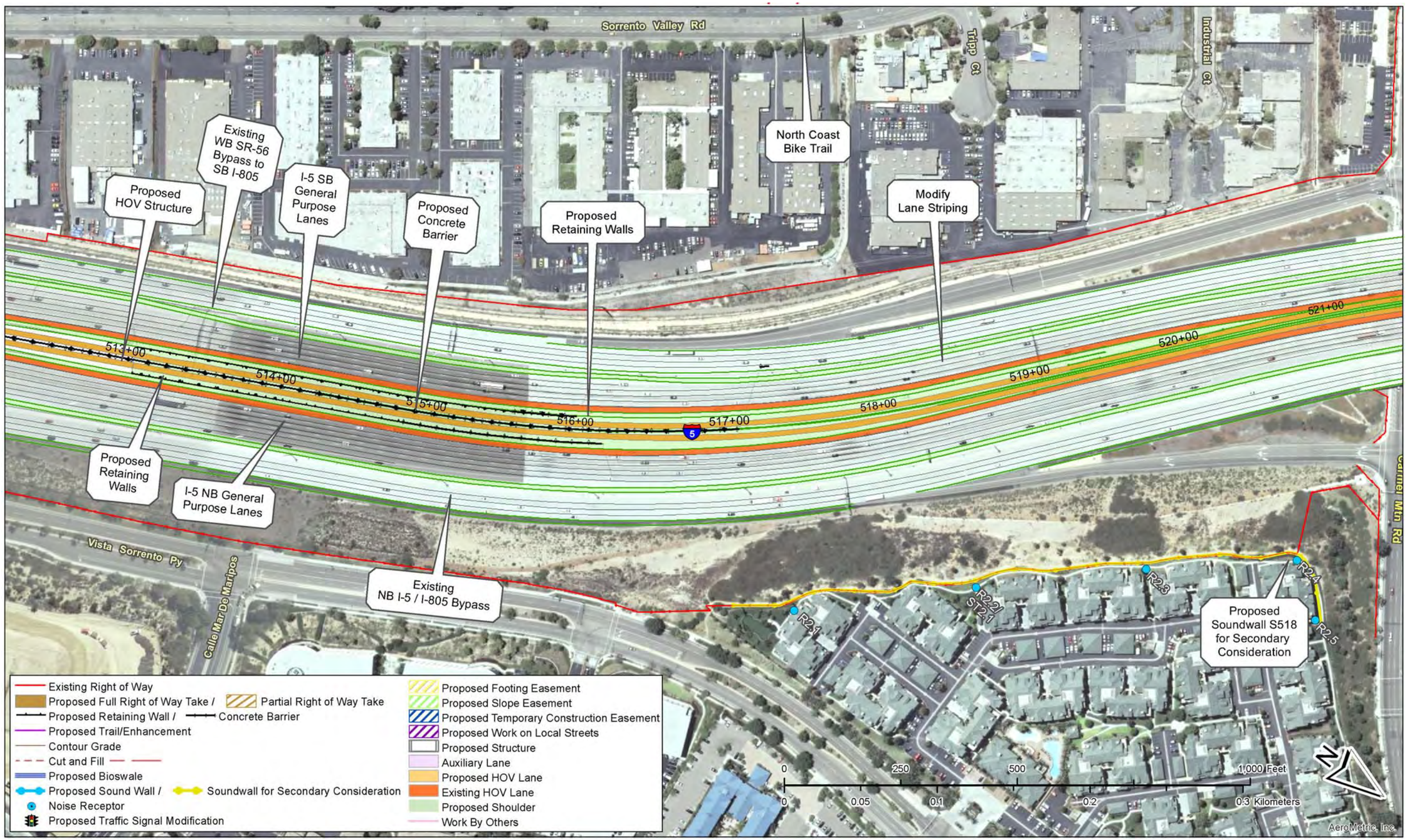


Figure 2-2.3, Sheet 9 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

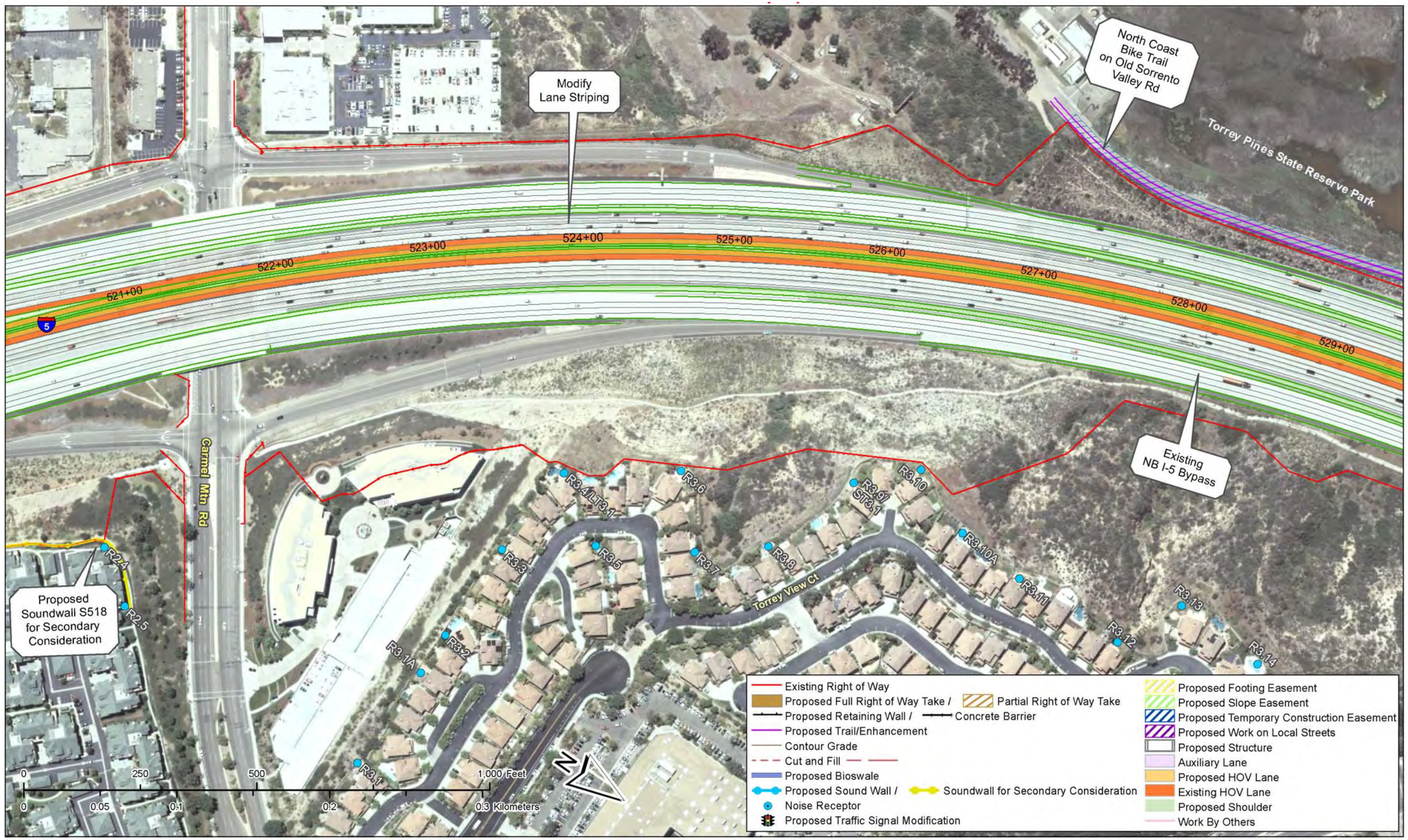


Figure 2-2.3, Sheet 10 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

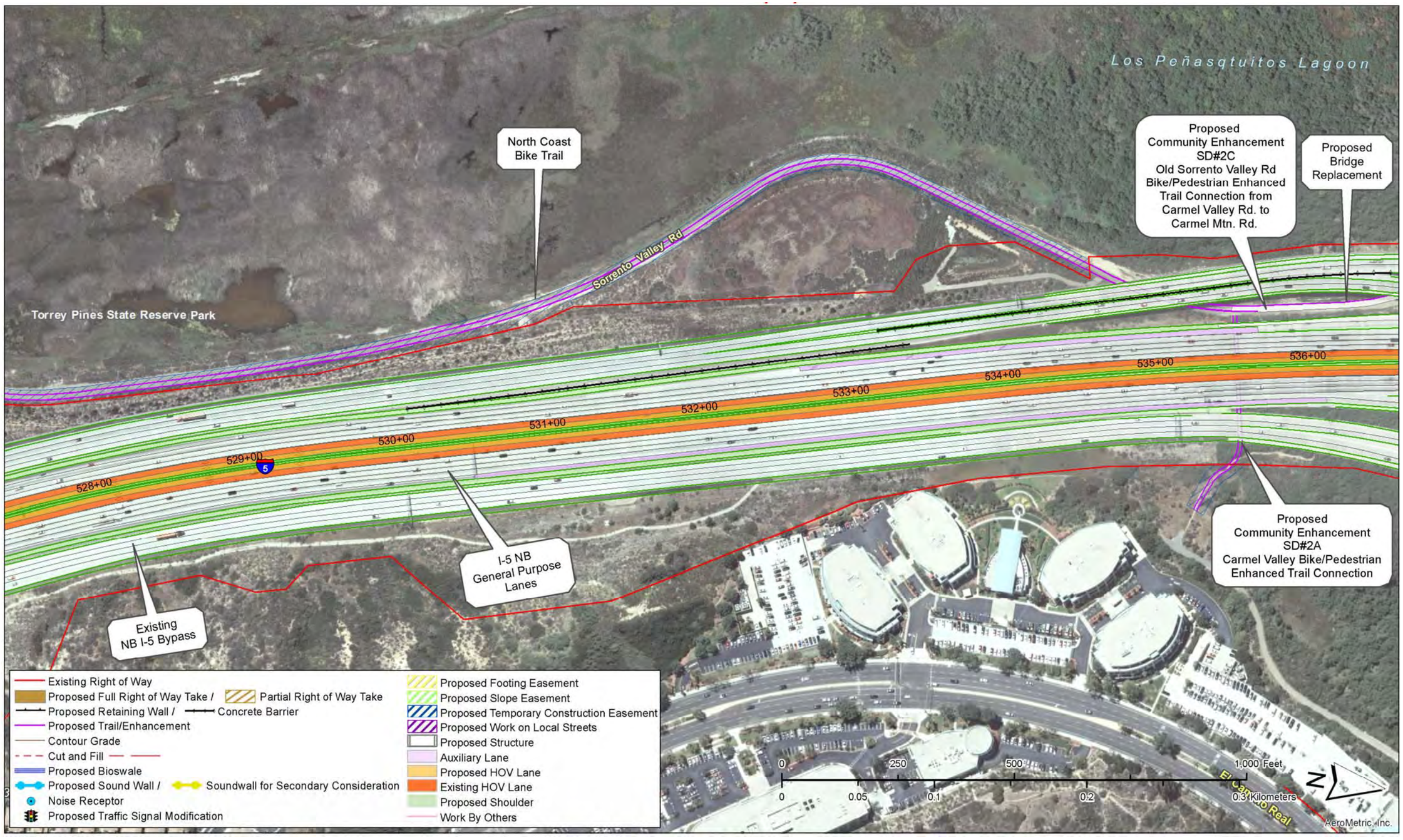


Figure 2-2.3, Sheet 11 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

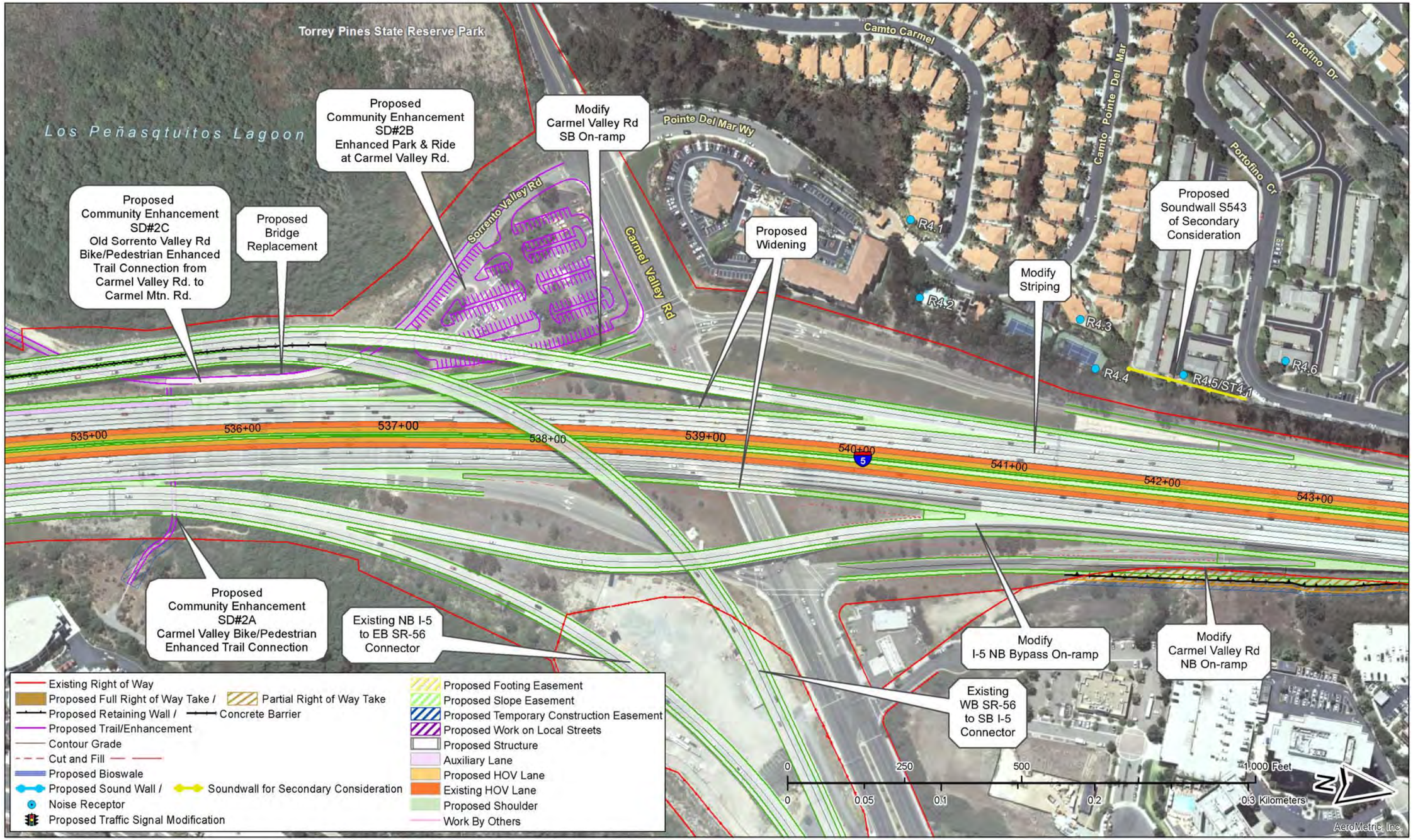


Figure 2-2.3, Sheet 12 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

Figure 2-2.3, Sheet 13 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

Figure 2-2.3, Sheet 14 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

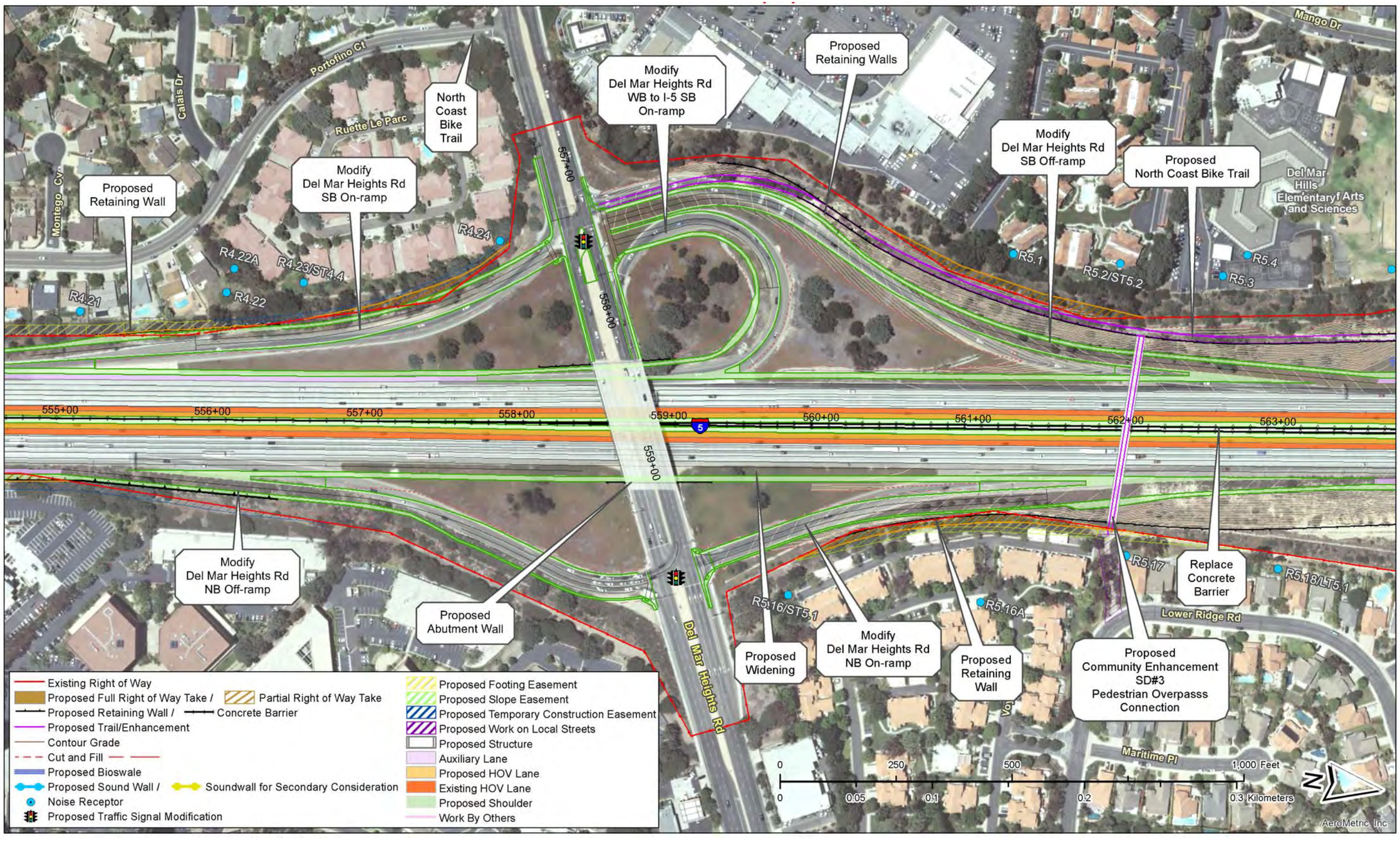


Figure 2-2.3, Sheet 15 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

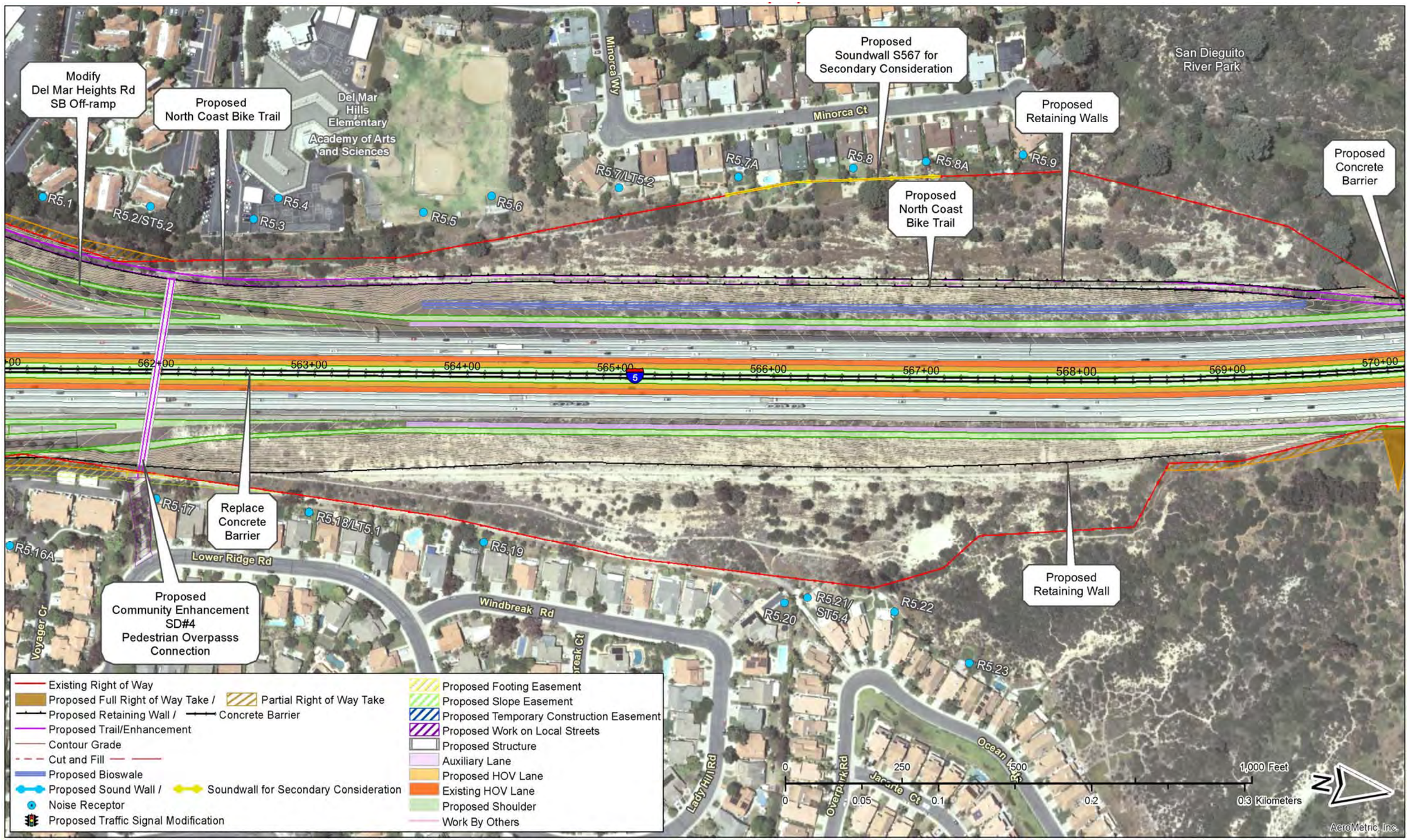


Figure 2-2.3, Sheet 16 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

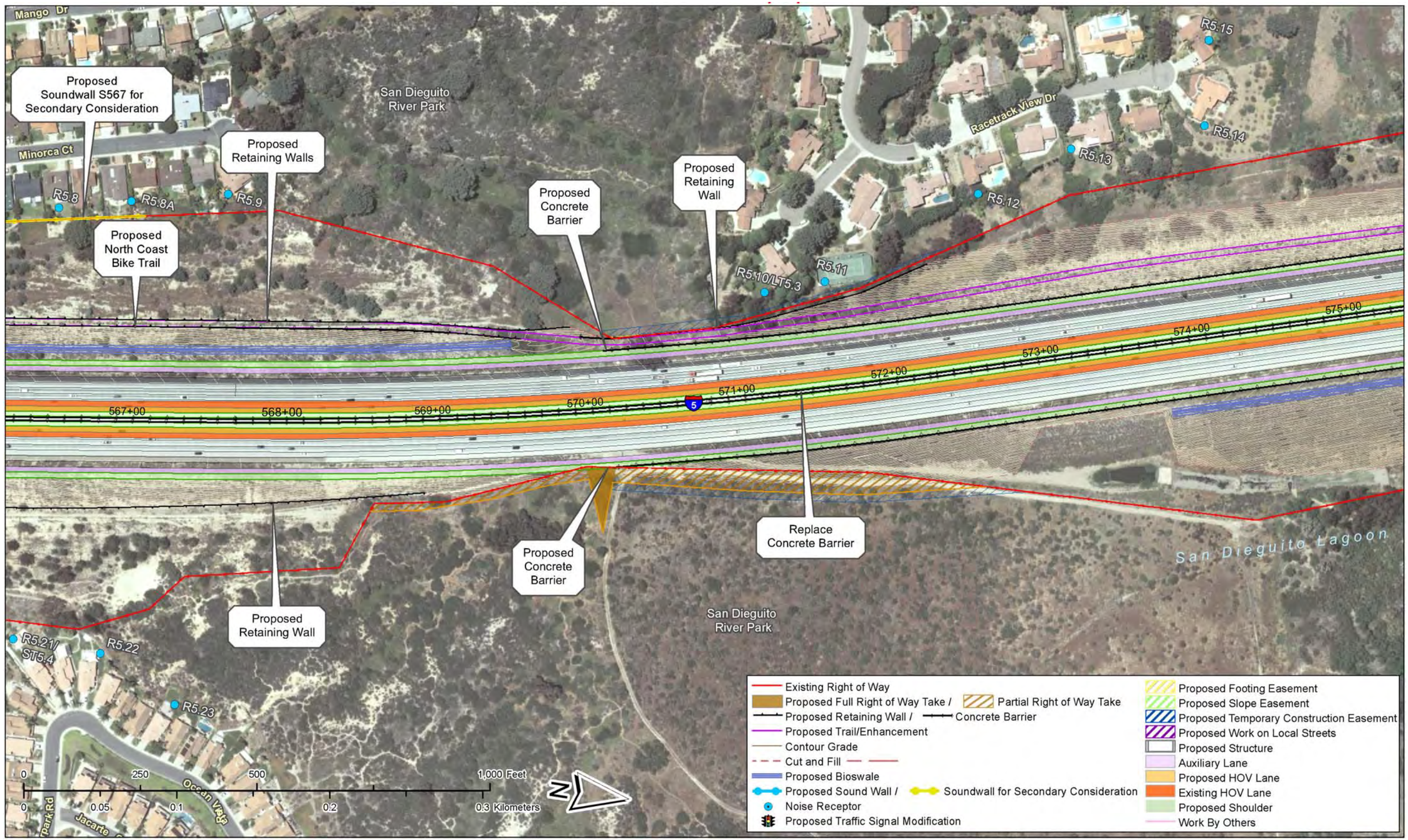


Figure 2-2.3, Sheet 17 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

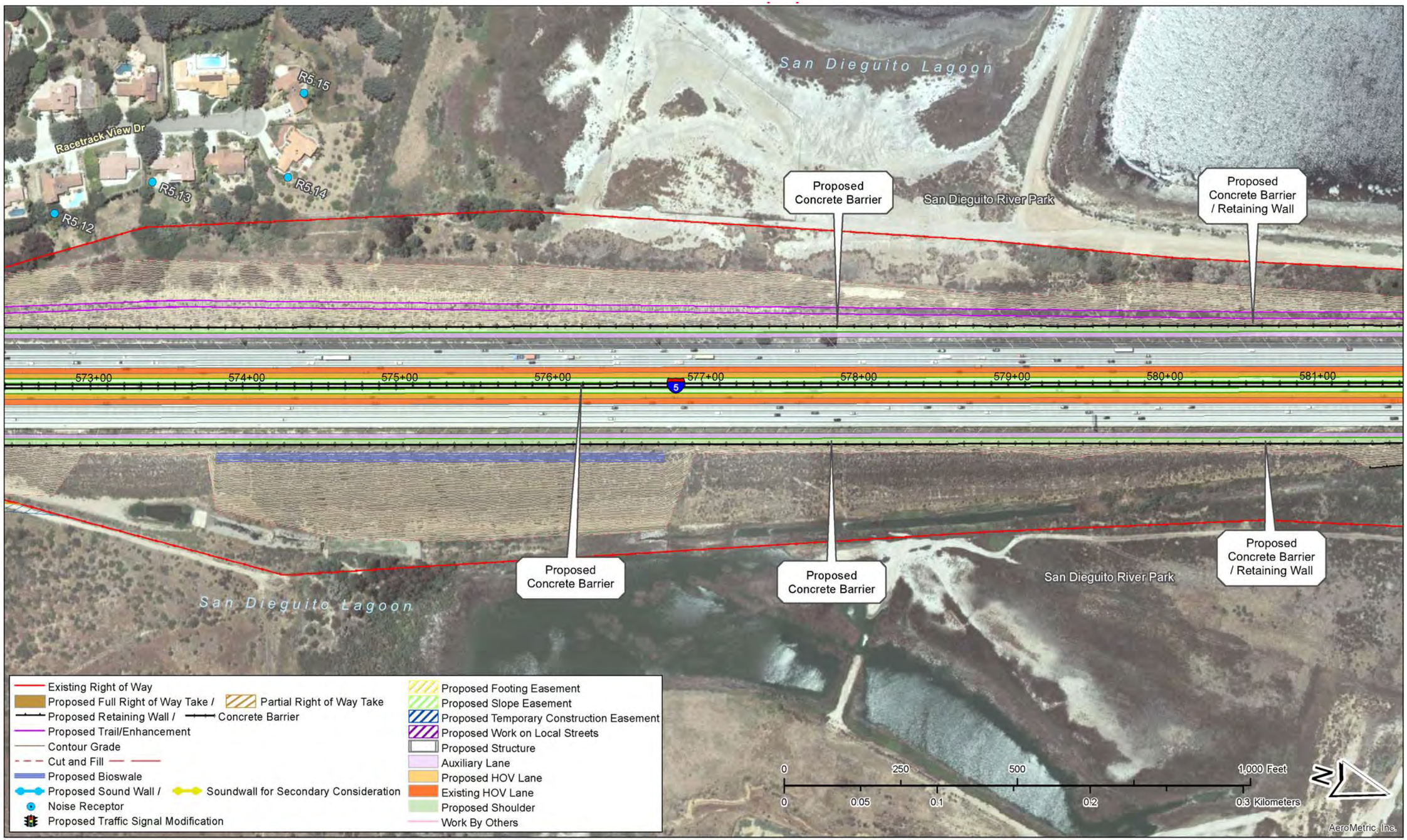


Figure 2-2.3, Sheet 18 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

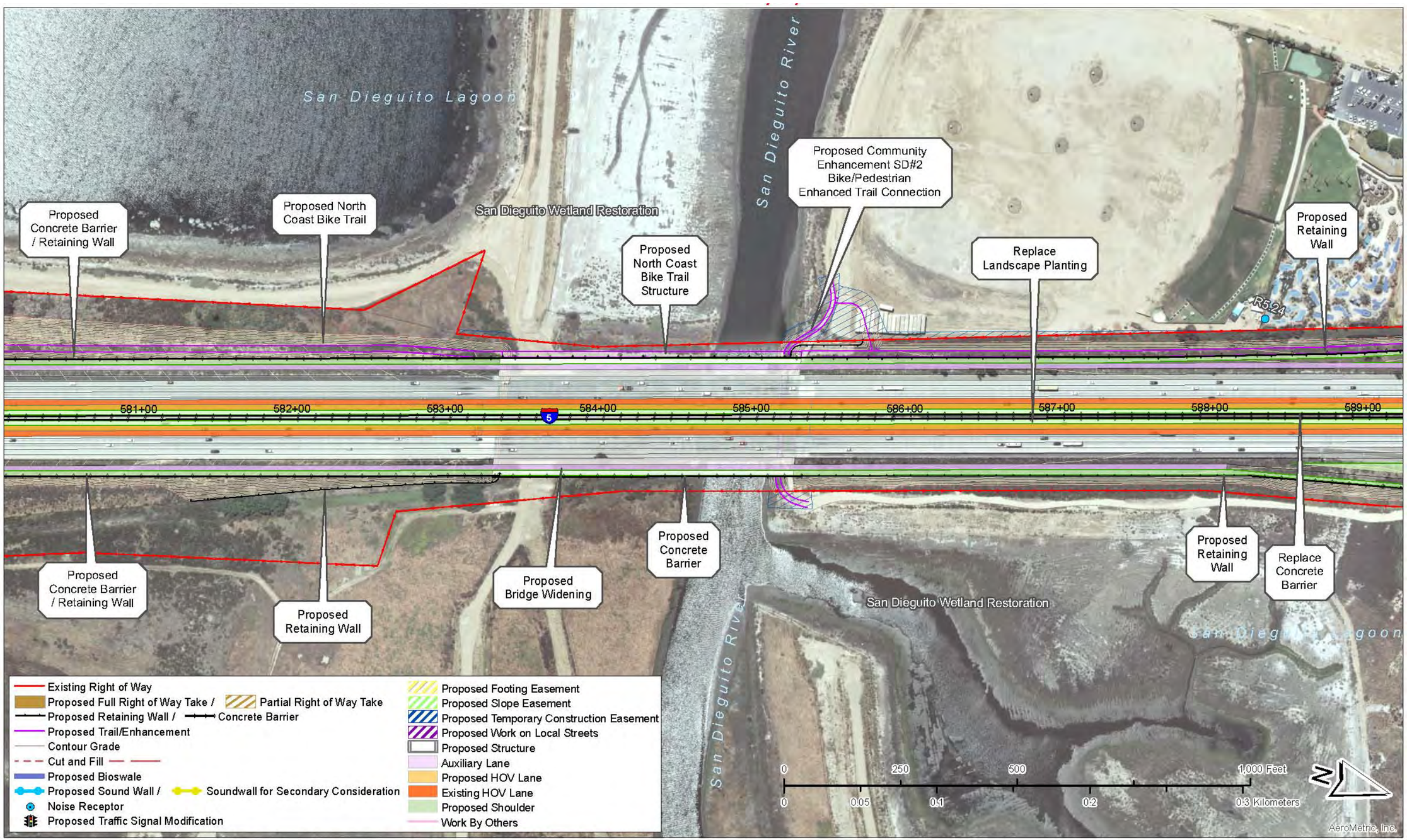


Figure 2-2.3, Sheet 19 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

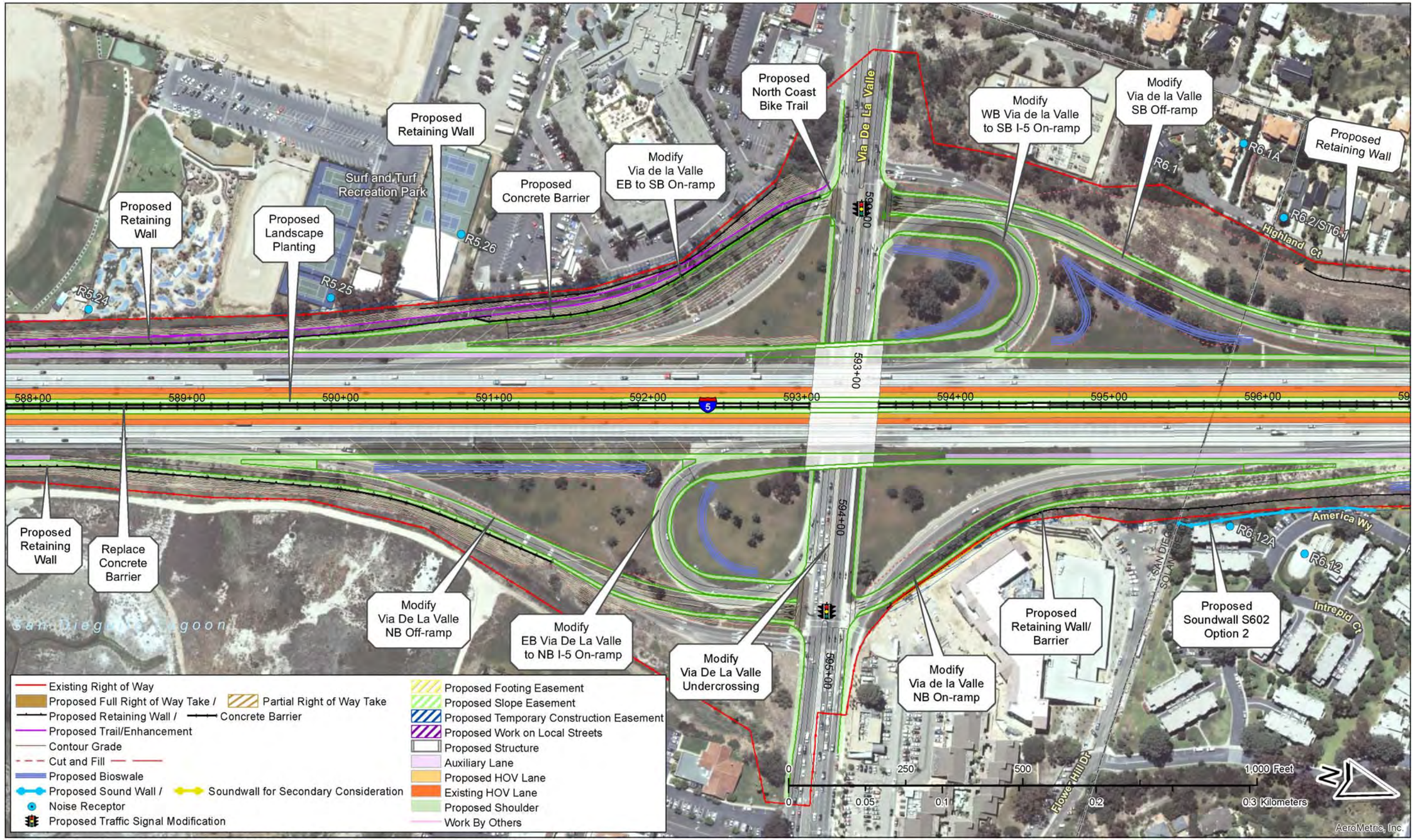


Figure 2-2.3, Sheet 20 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

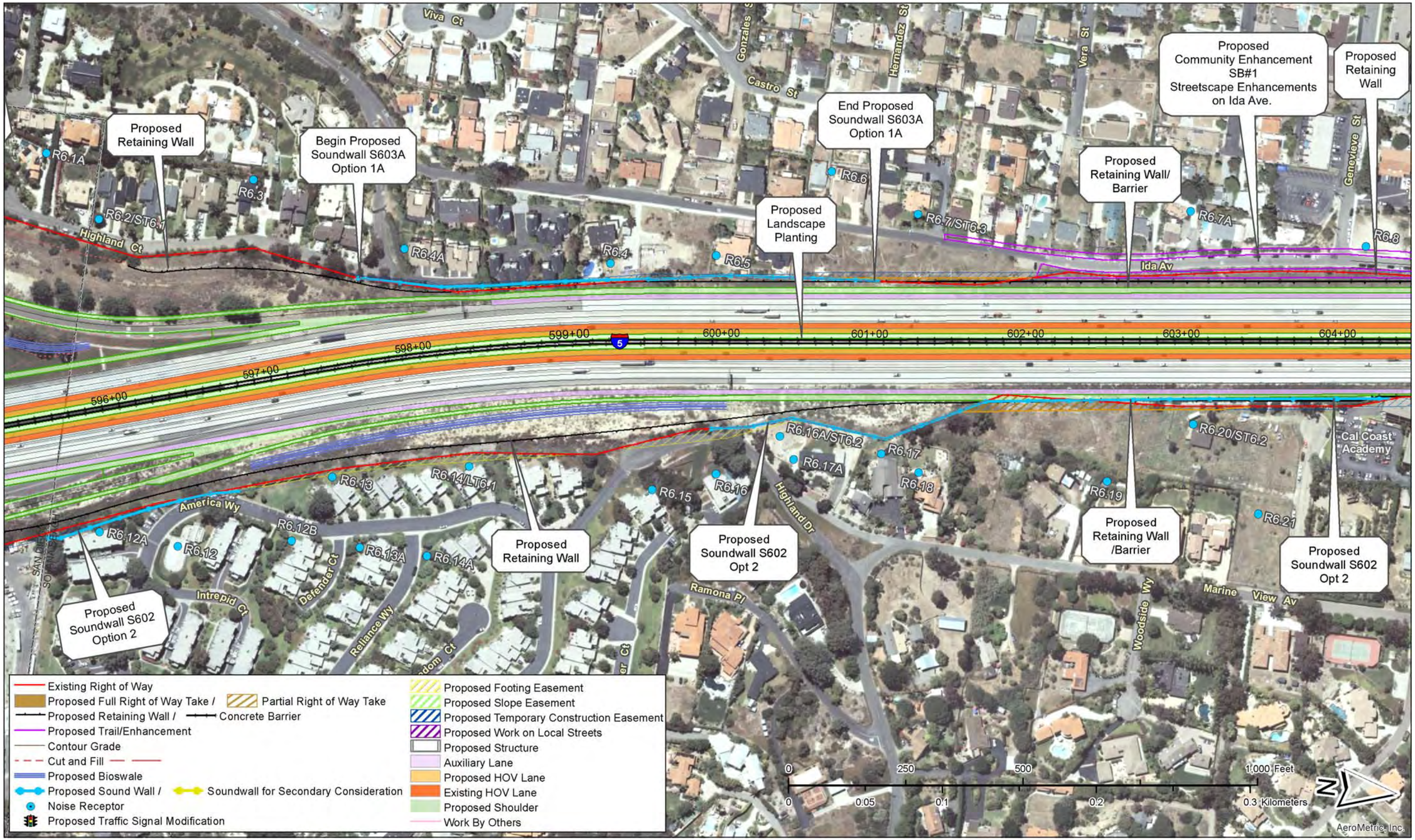


Figure 2-2.3, Sheet 21 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

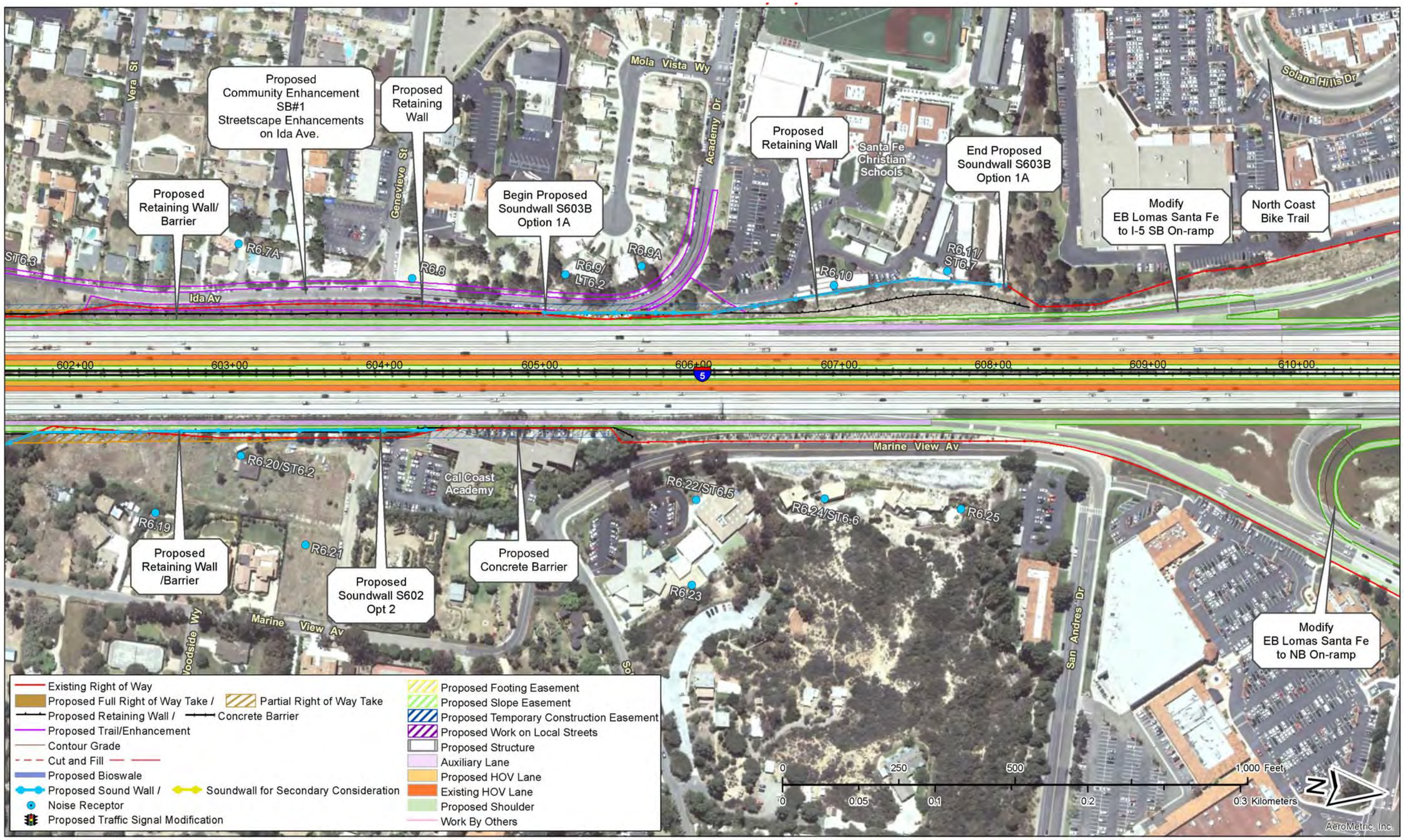


Figure 2-2.3, Sheet 22 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

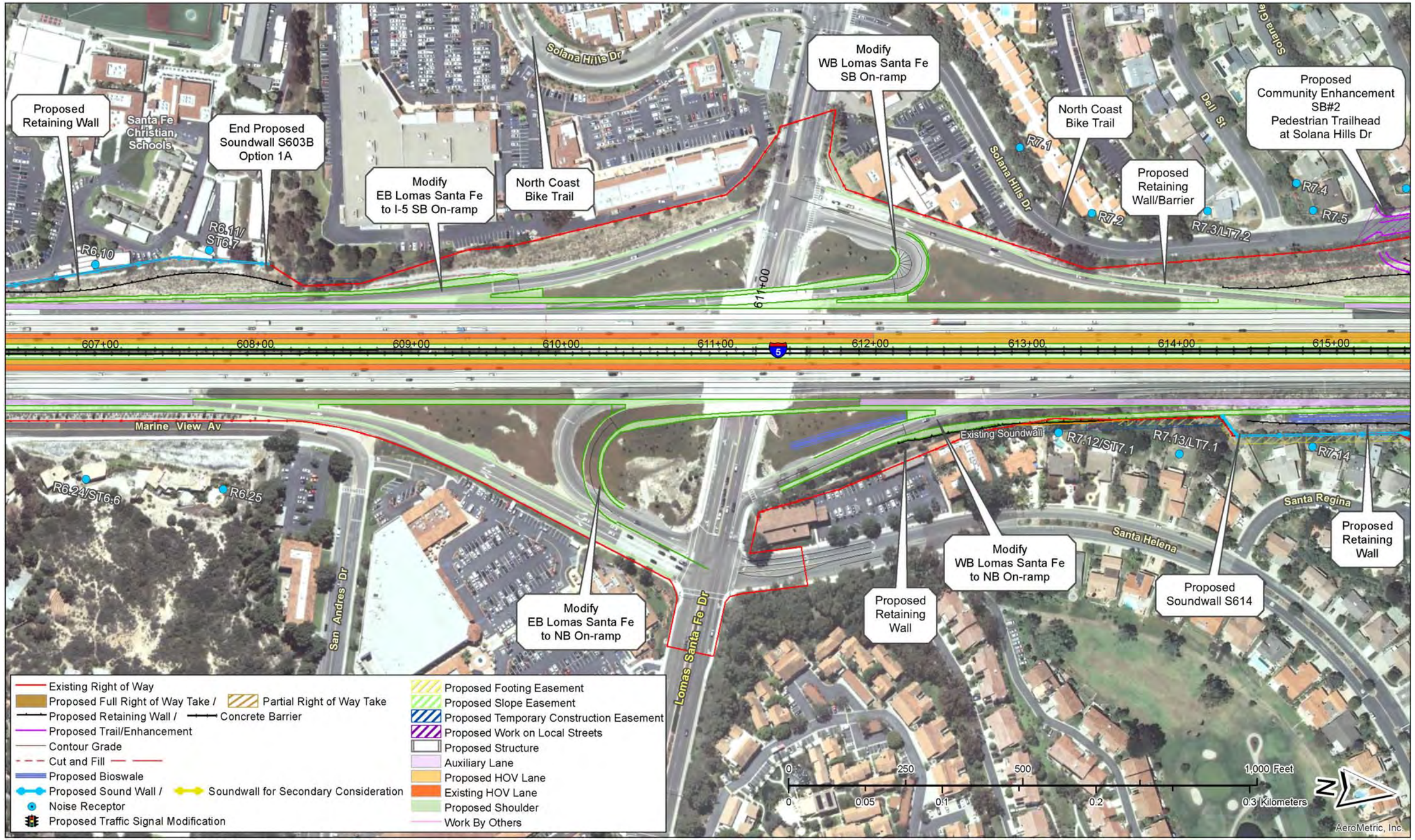


Figure 2-2.3, Sheet 23 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

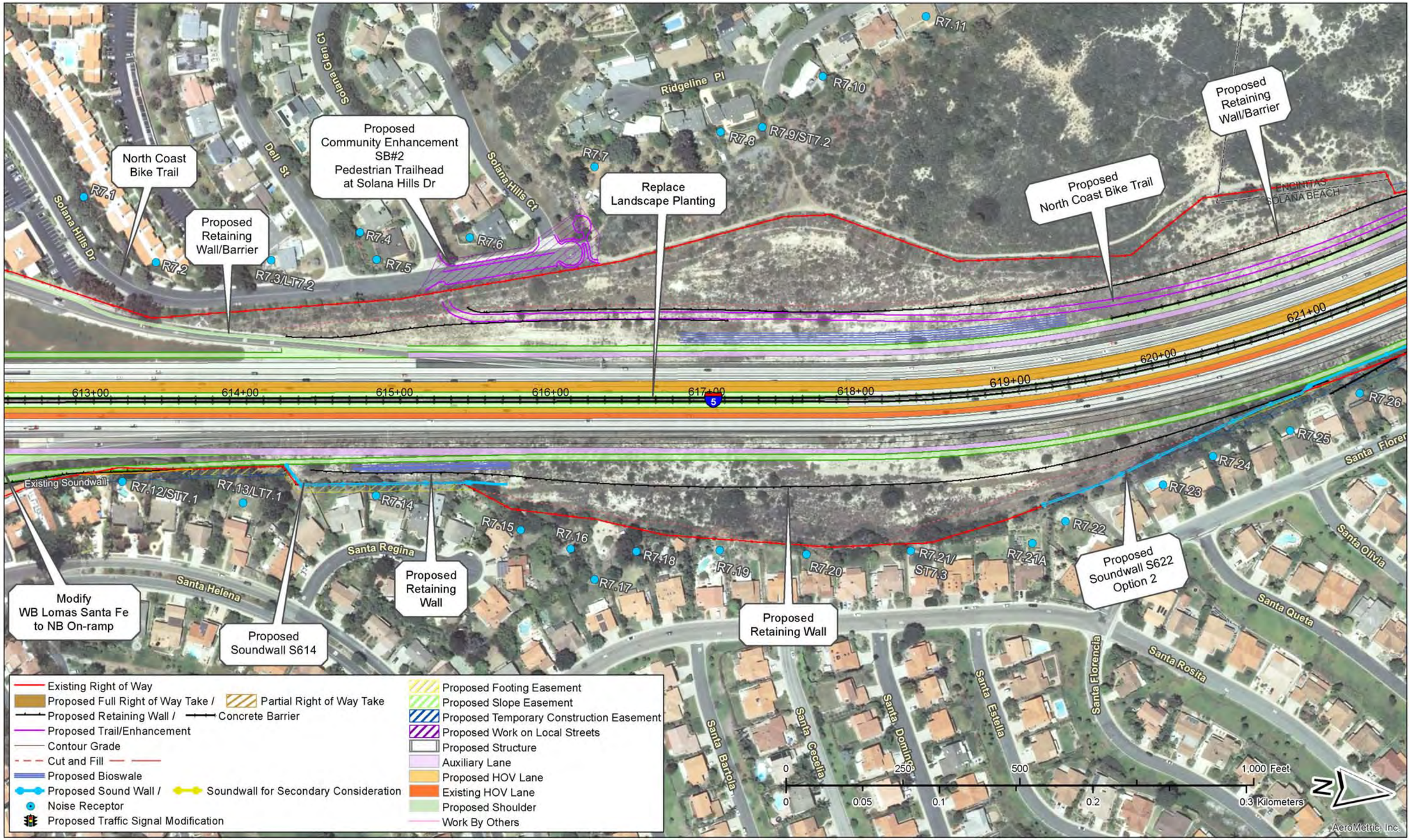


Figure 2-2.3, Sheet 24 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

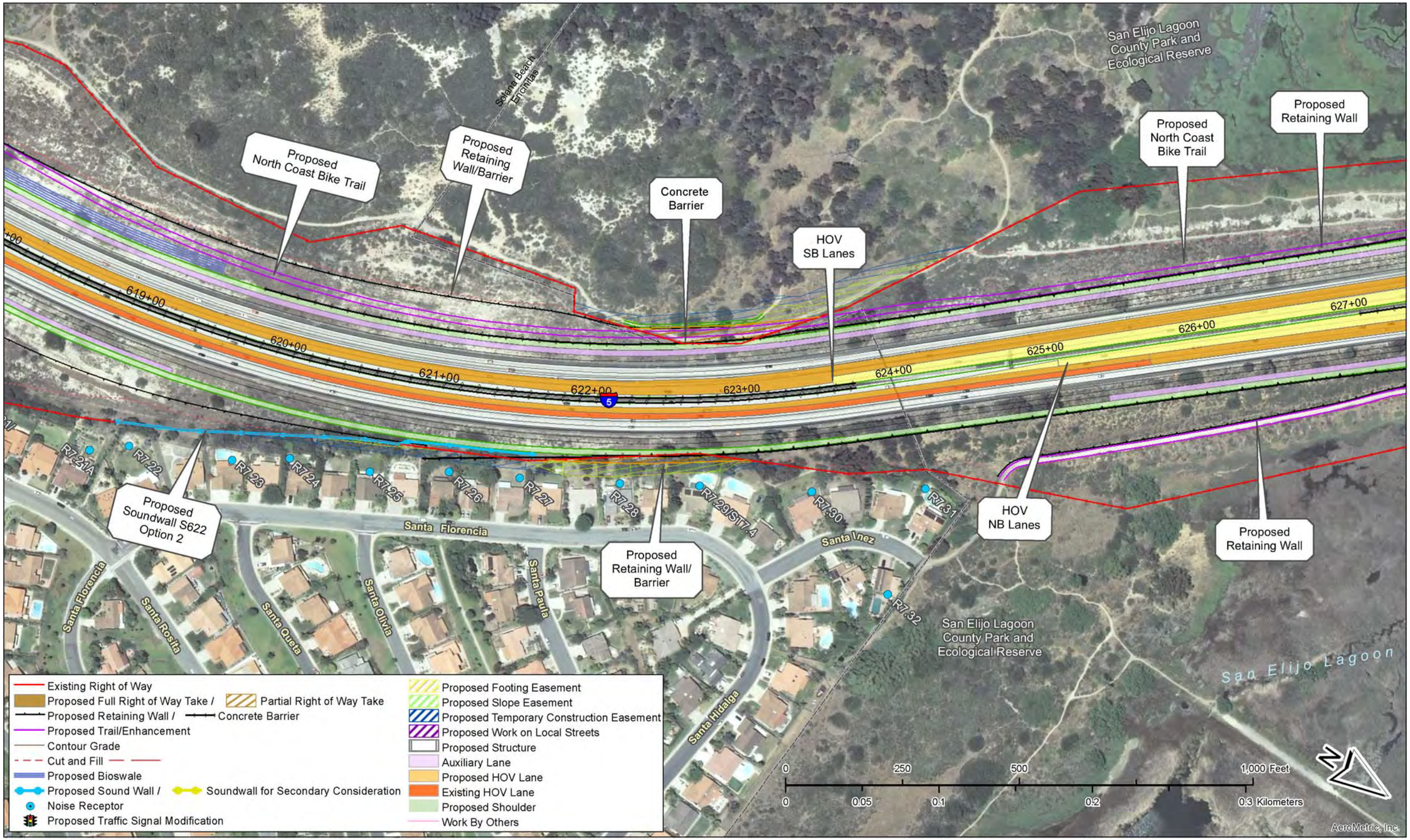


Figure 2-2.3, Sheet 25 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

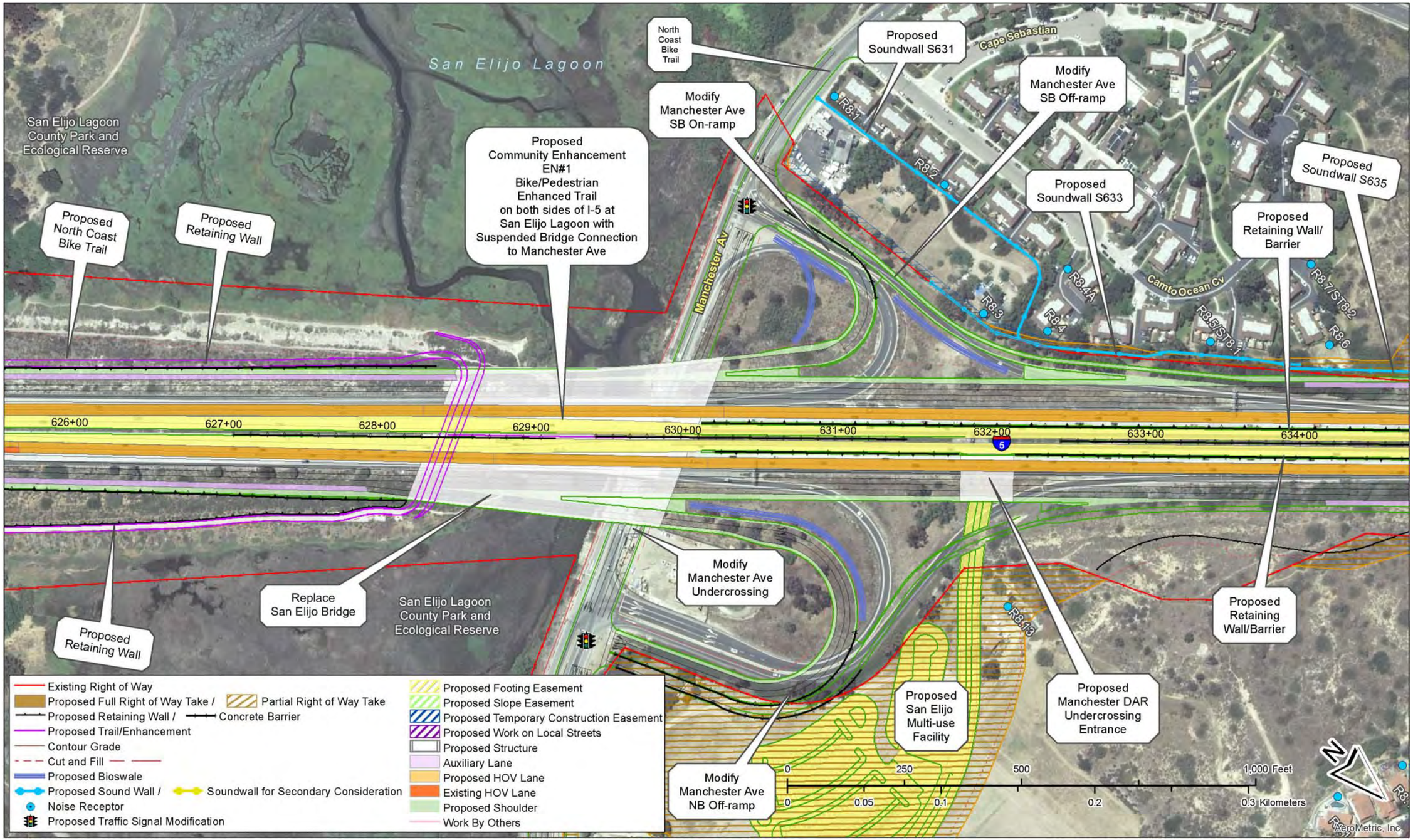


Figure 2-2.3, Sheet 26 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

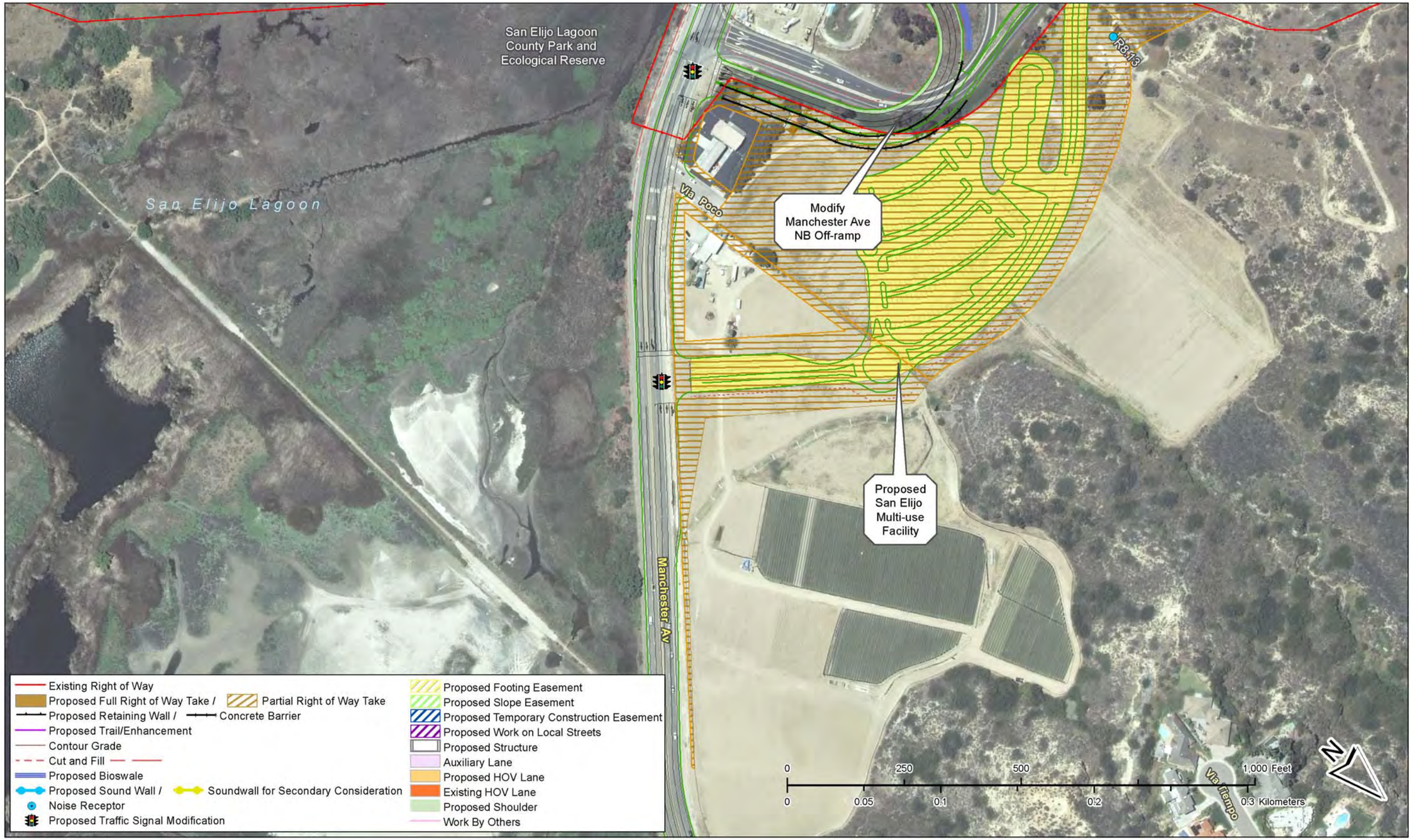


Figure 2-2.3, Sheet 27 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

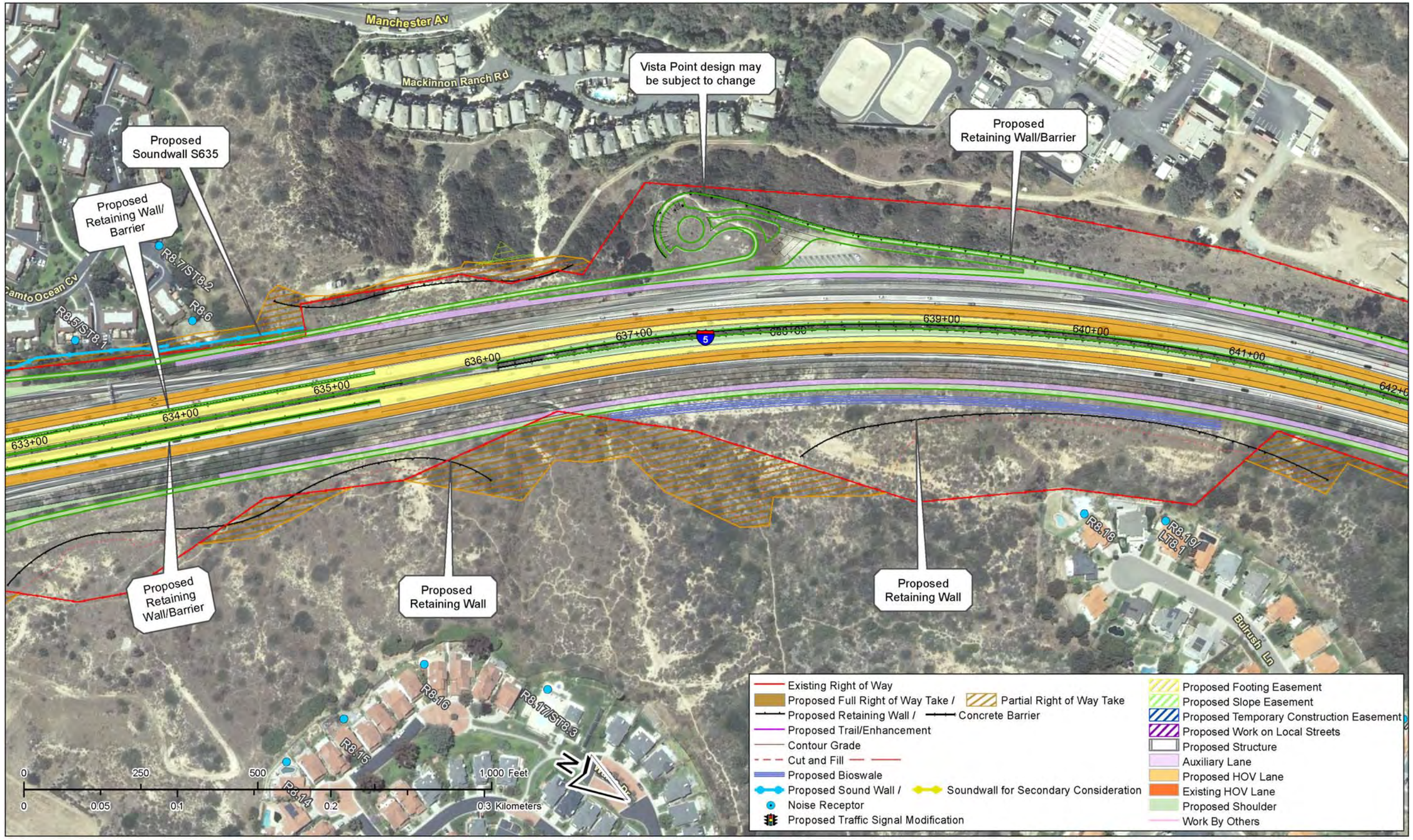


Figure 2-2.3, Sheet 28 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

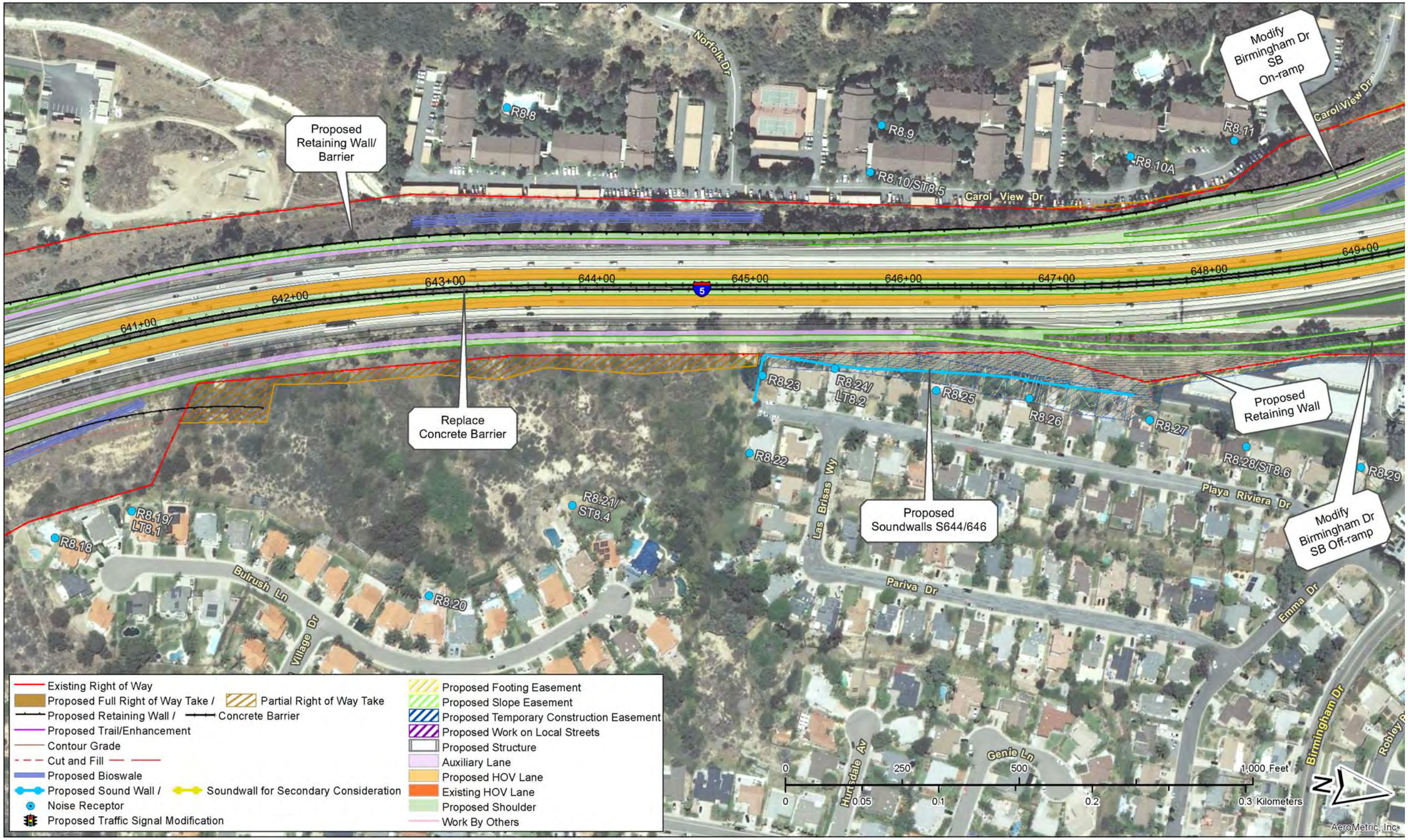


Figure 2-2.3, Sheet 29 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

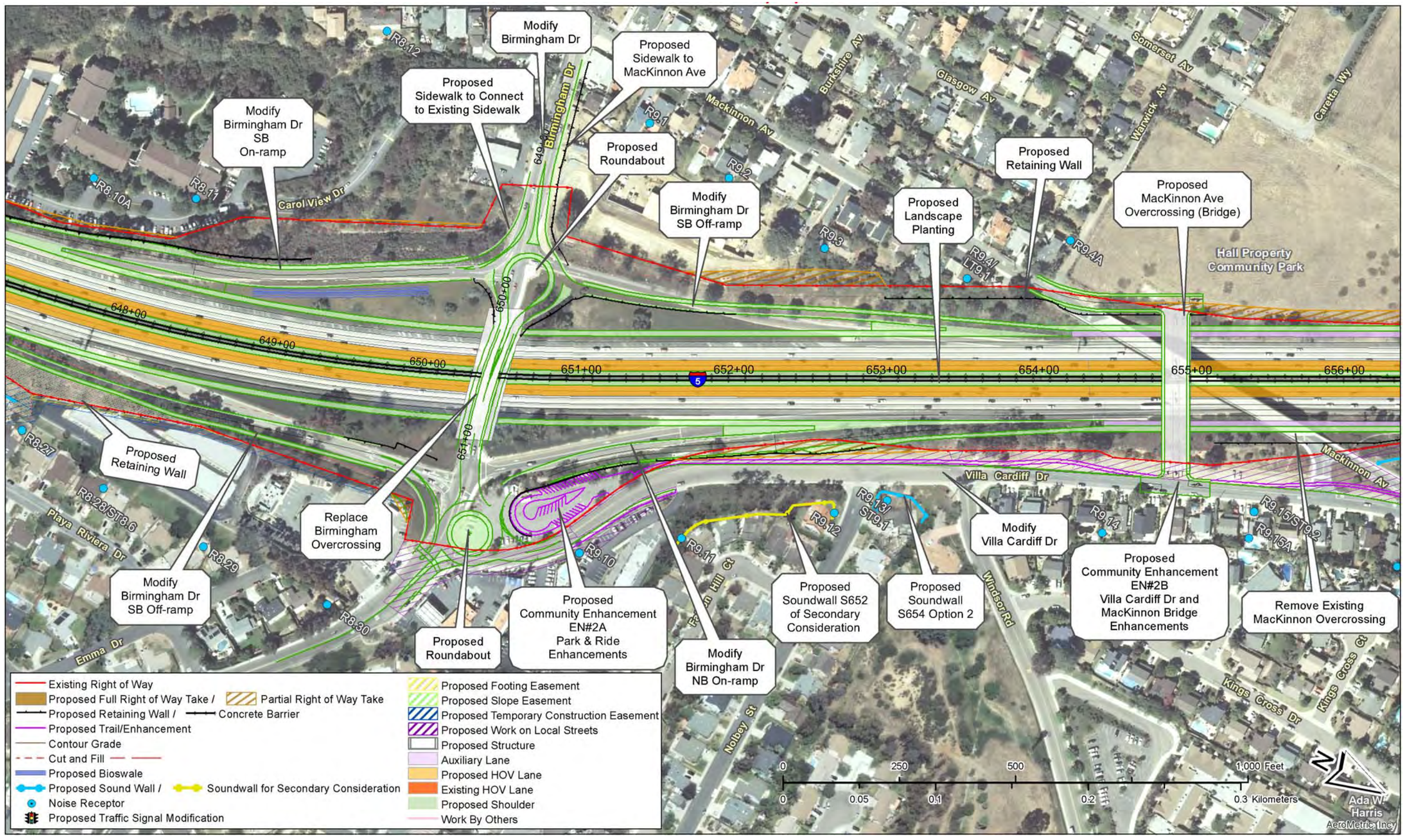


Figure 2-2.3, Sheet 30 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

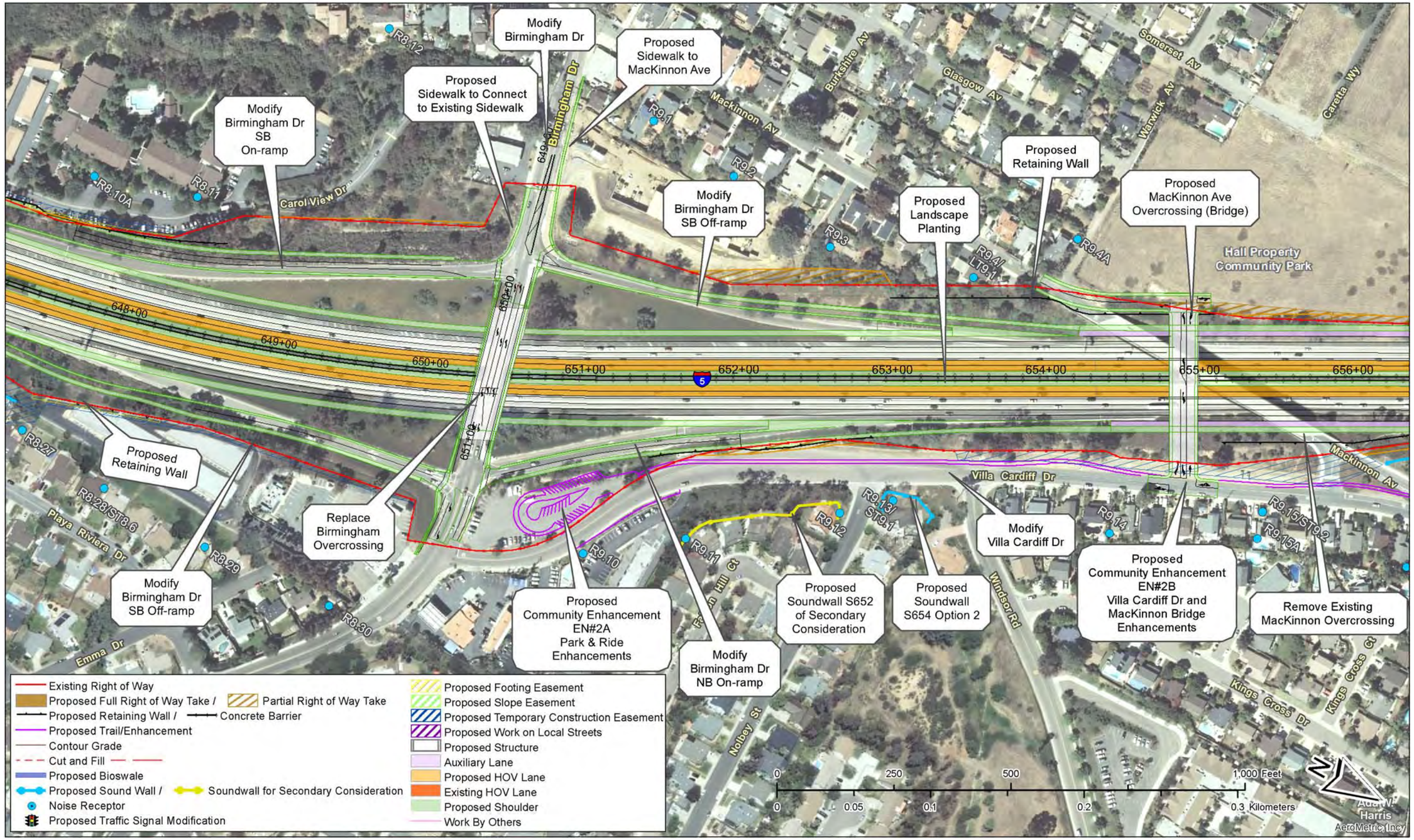


Figure 2-2.3, Sheet 30a of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

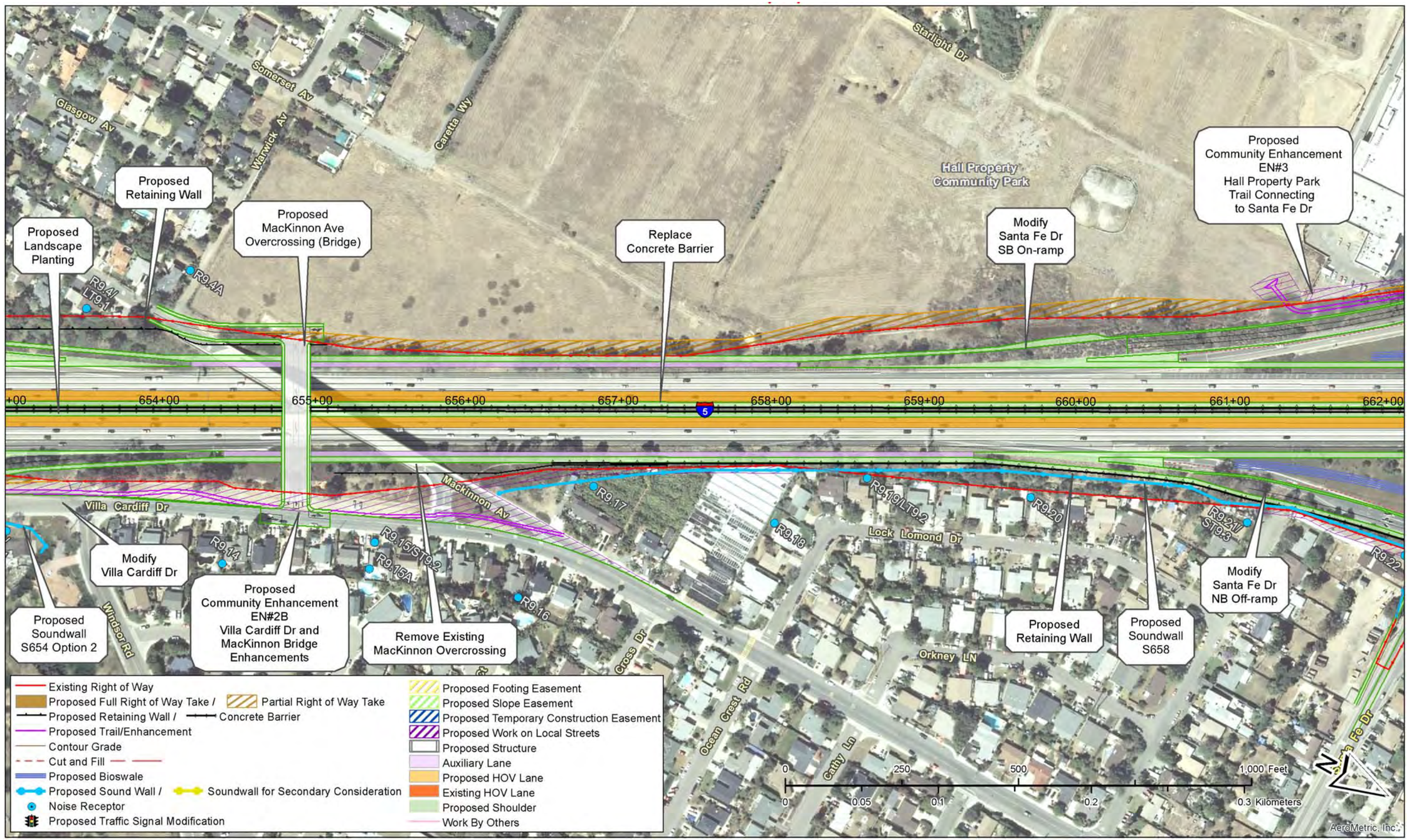


Figure 2-2.3, Sheet 31 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

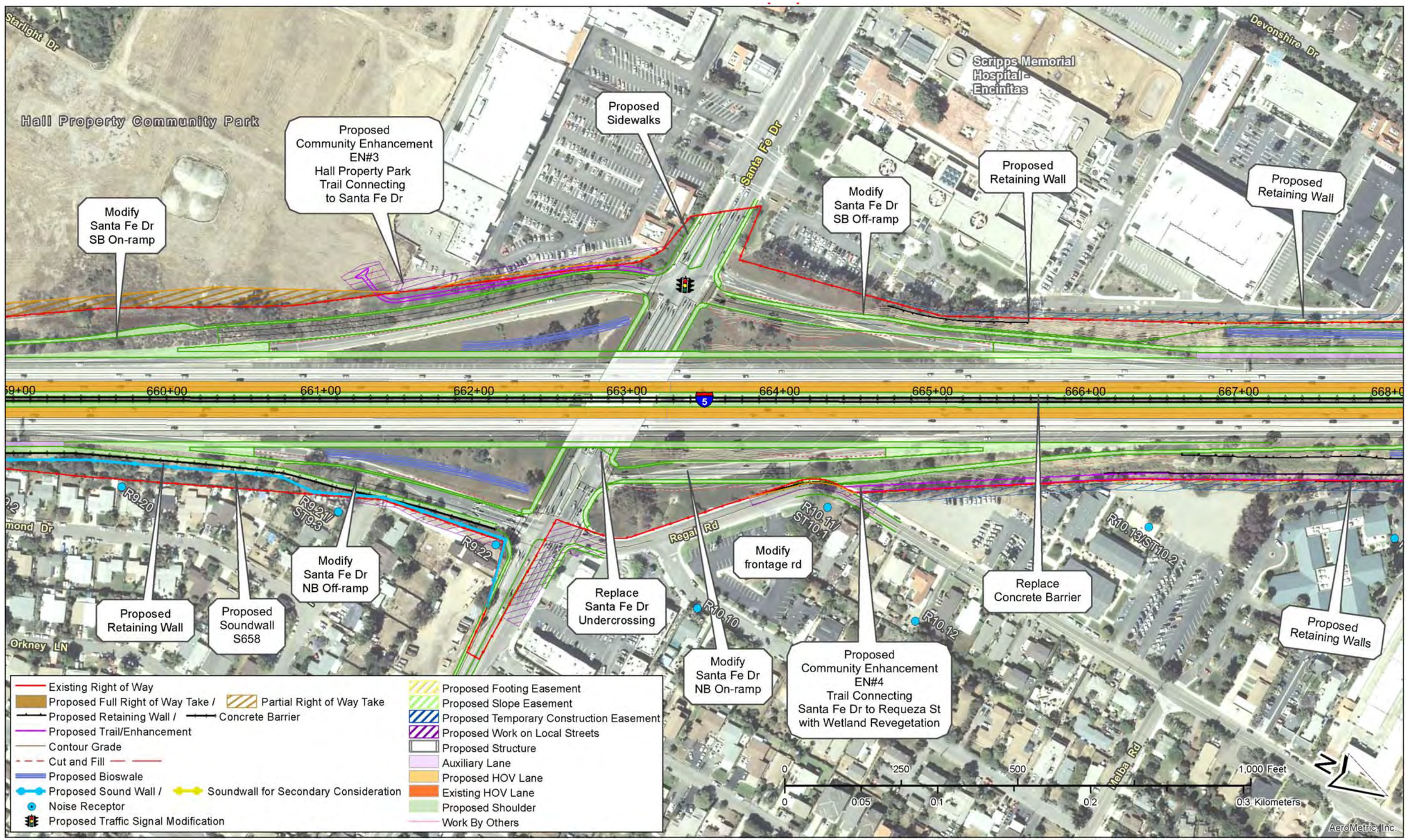


Figure 2-2.3, Sheet 32 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

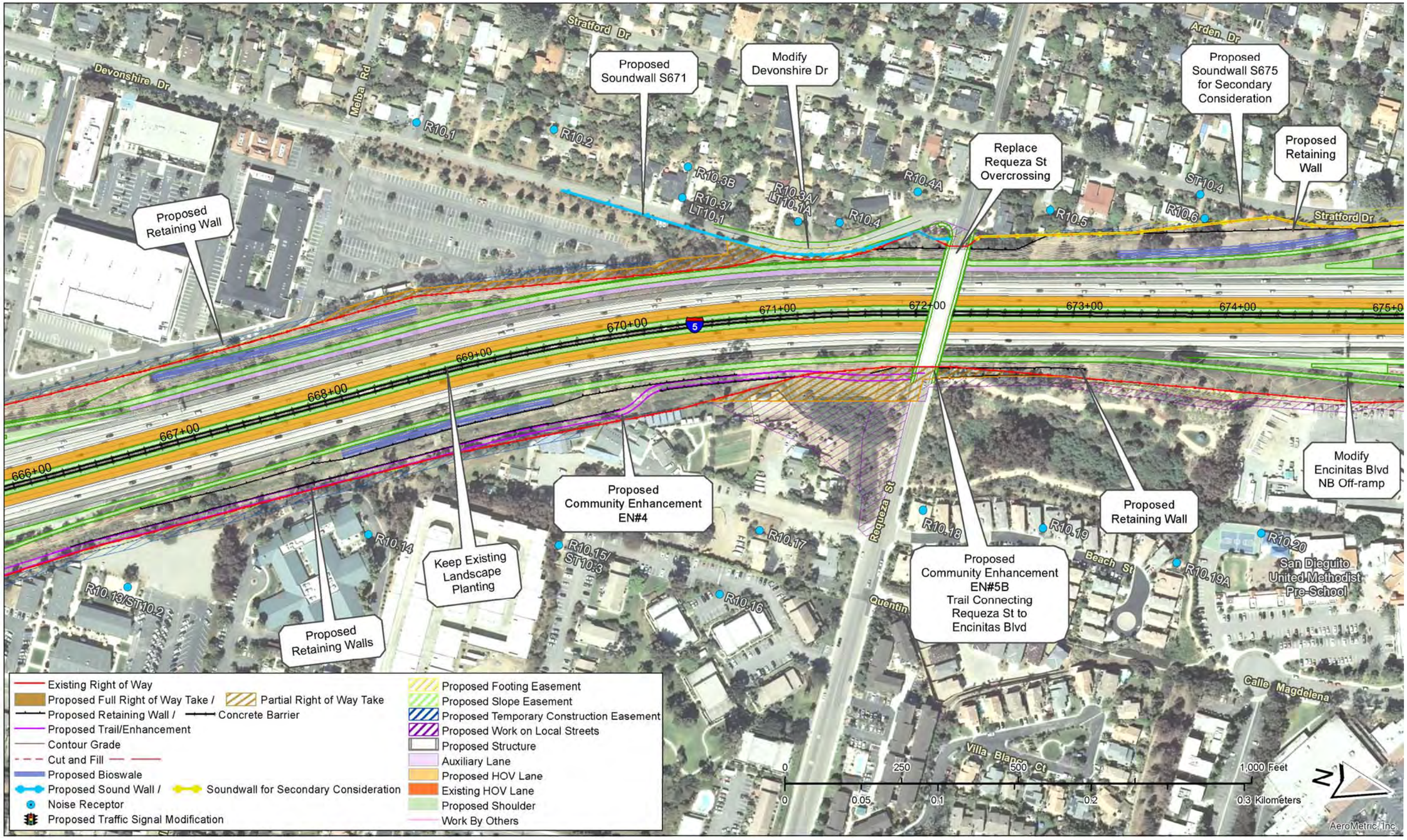


Figure 2-2.3, Sheet 33 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

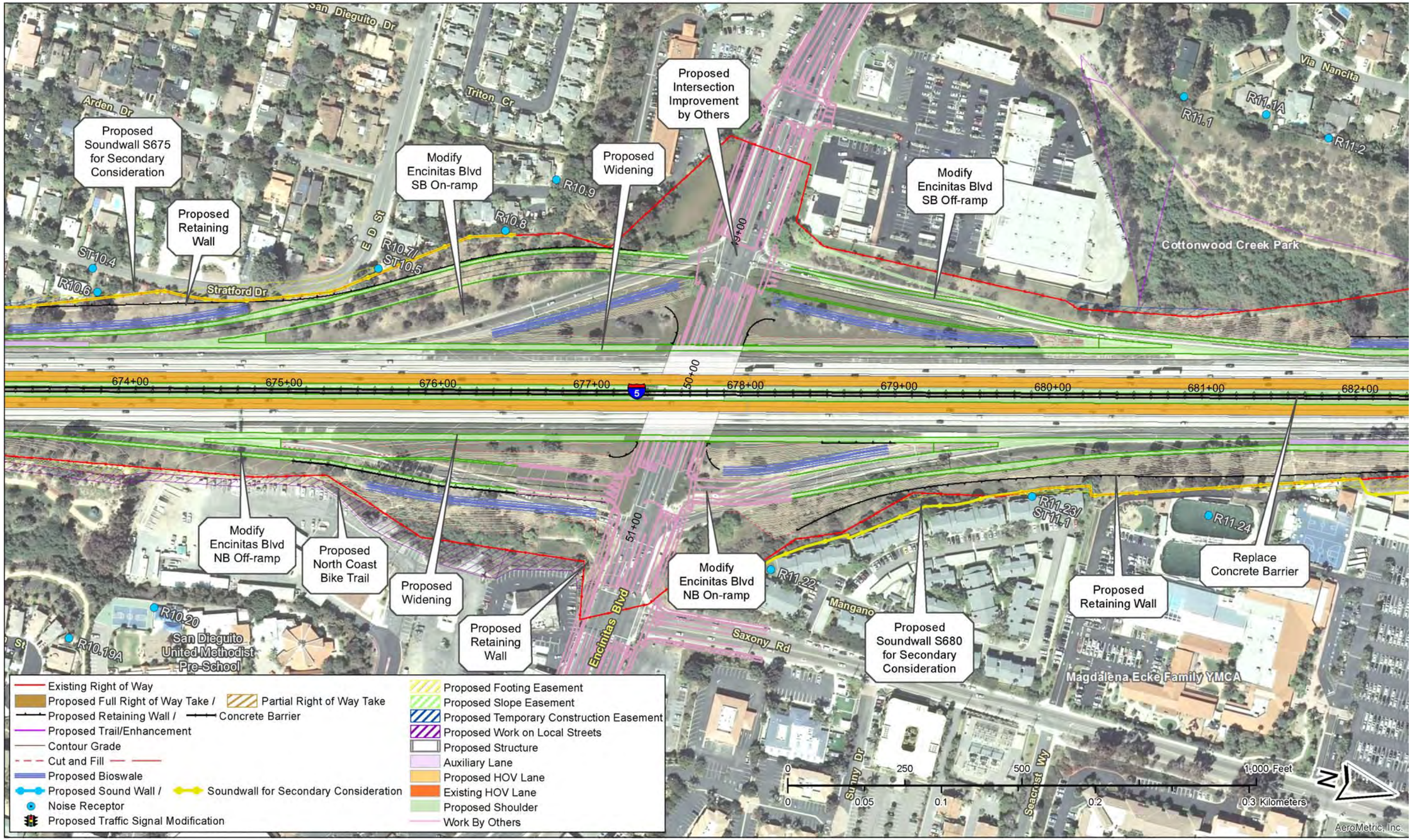


Figure 2-2.3, Sheet 34 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

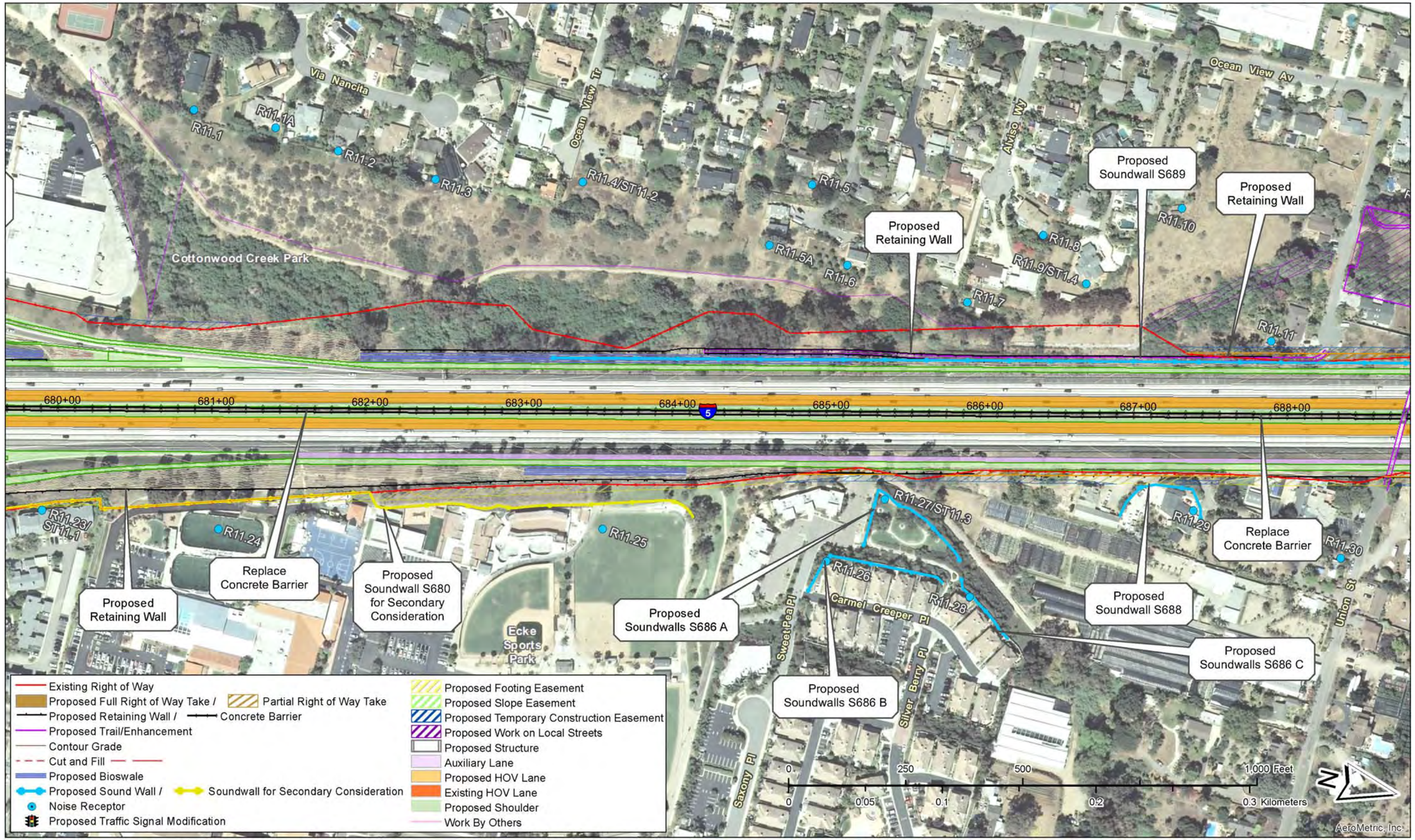


Figure 2-2.3, Sheet 35 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

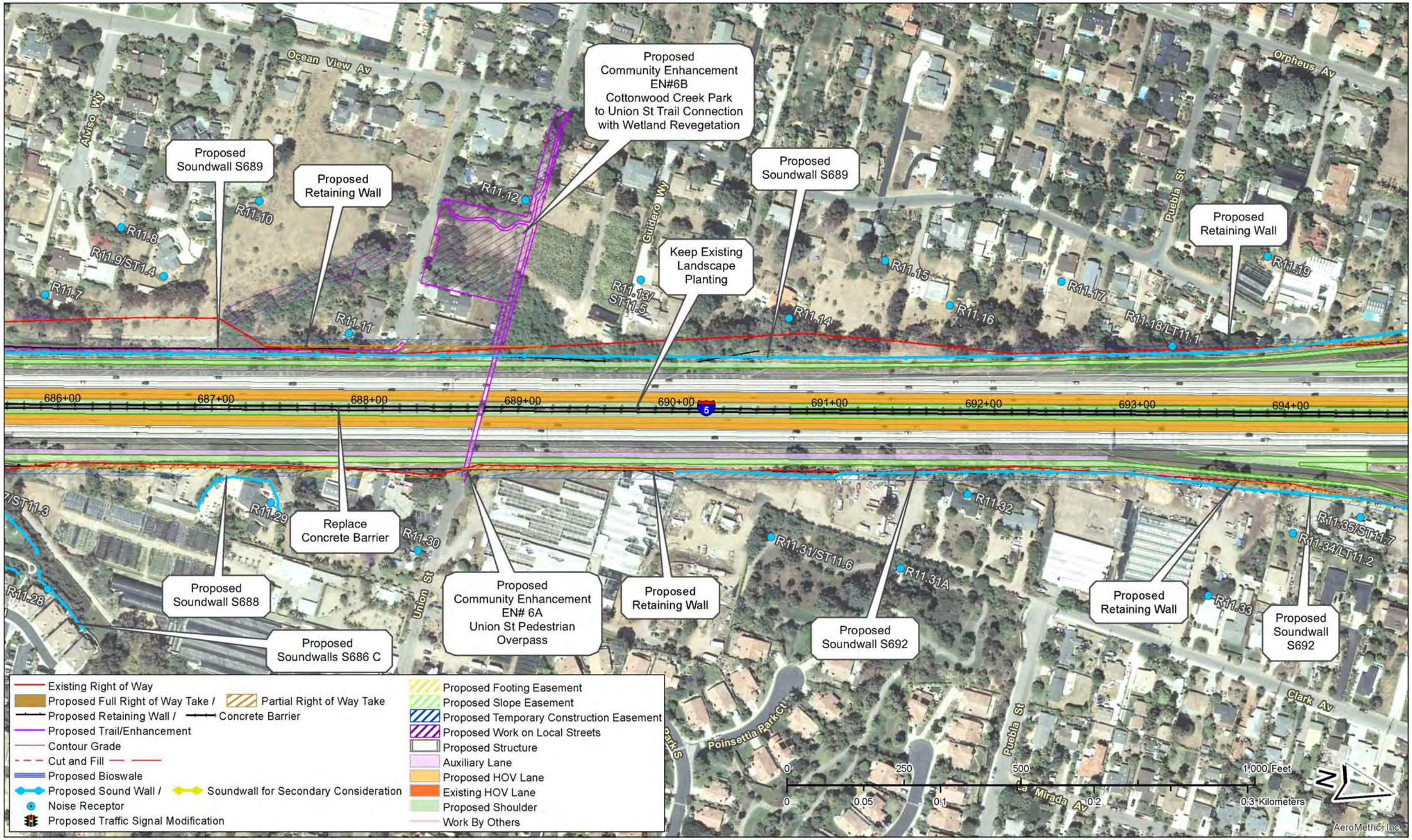


Figure 2-2.3, Sheet 36 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

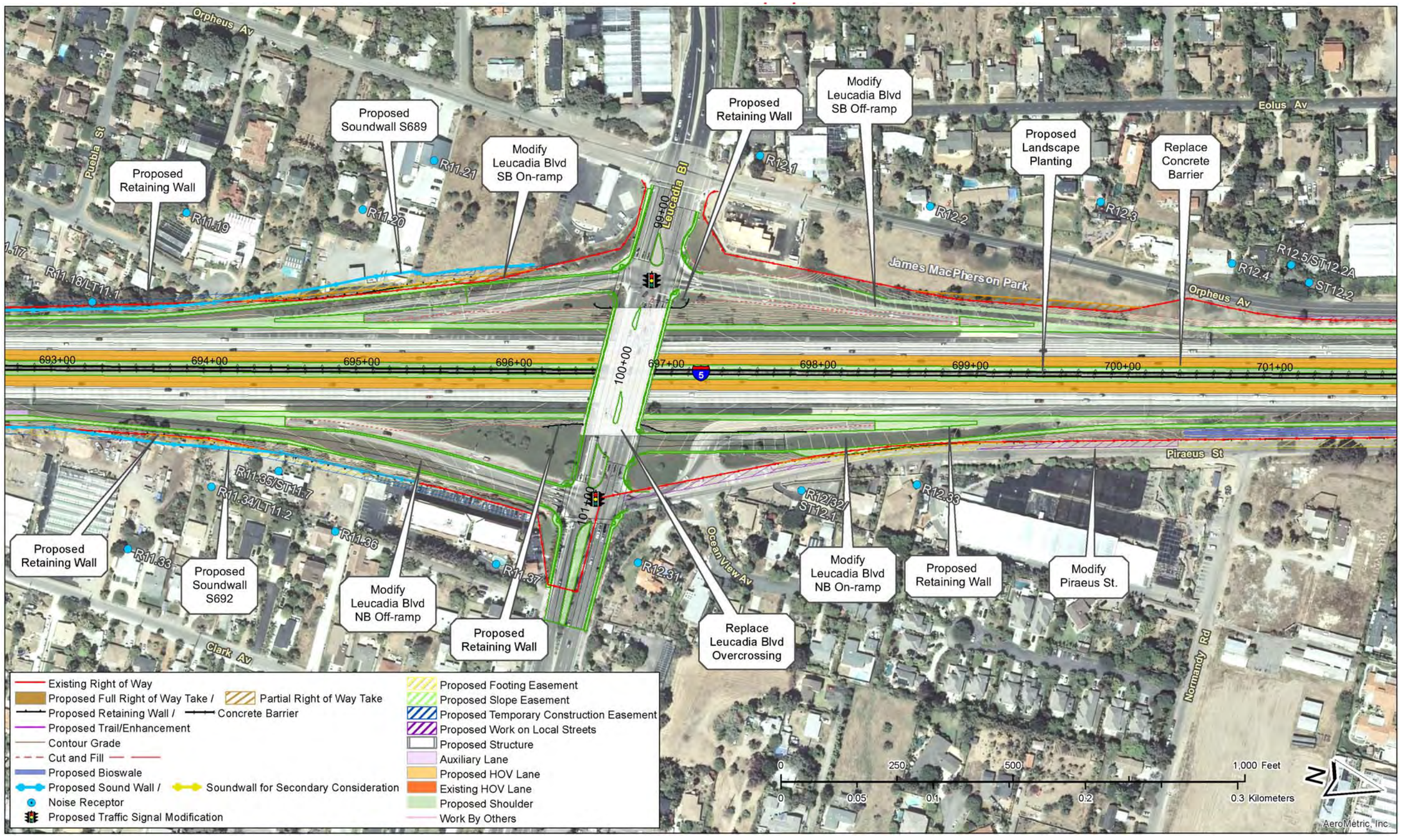


Figure 2-2.3, Sheet 37 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

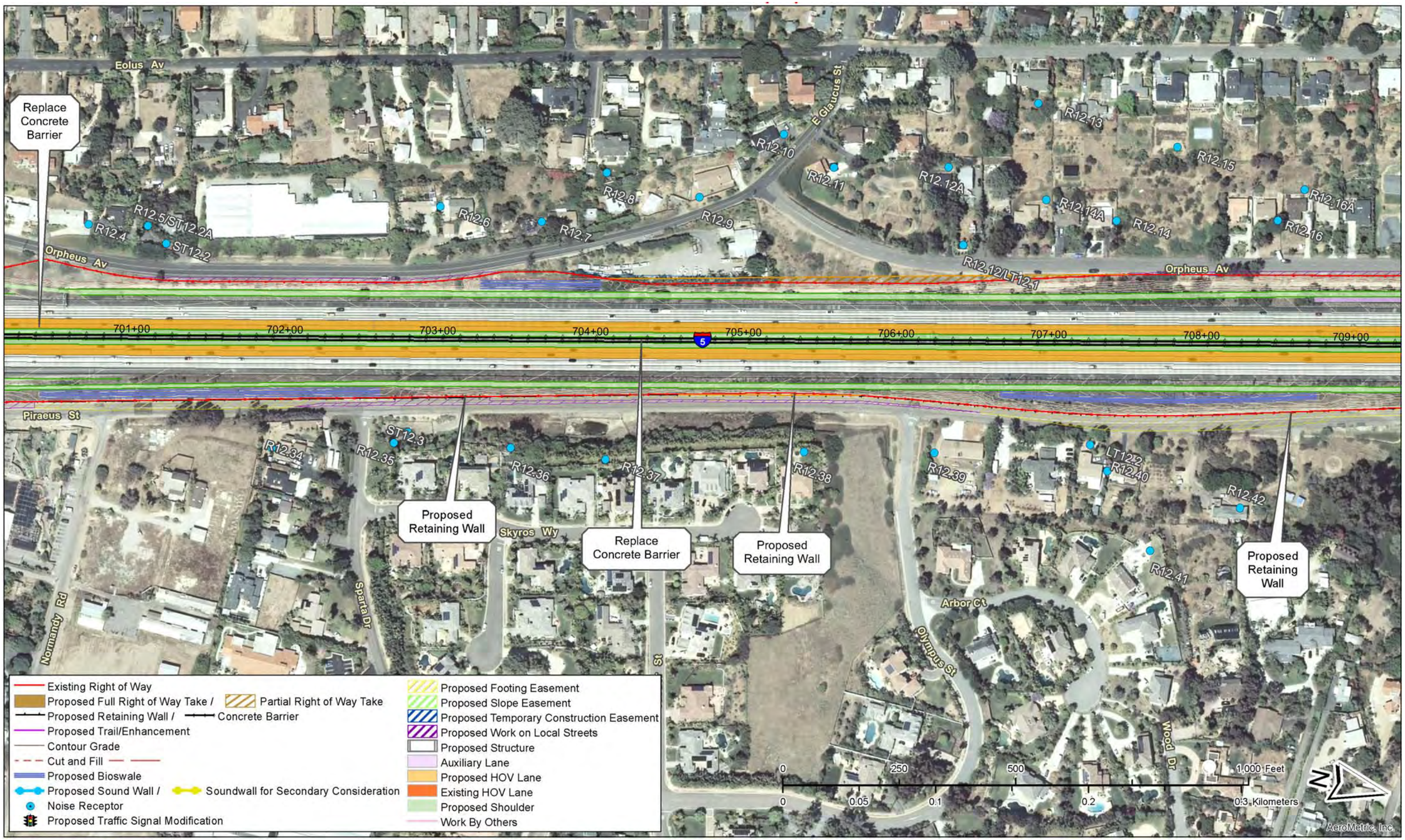


Figure 2-2.3, Sheet 38 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

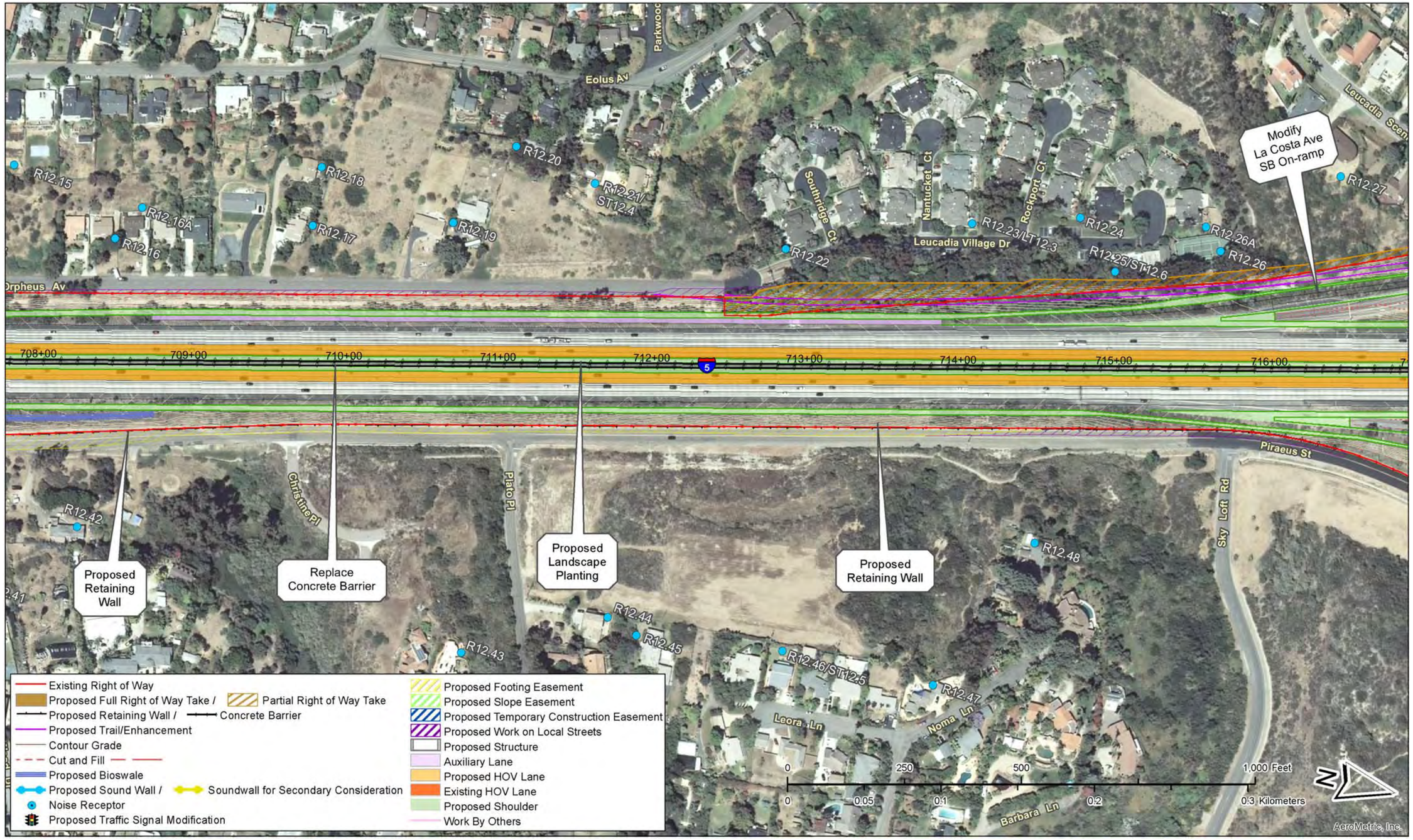


Figure 2-2.3, Sheet 39 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

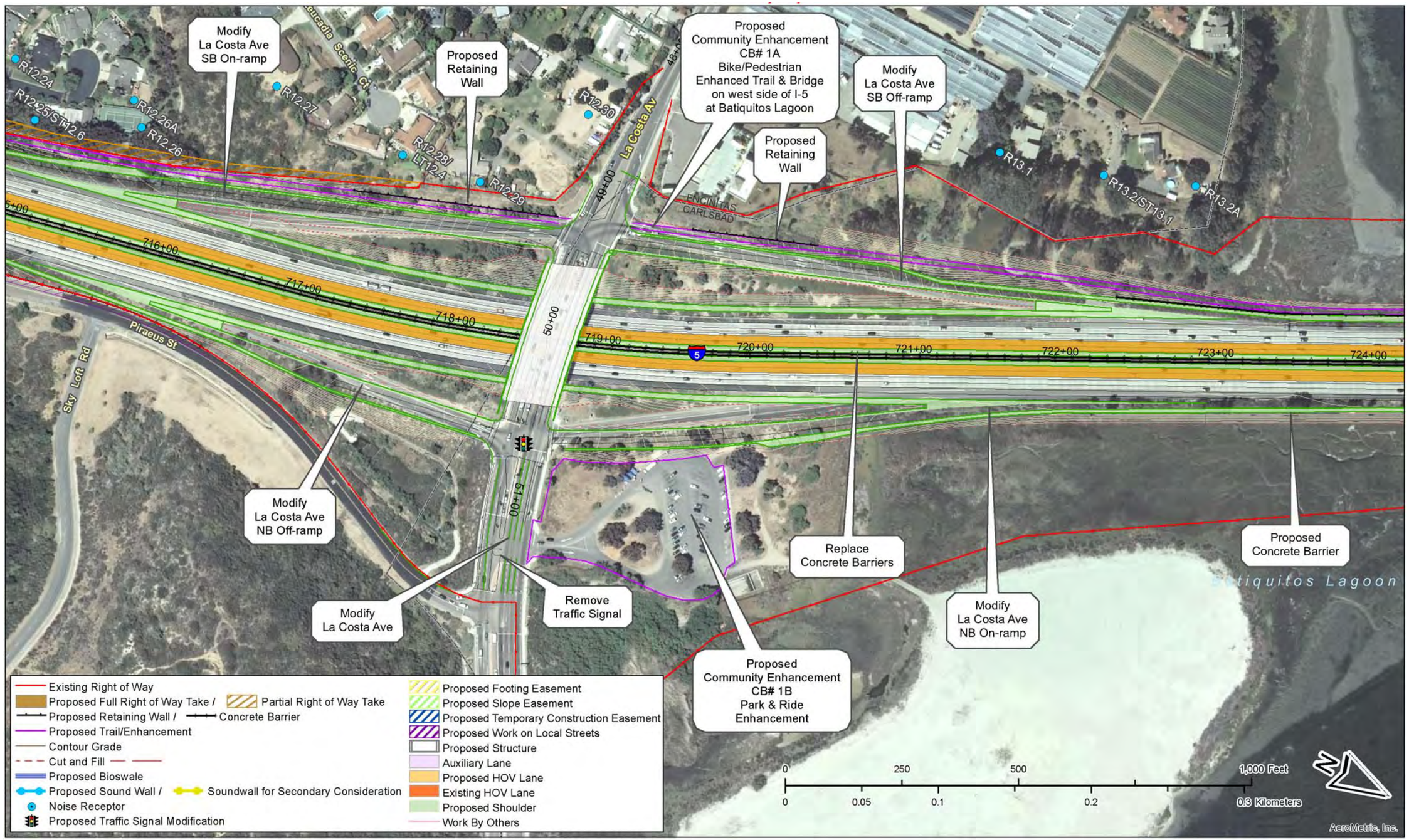


Figure 2-2.3, Sheet 40 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

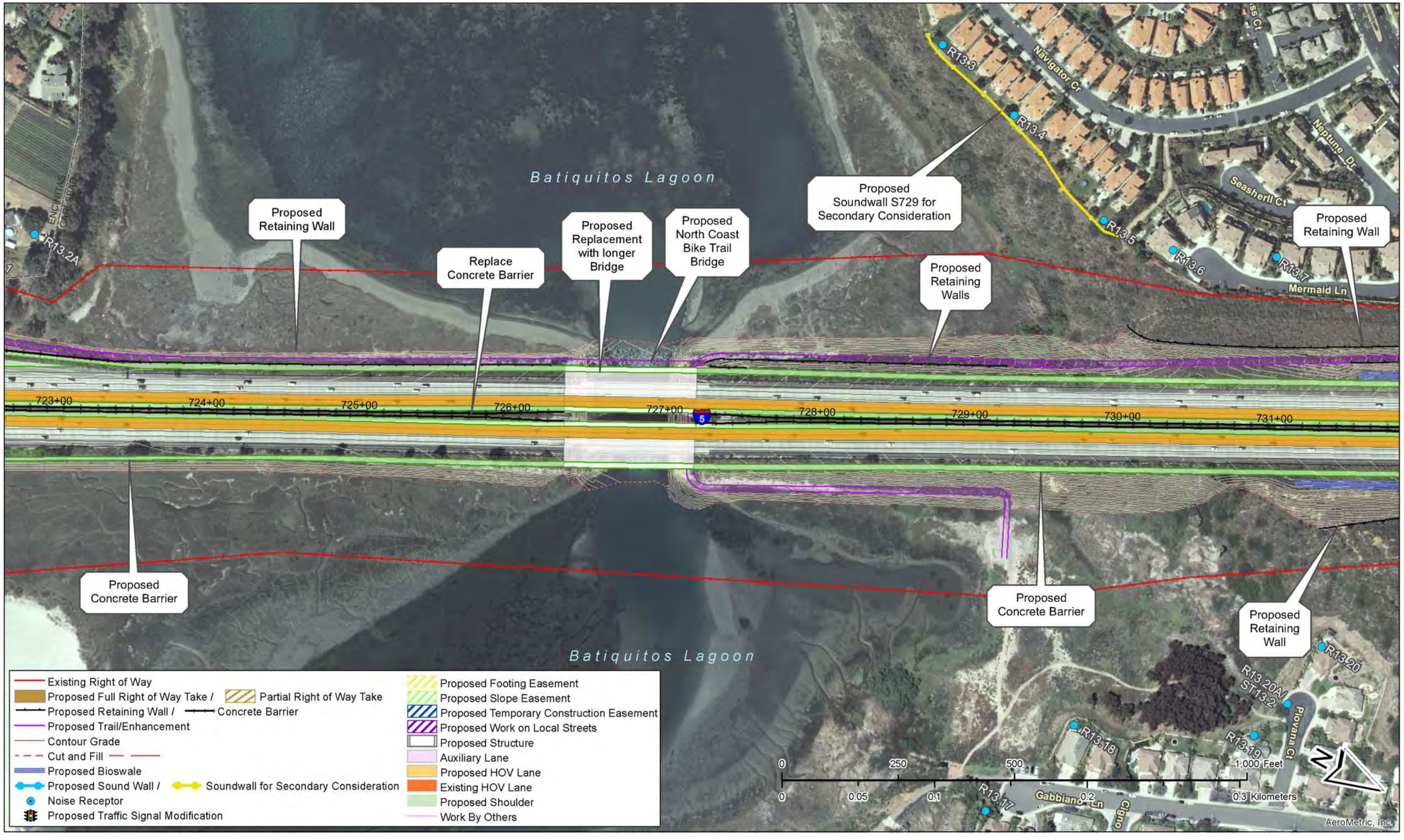


Figure 2-2.3, Sheet 41 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

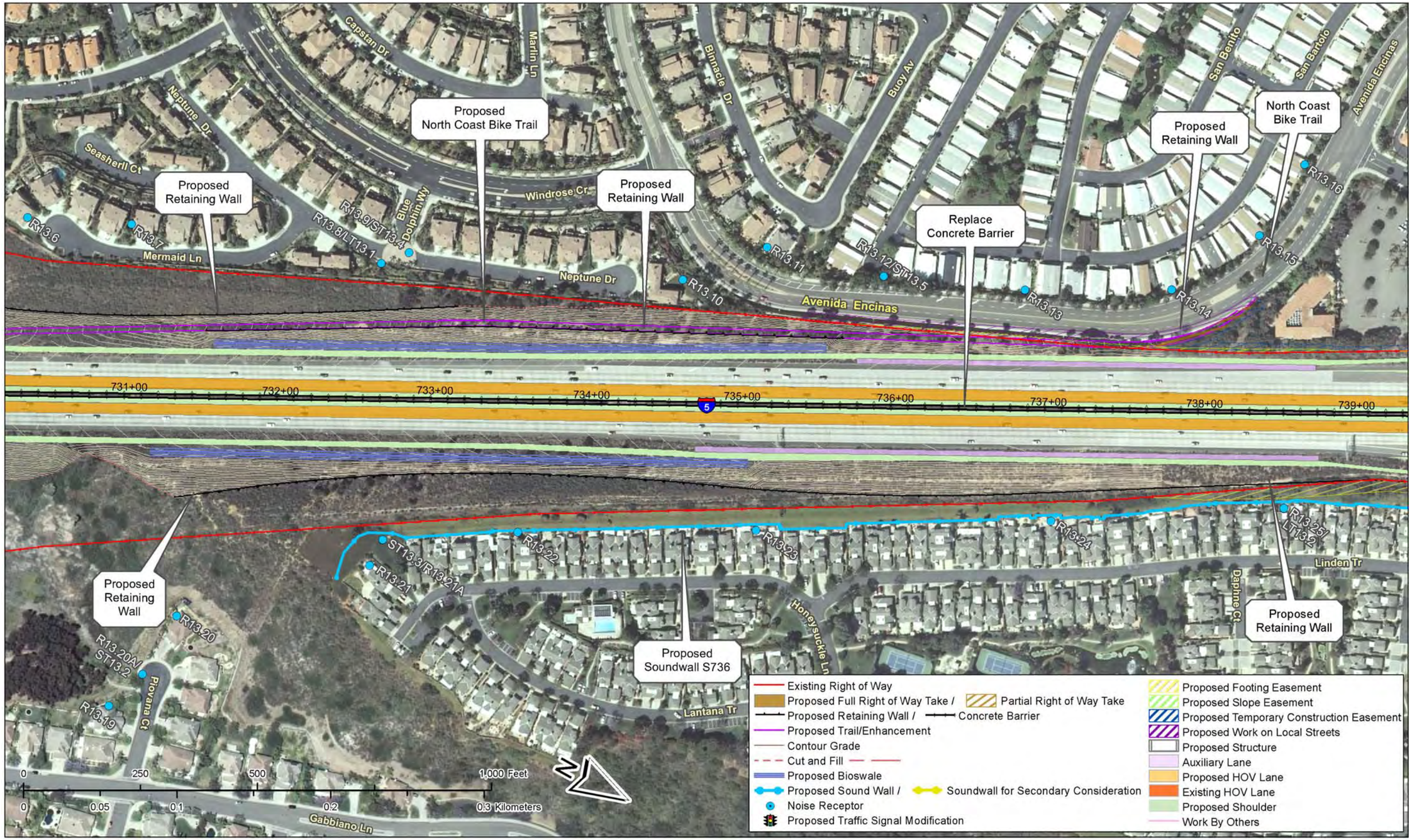


Figure 2-2.3, Sheet 42 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

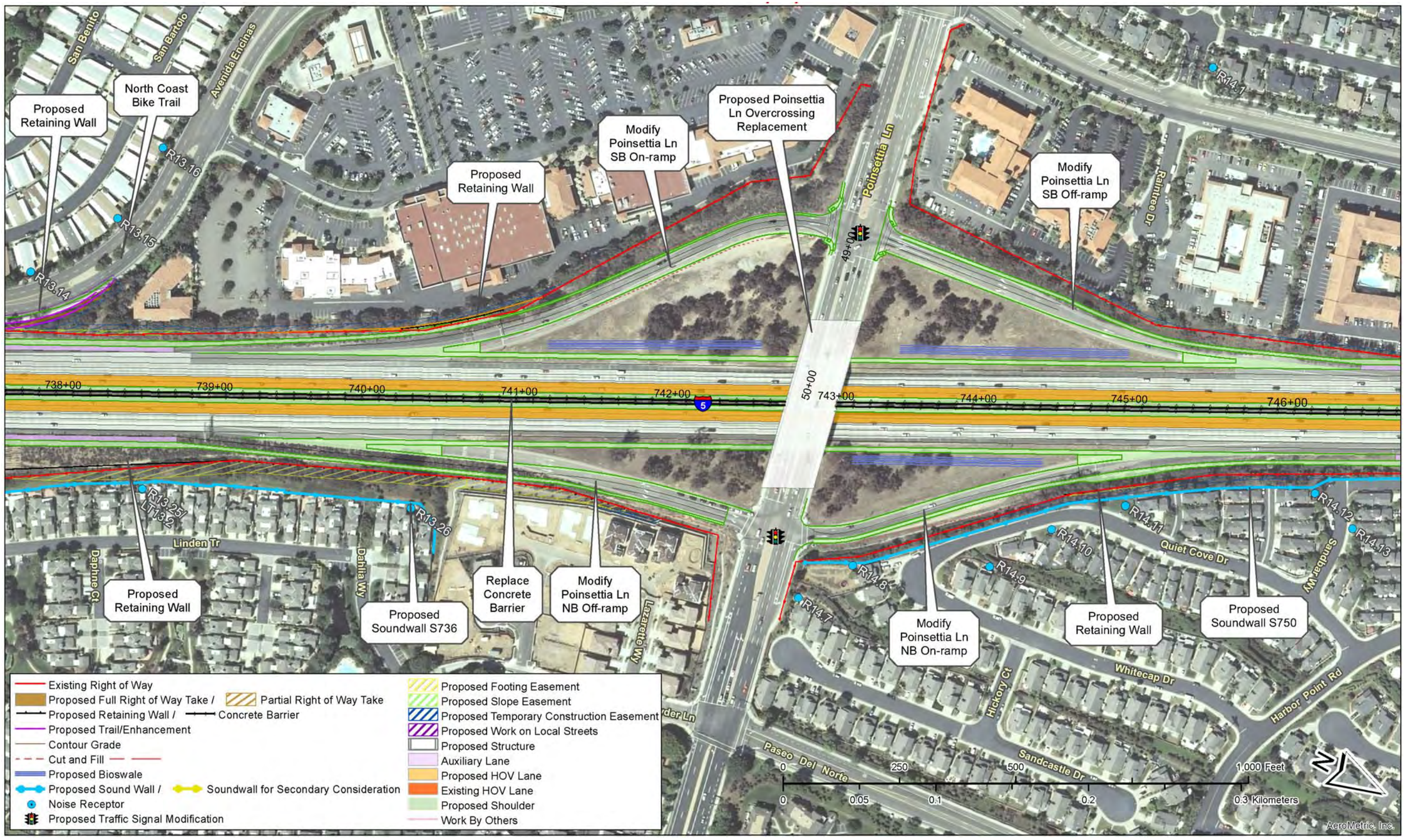


Figure 2-2.3, Sheet 43 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

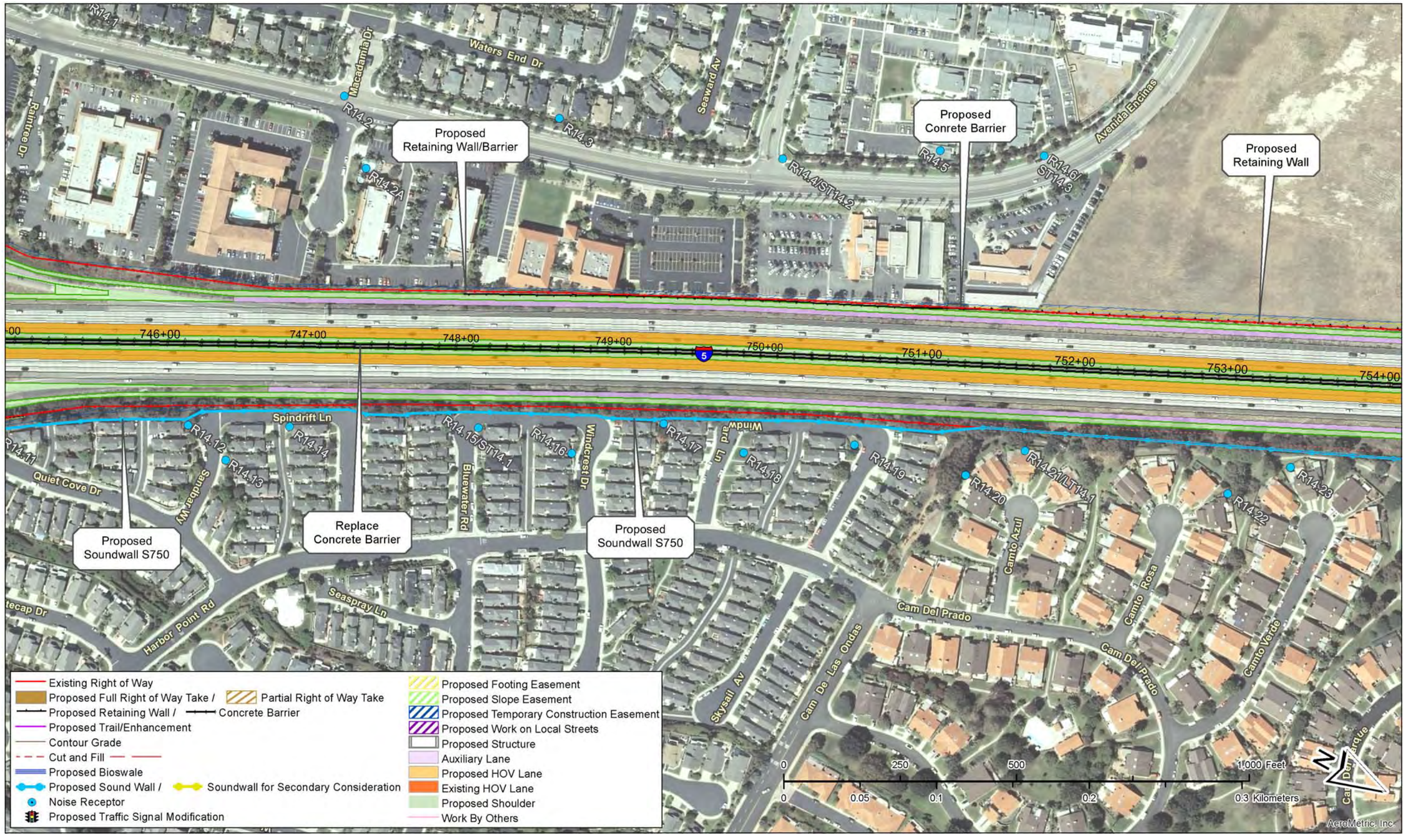


Figure 2-2.3, Sheet 44 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

Figure 2-2.3, Sheet 45 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

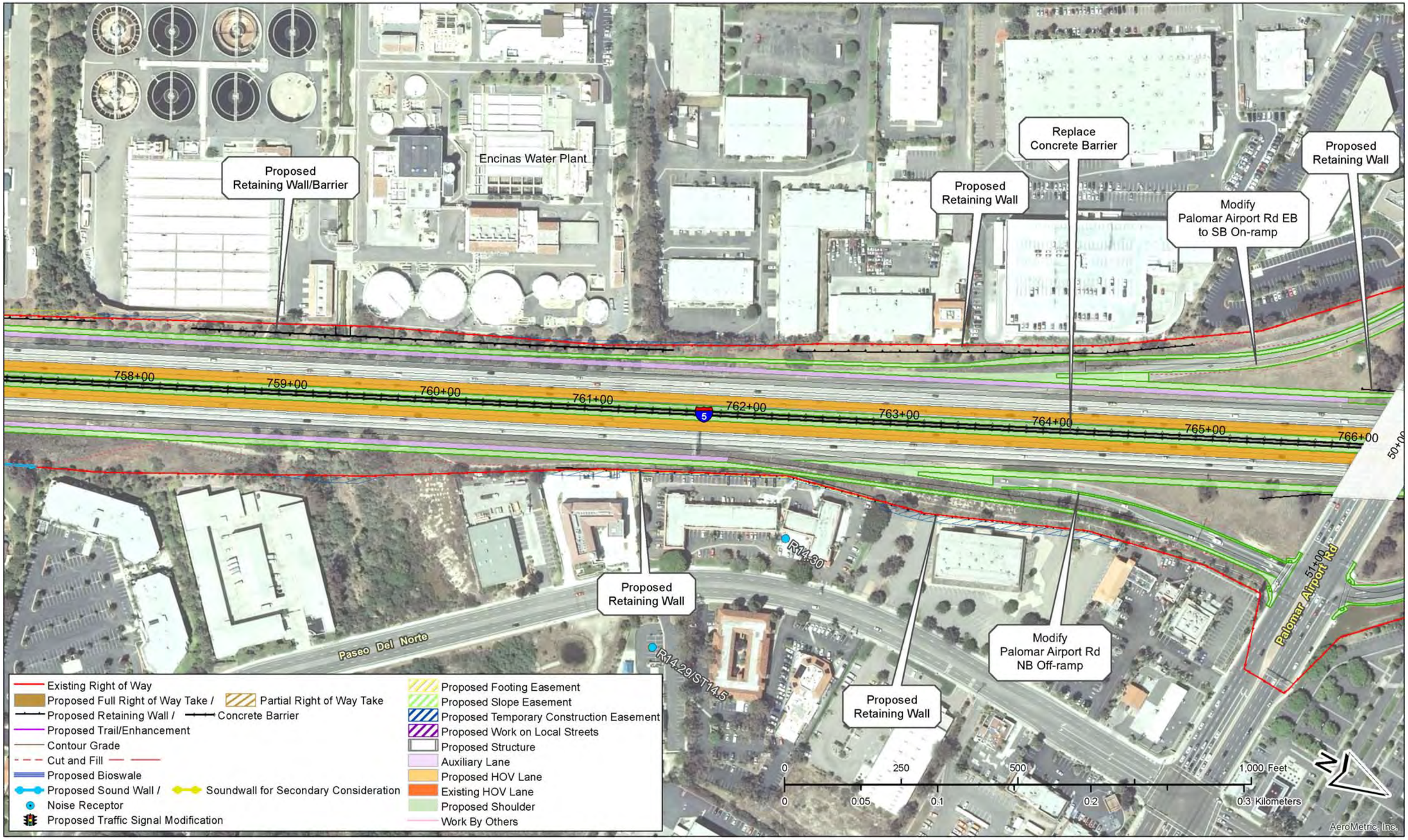


Figure 2-2.3, Sheet 46 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

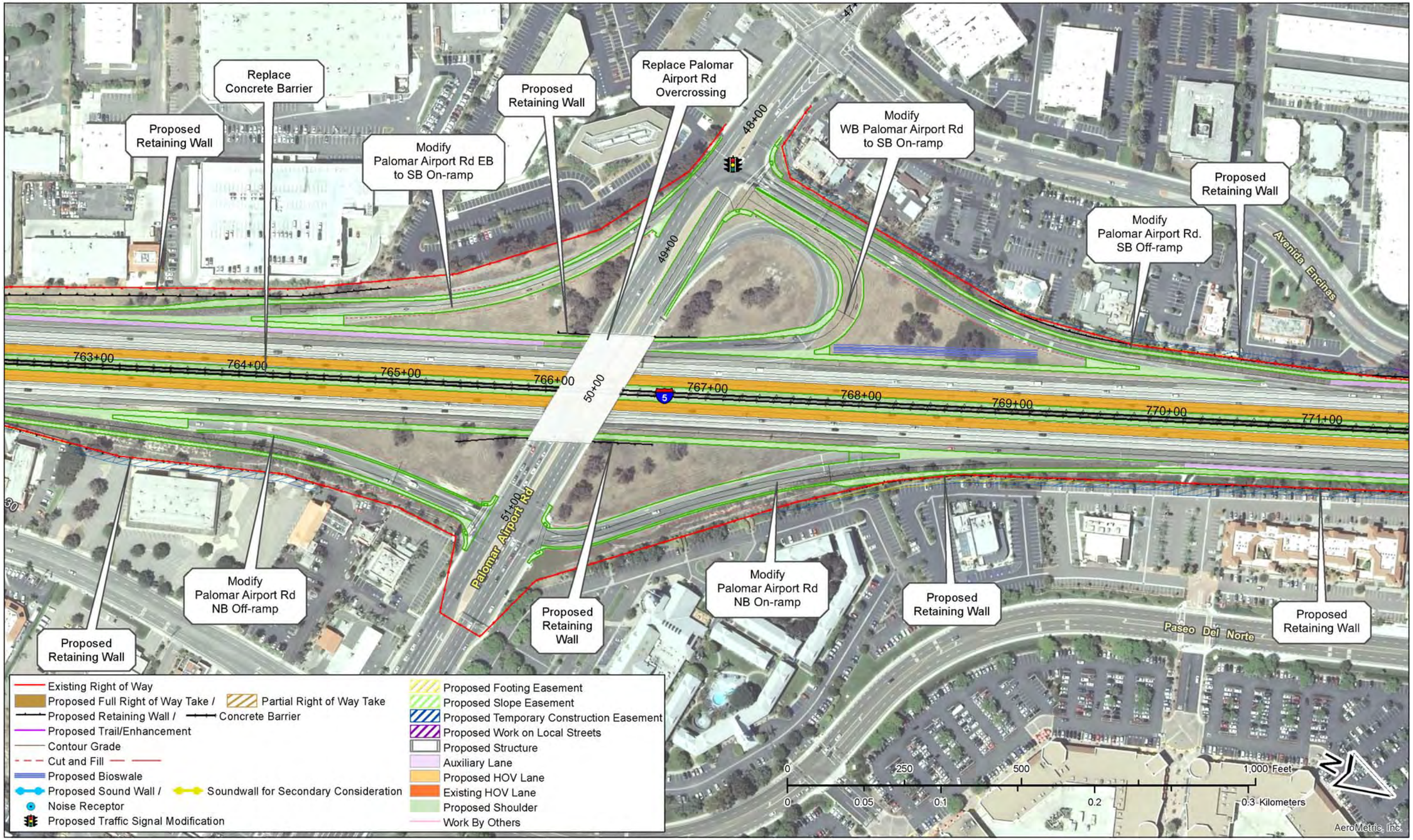


Figure 2-2.3, Sheet 47 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

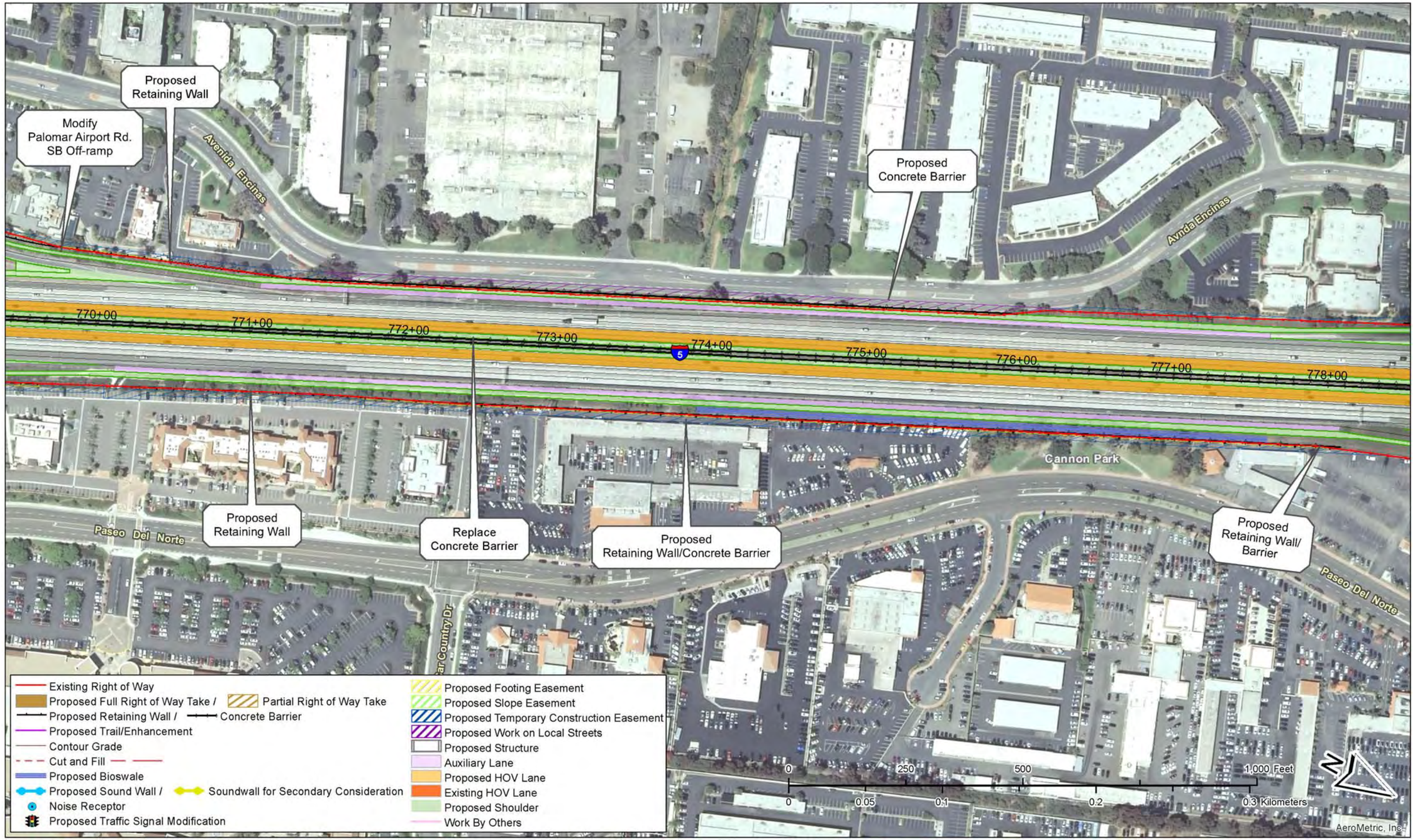


Figure 2-2.3, Sheet 48 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

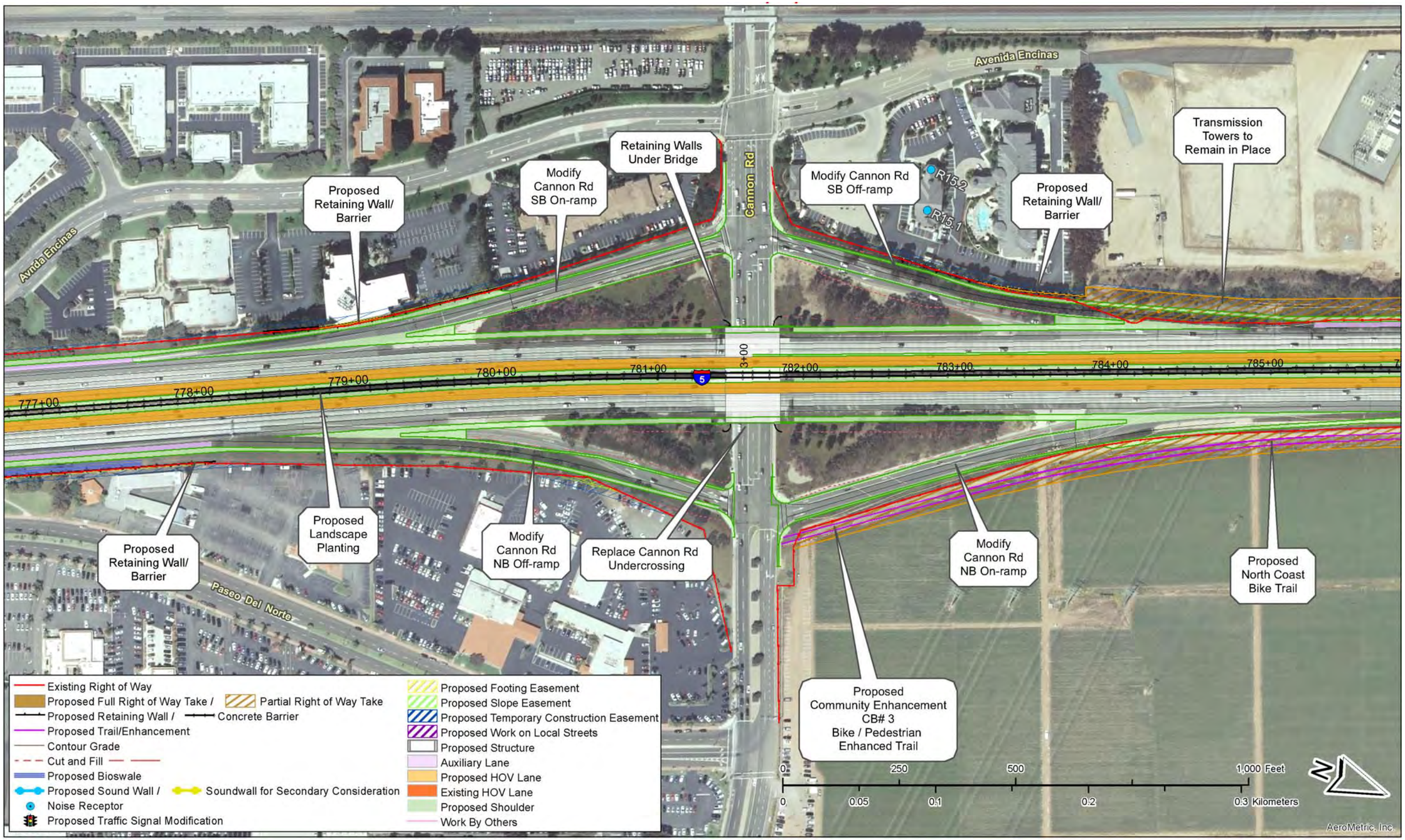


Figure 2-2.3, Sheet 49 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

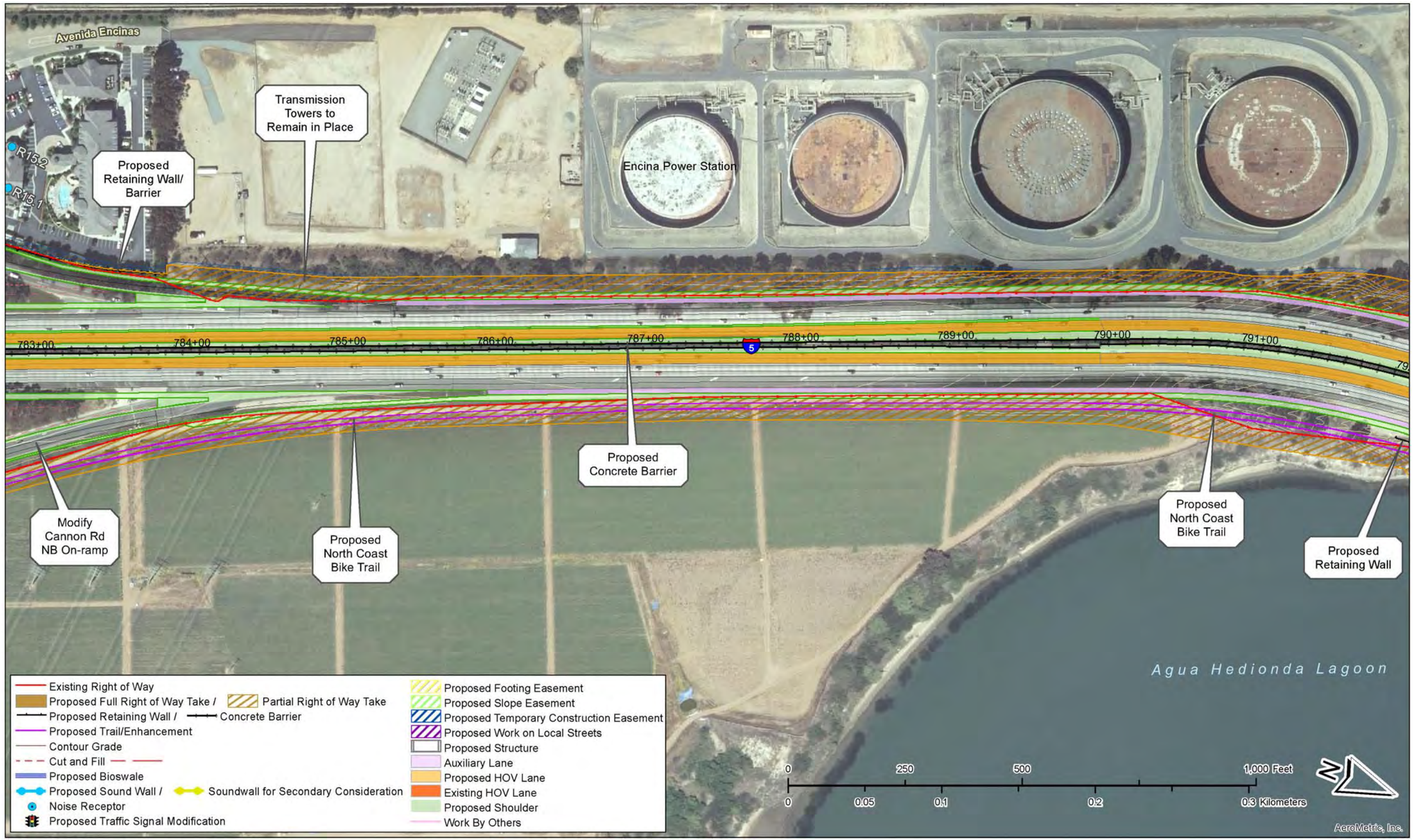


Figure 2-2.3, Sheet 50 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

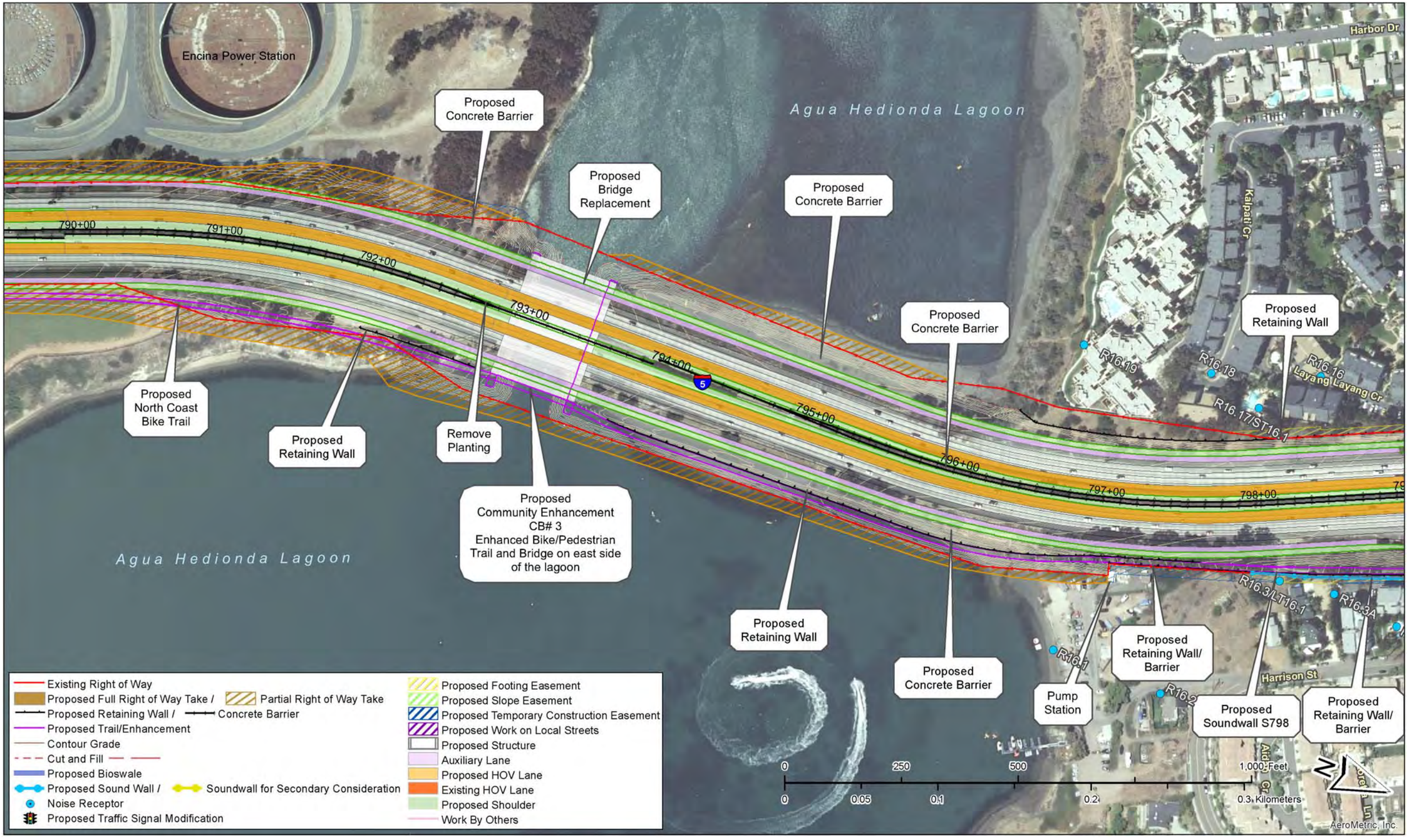


Figure 2-2.3, Sheet 51 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

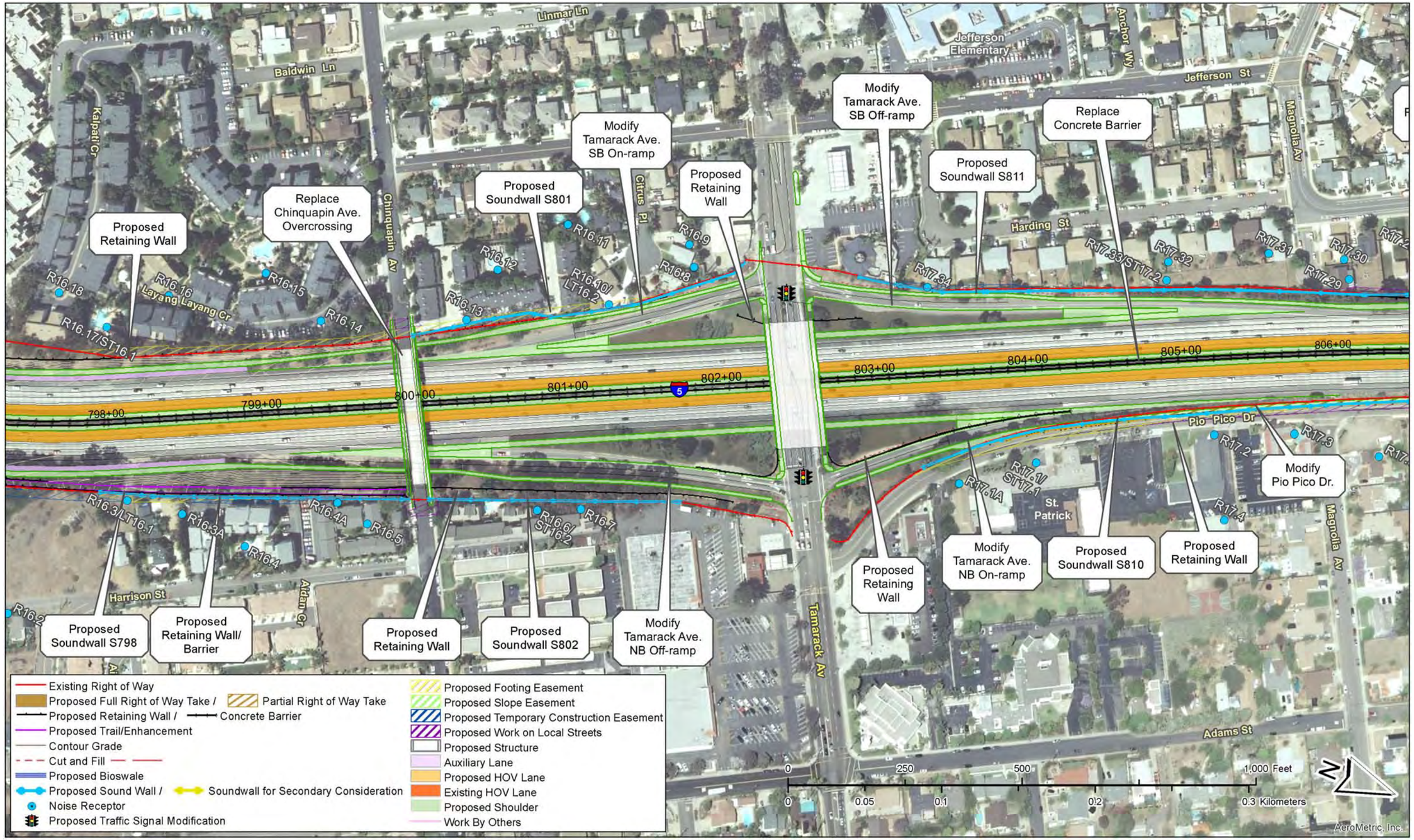


Figure 2-2.3, Sheet 52 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

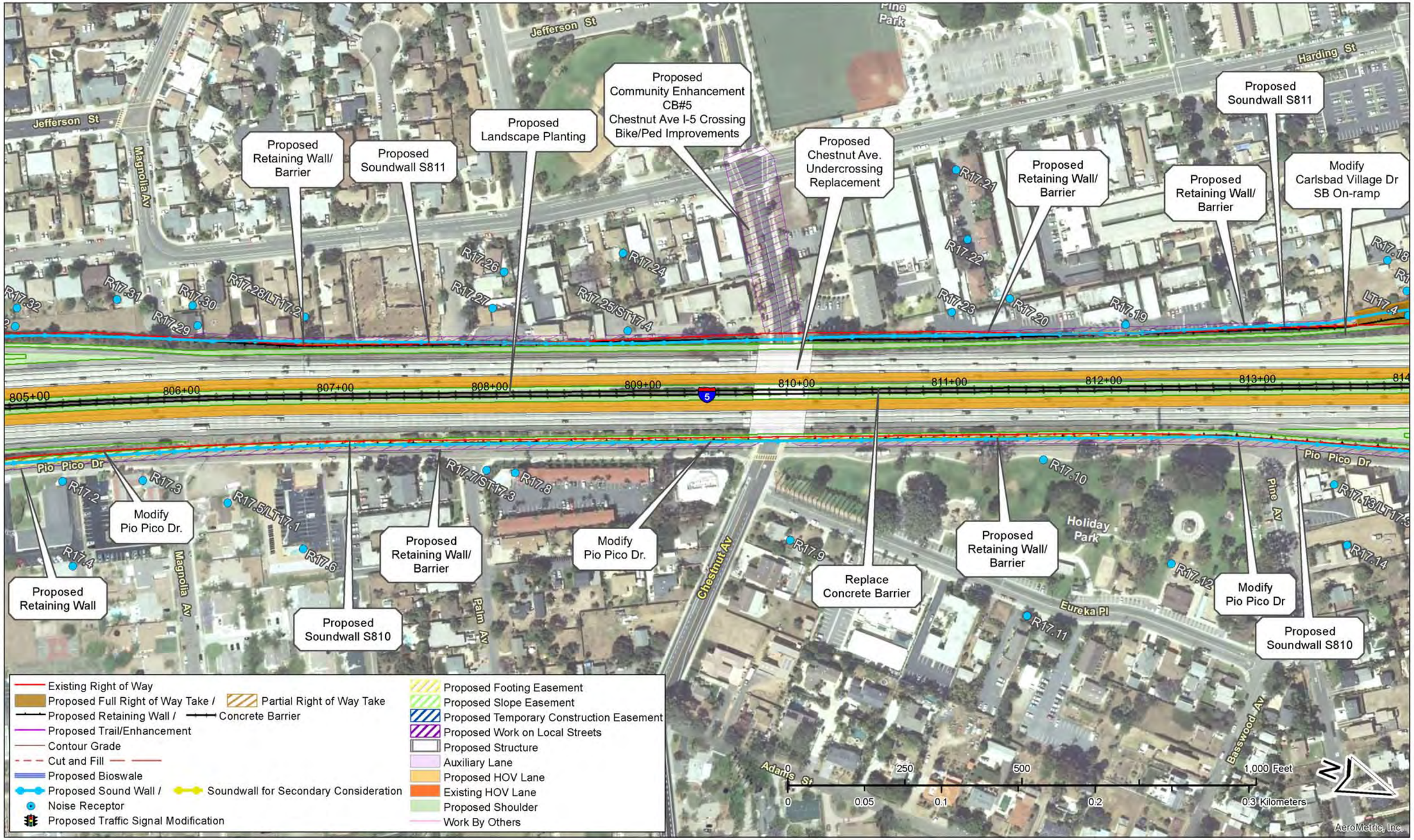


Figure 2-2.3, Sheet 53 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

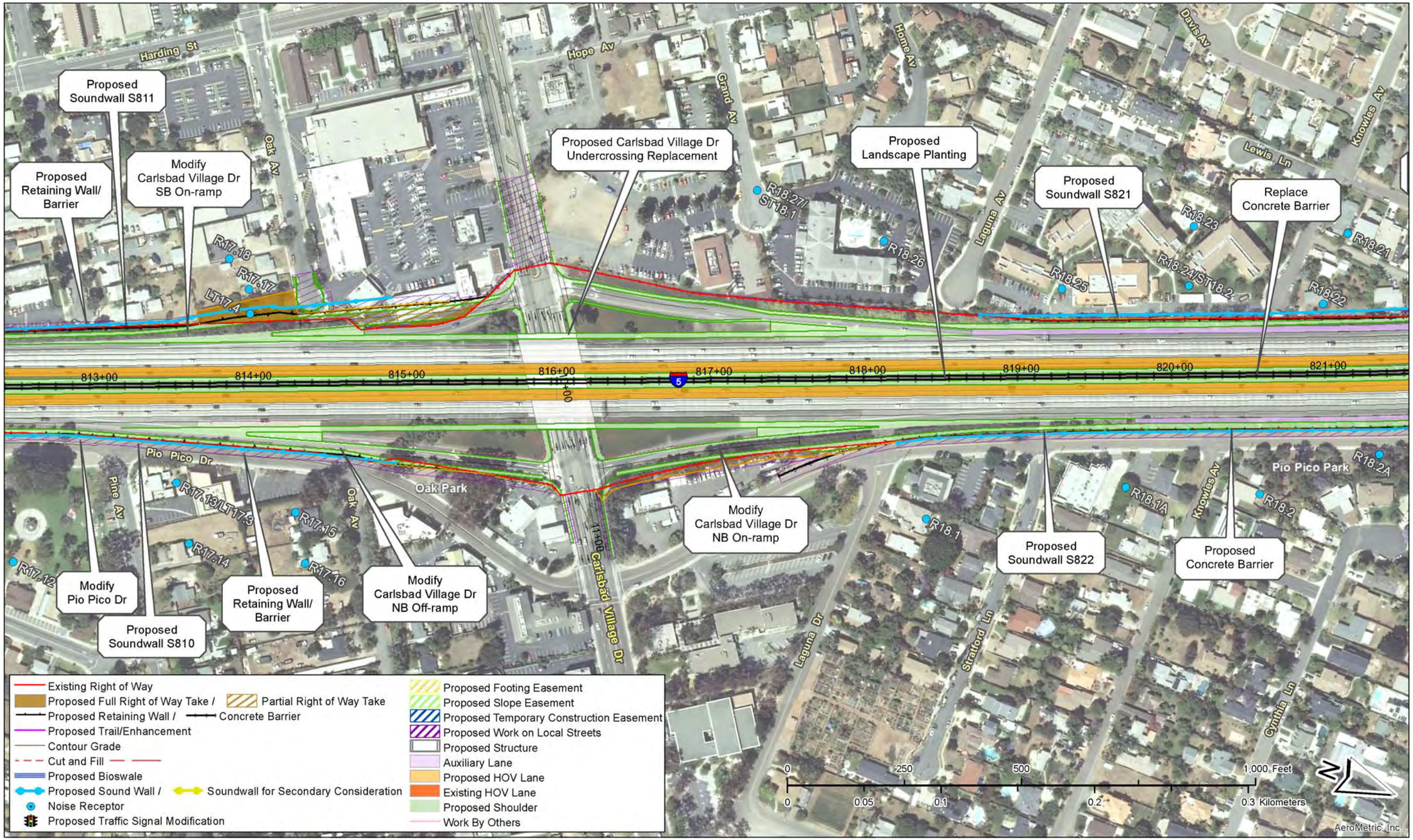


Figure 2-2.3, Sheet 54 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

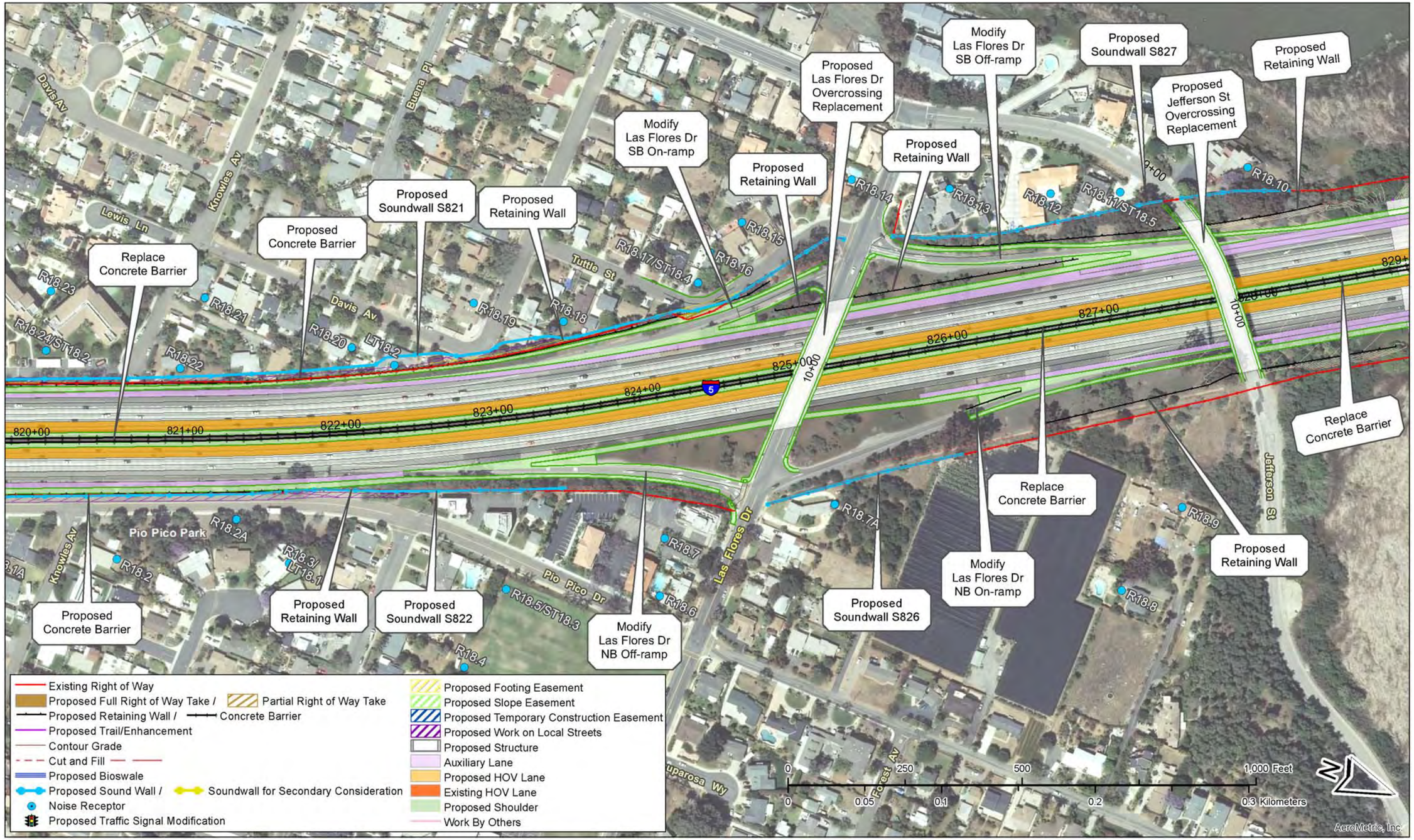


Figure 2-2.3, Sheet 55 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

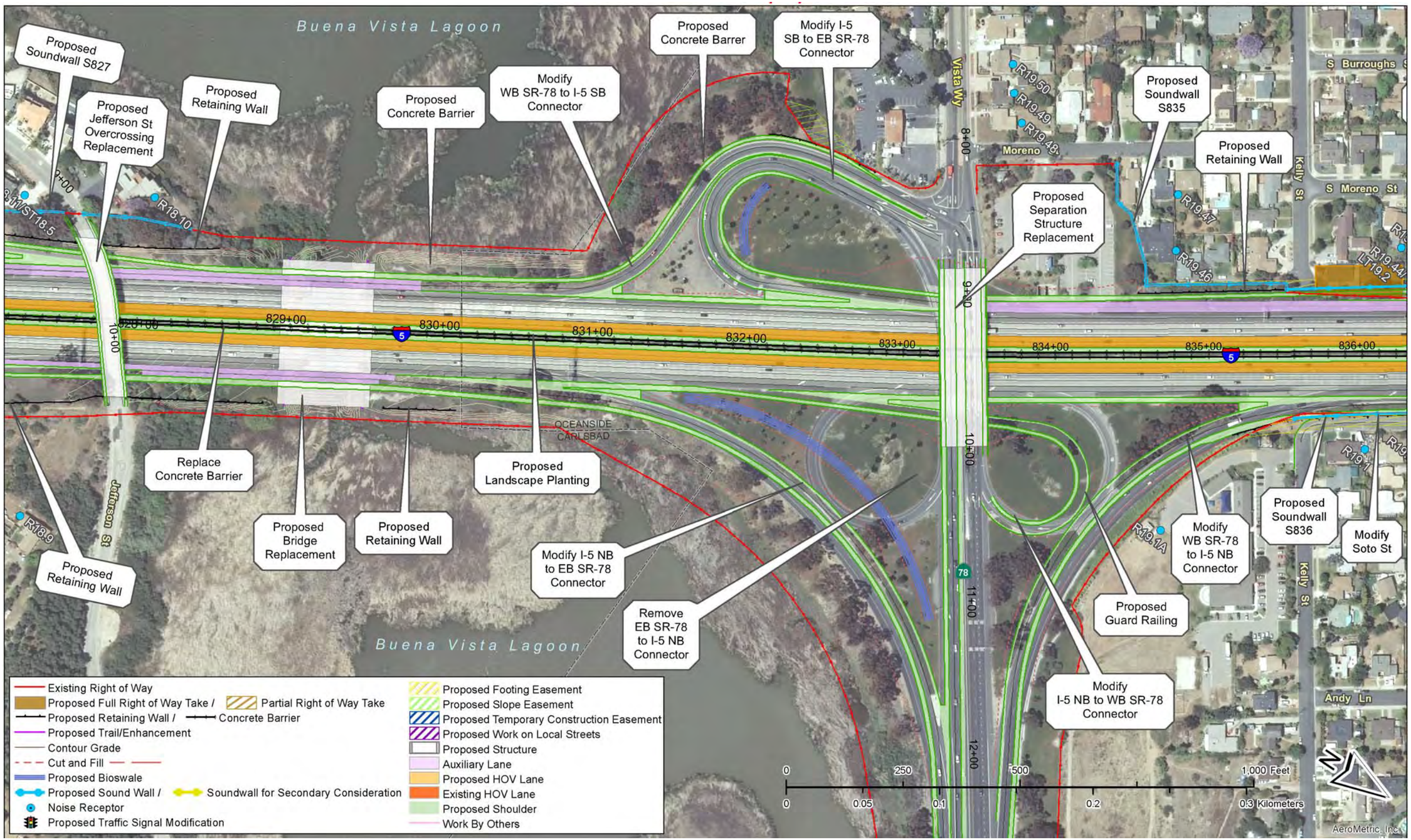


Figure 2-2.3, Sheet 56 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

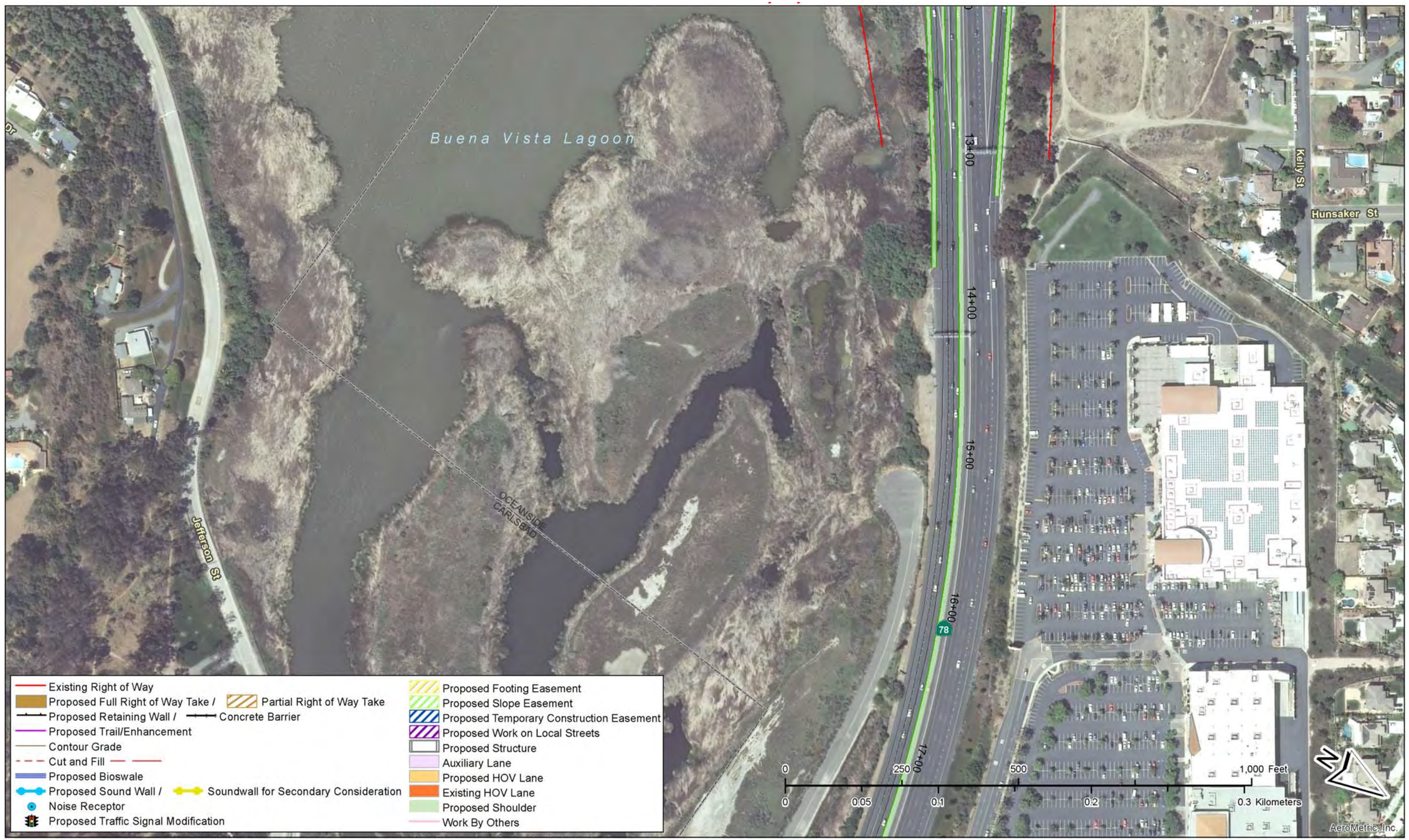


Figure 2-2.3, Sheet 57 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

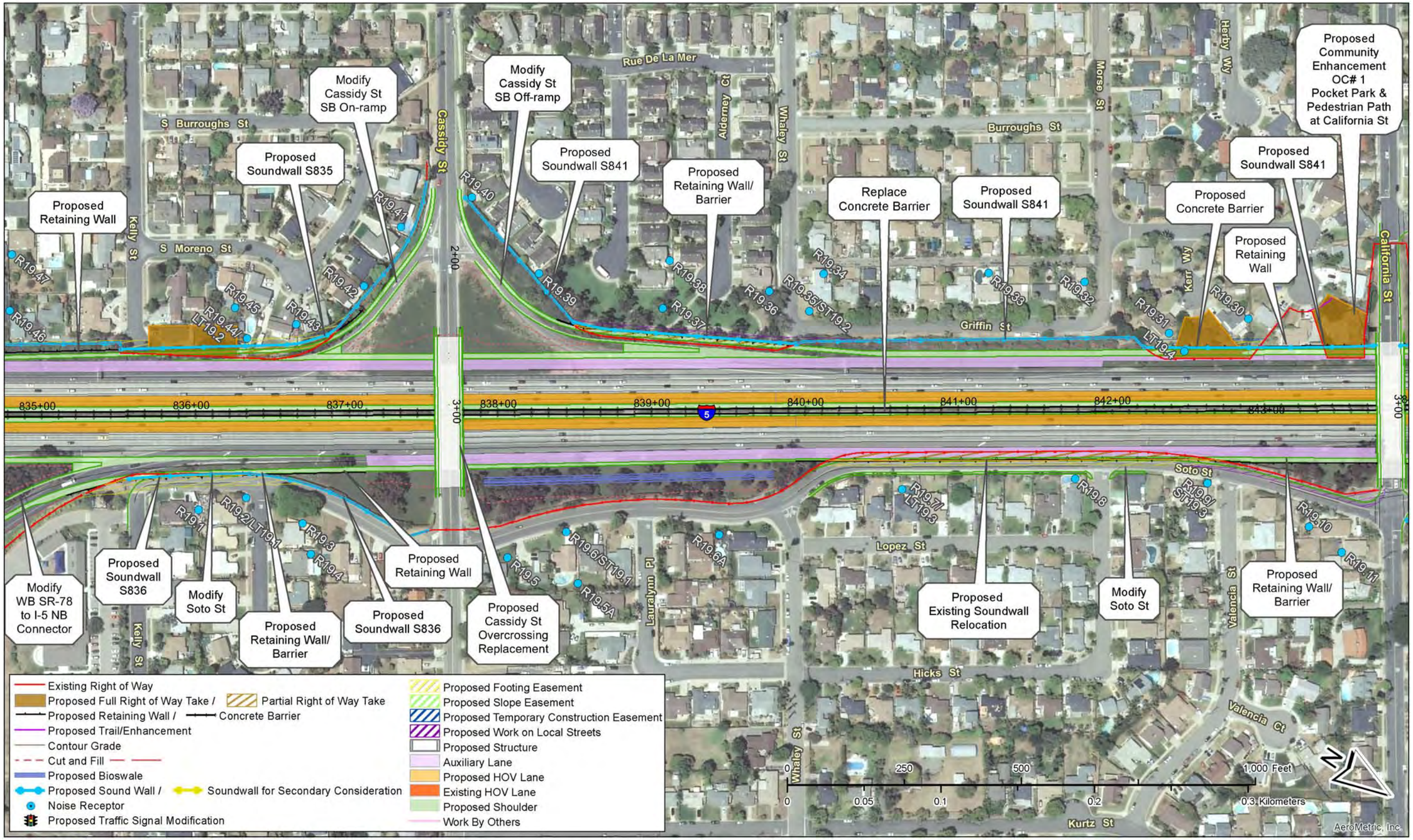


Figure 2-2.3, Sheet 58 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

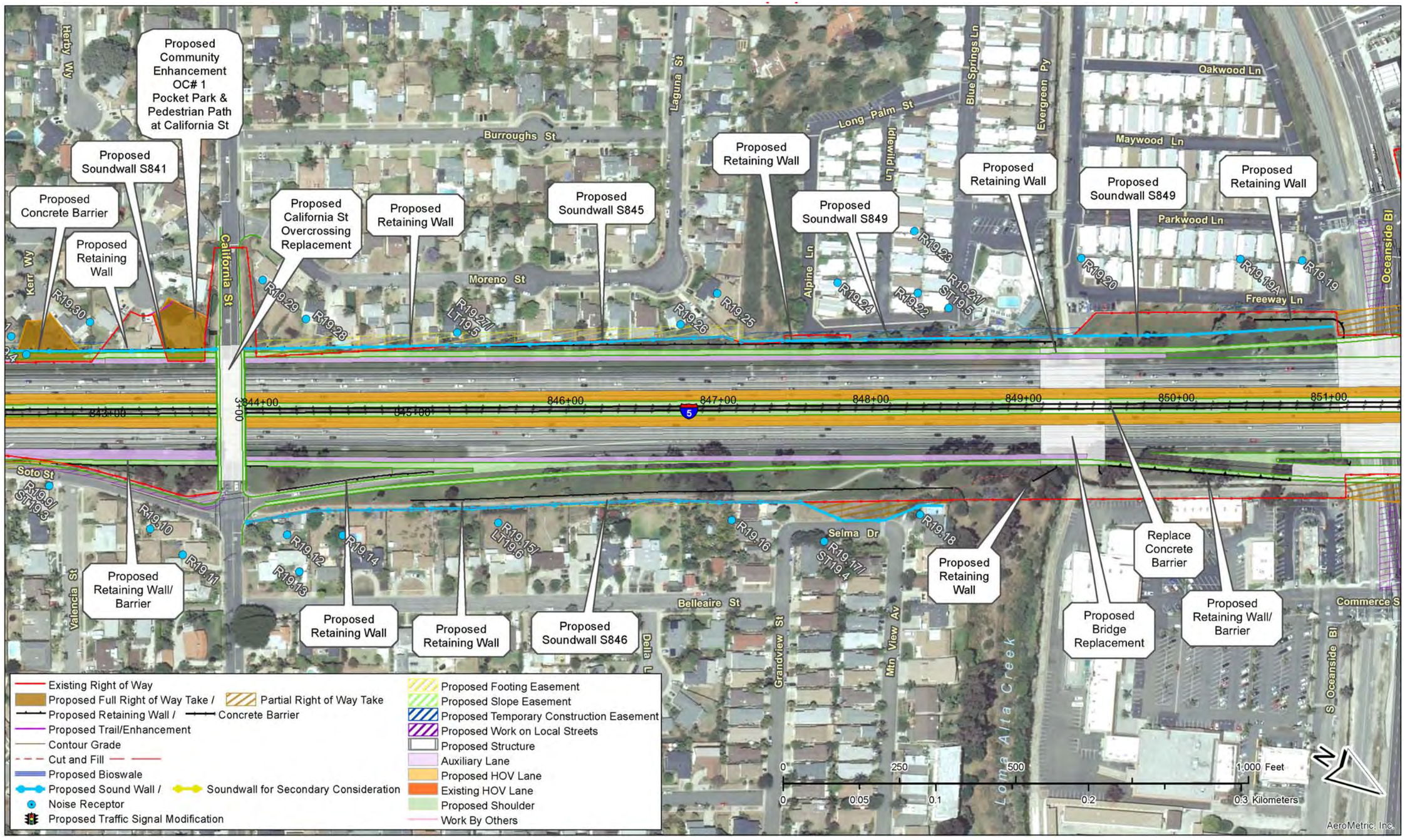


Figure 2-2.3, Sheet 59 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

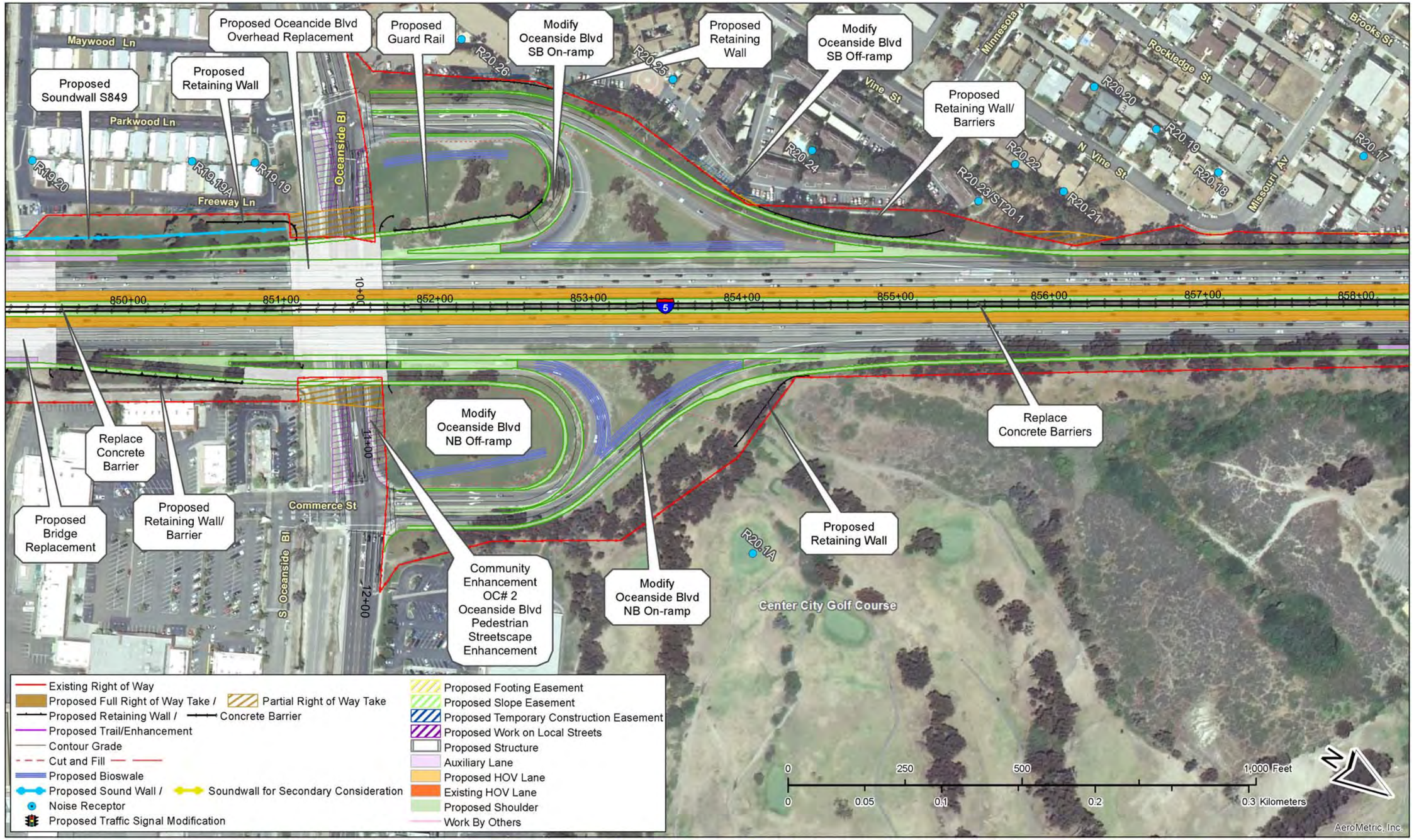


Figure 2-2.3, Sheet 60 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

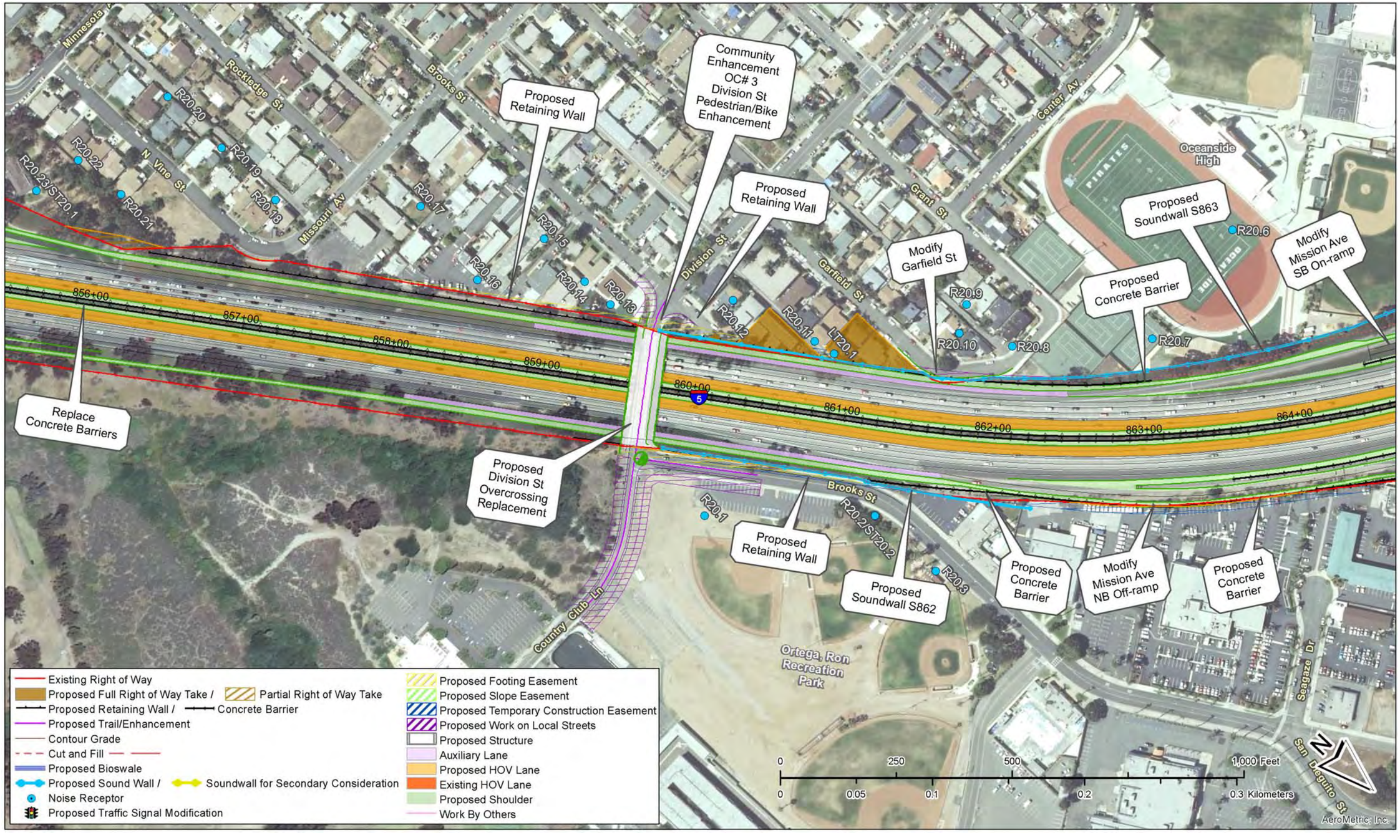


Figure 2-2.3, Sheet 61 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

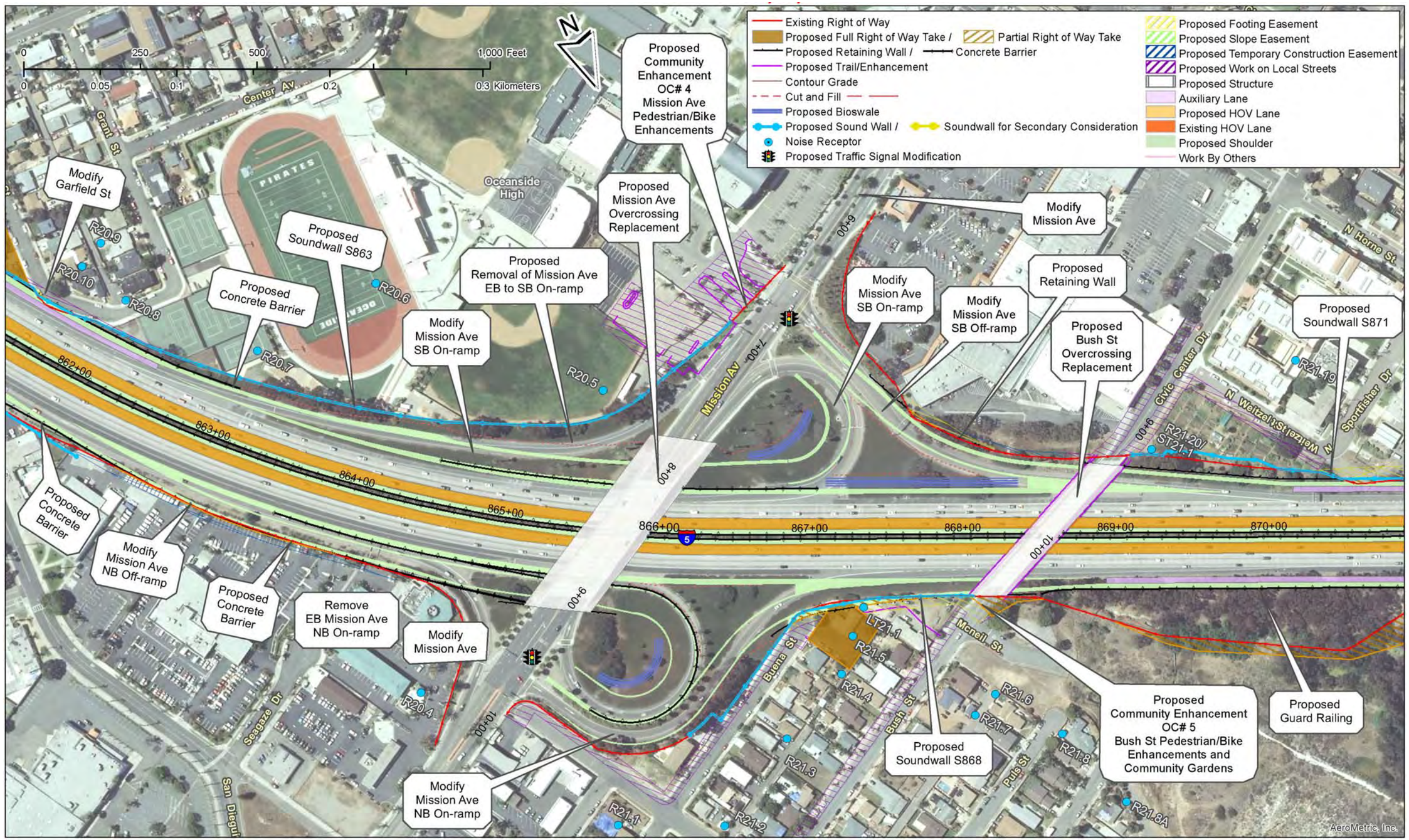


Figure 2-2.3, Sheet 62 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

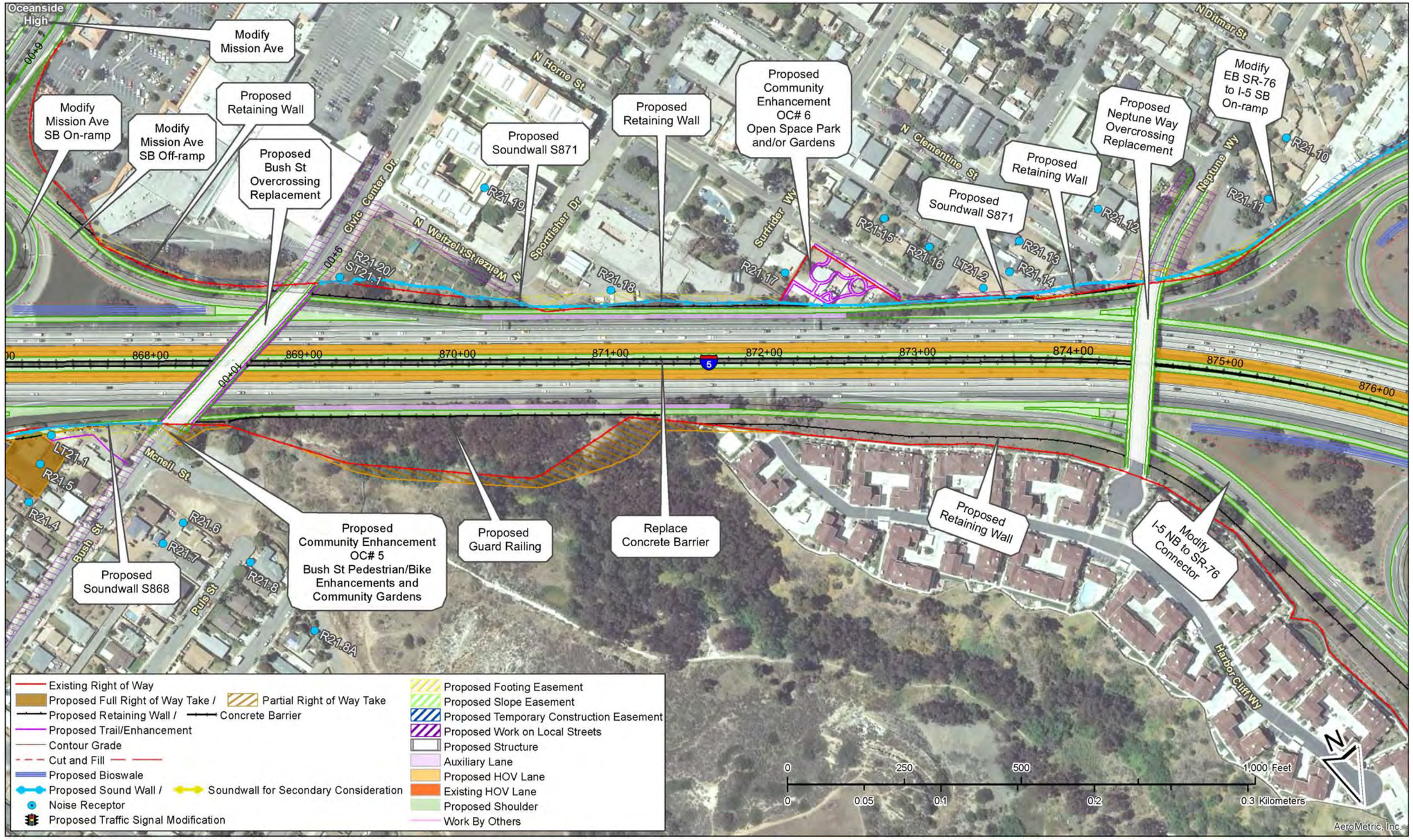


Figure 2-2.3, Sheet 63 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

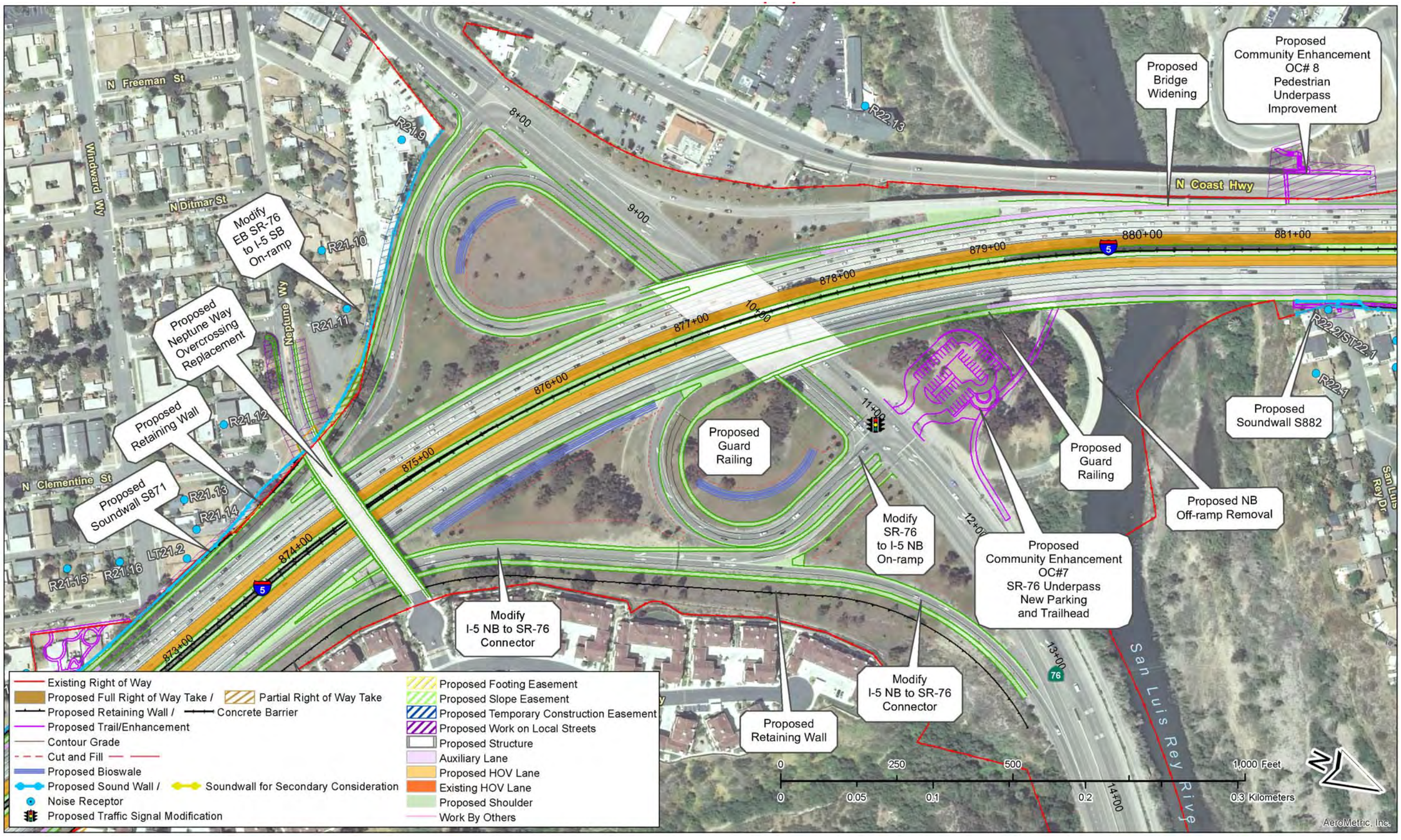


Figure 2-2.3, Sheet 64 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

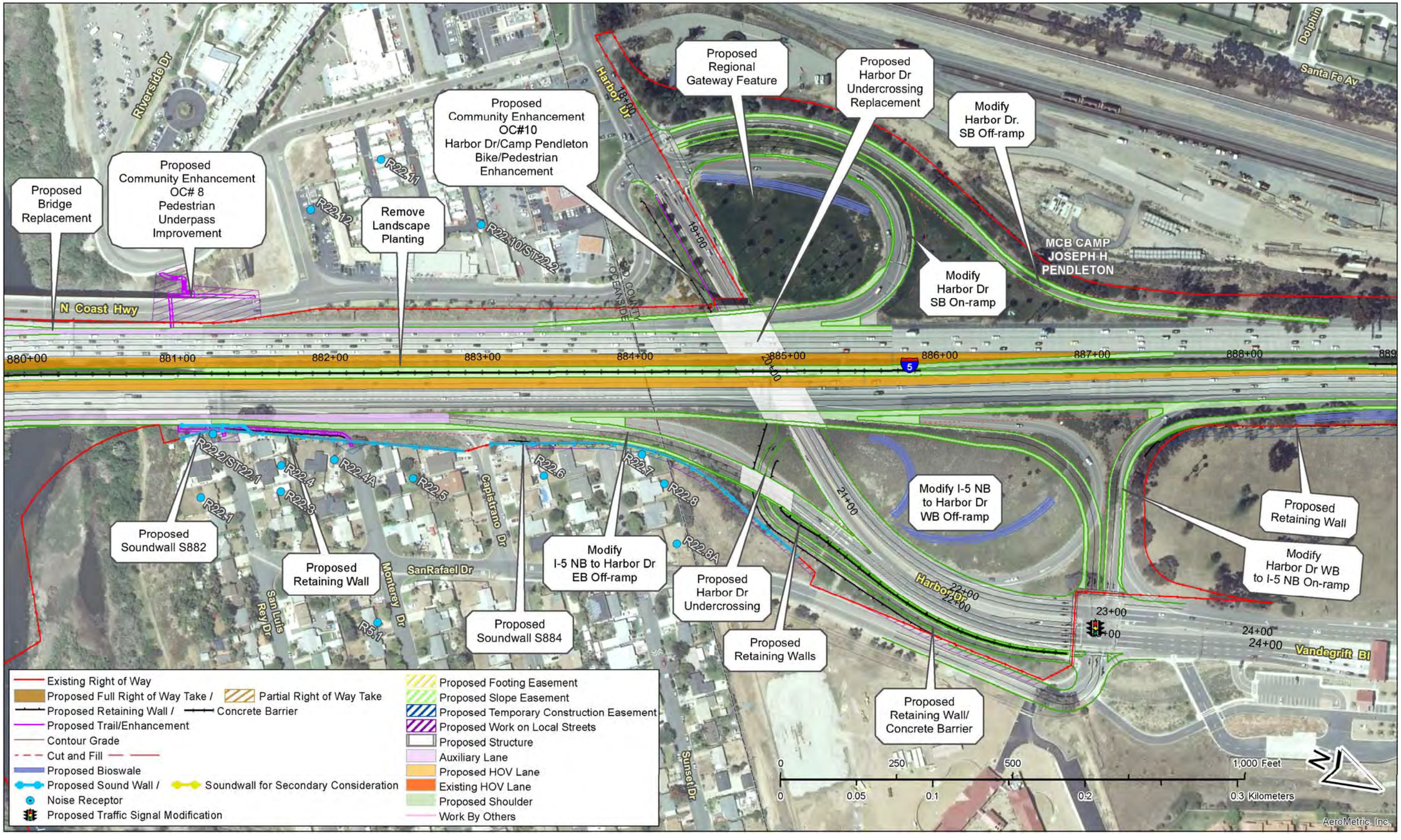


Figure 2-2.3, Sheet 65 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

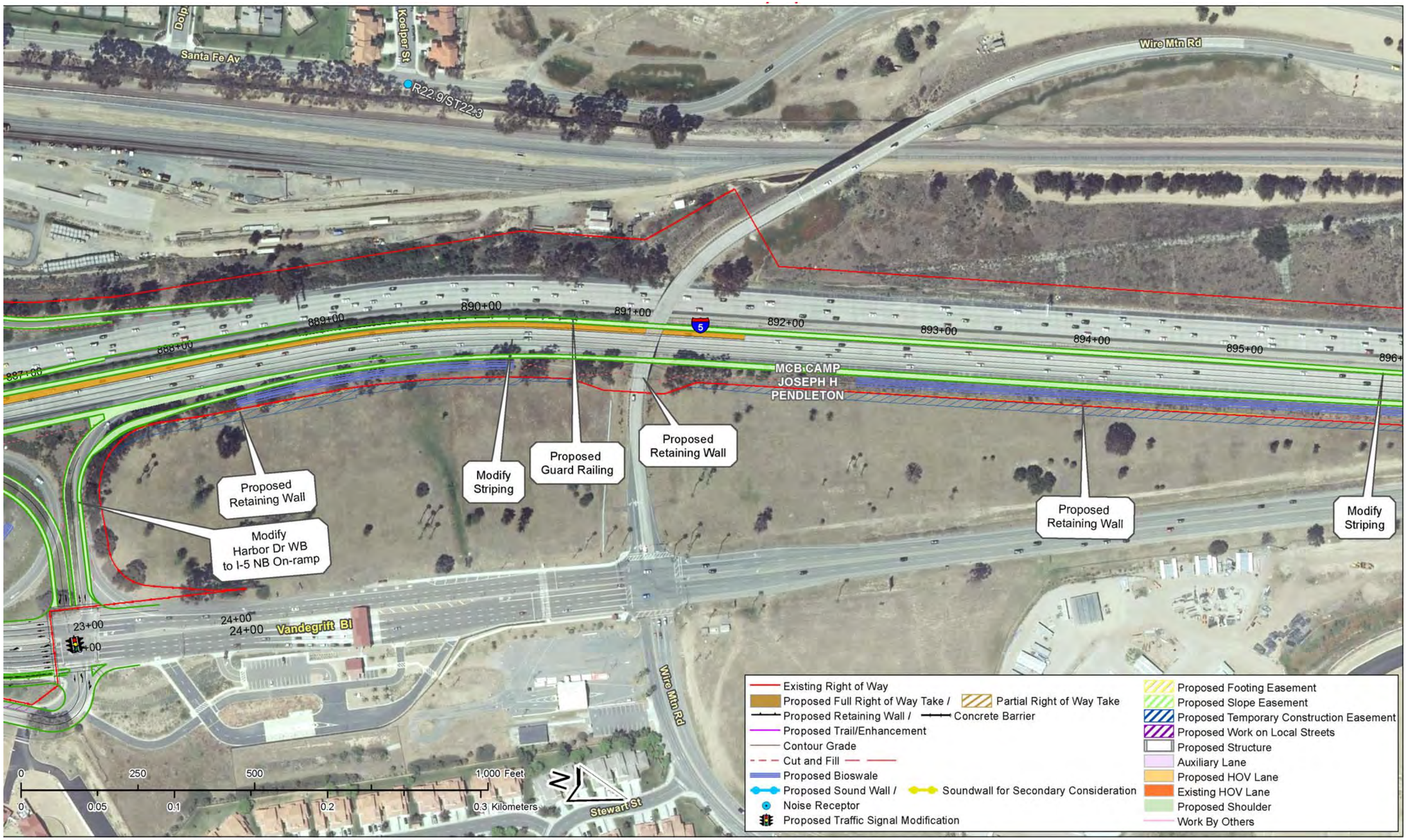


Figure 2-2.3, Sheet 66 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

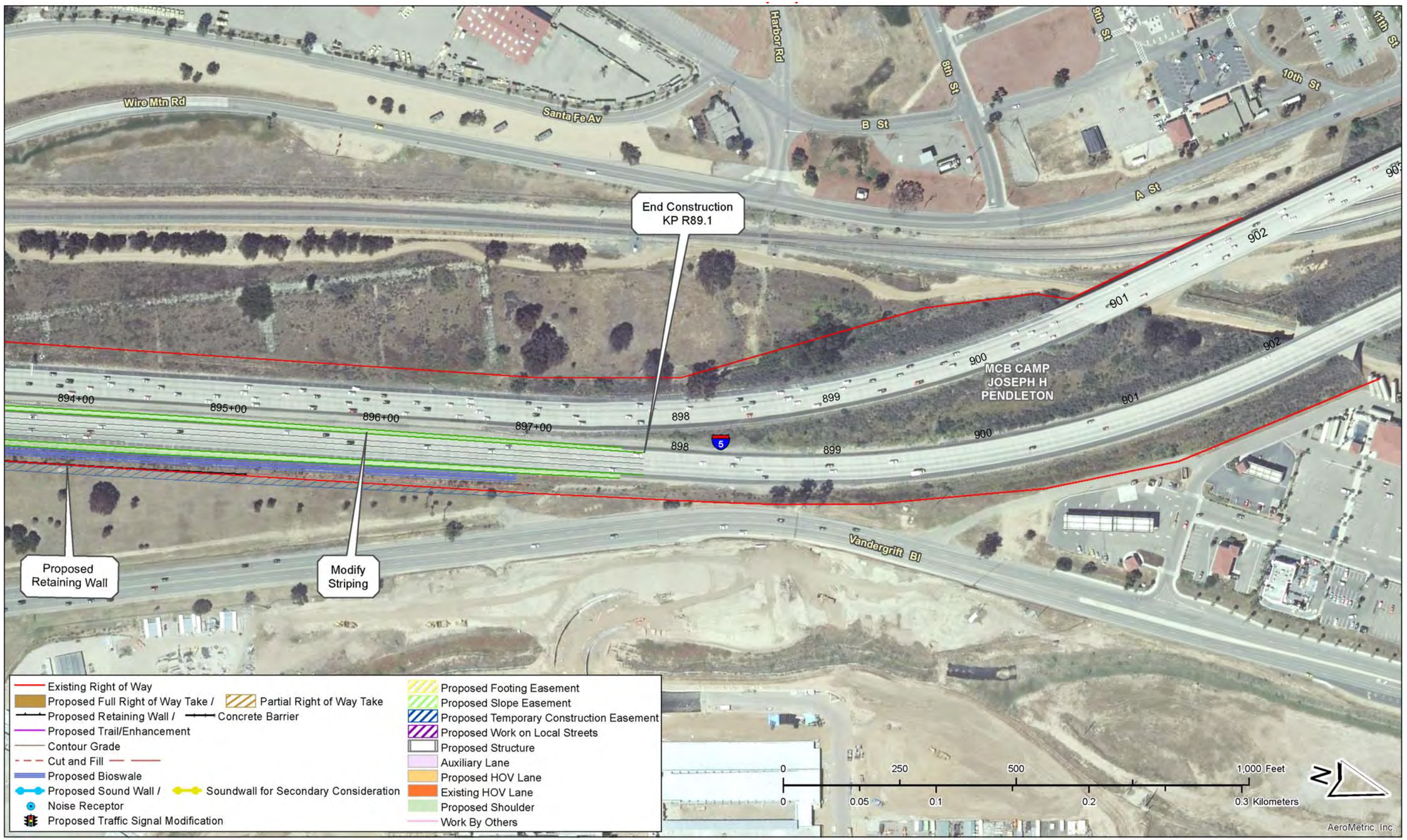


Figure 2-2.3, Sheet 67 of 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)
Soundwalls for secondary consideration are not part of the project. See *Executive Summary* (*ES.5.15 Noise*).

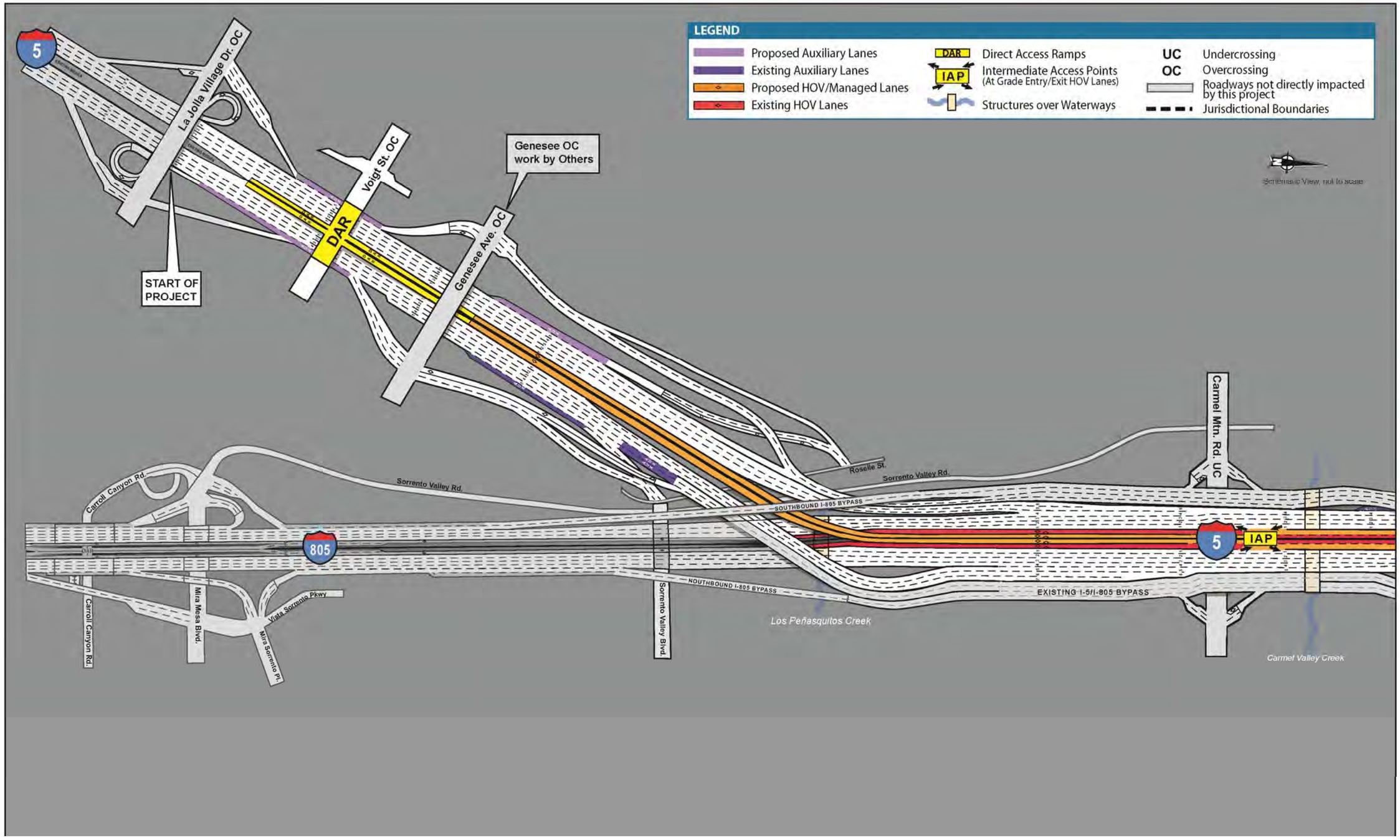


Figure 2-2.8a: I-5 NCC Project Configuration

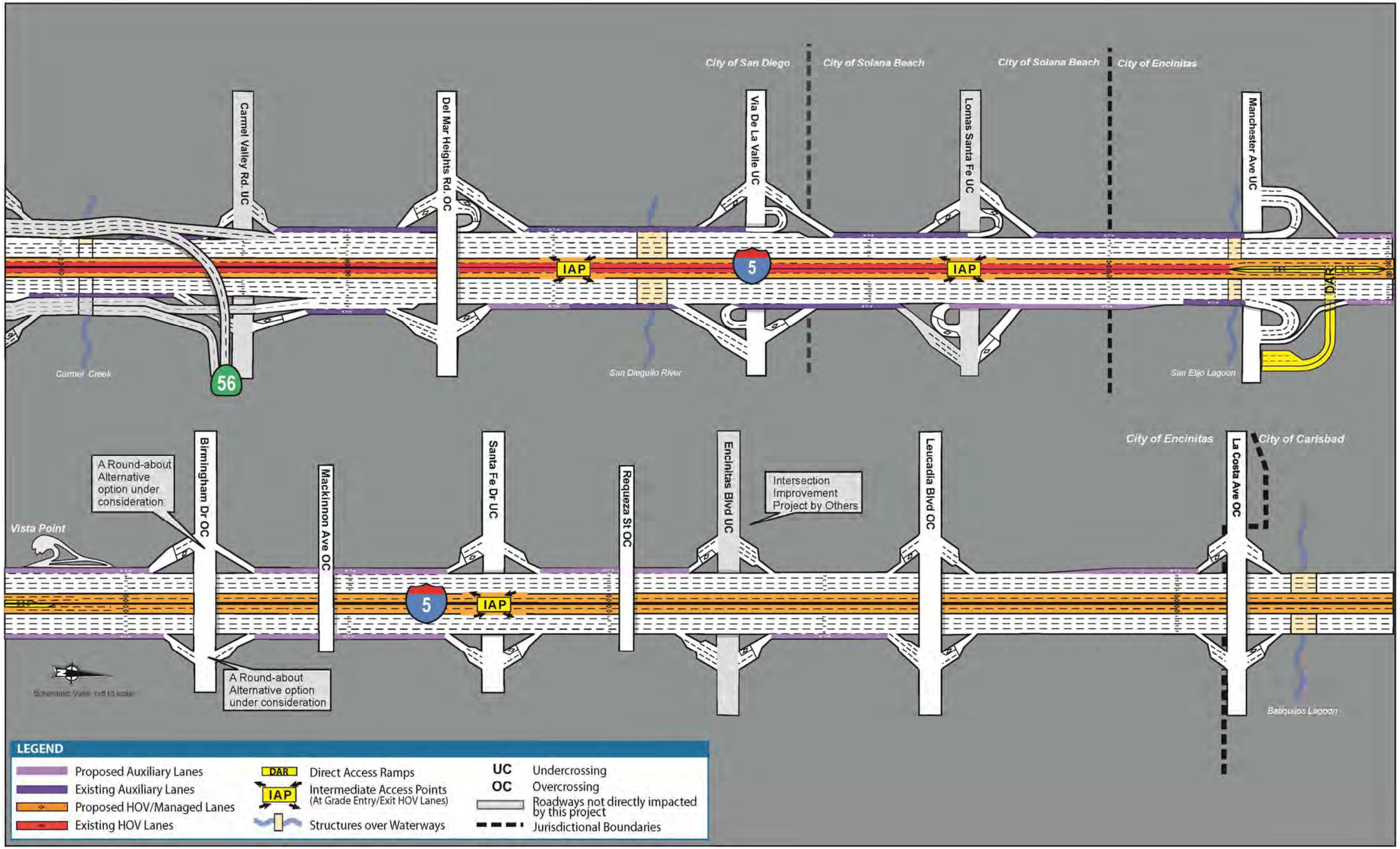


Figure 2-2.8b: I-5 NCC Project Configuration

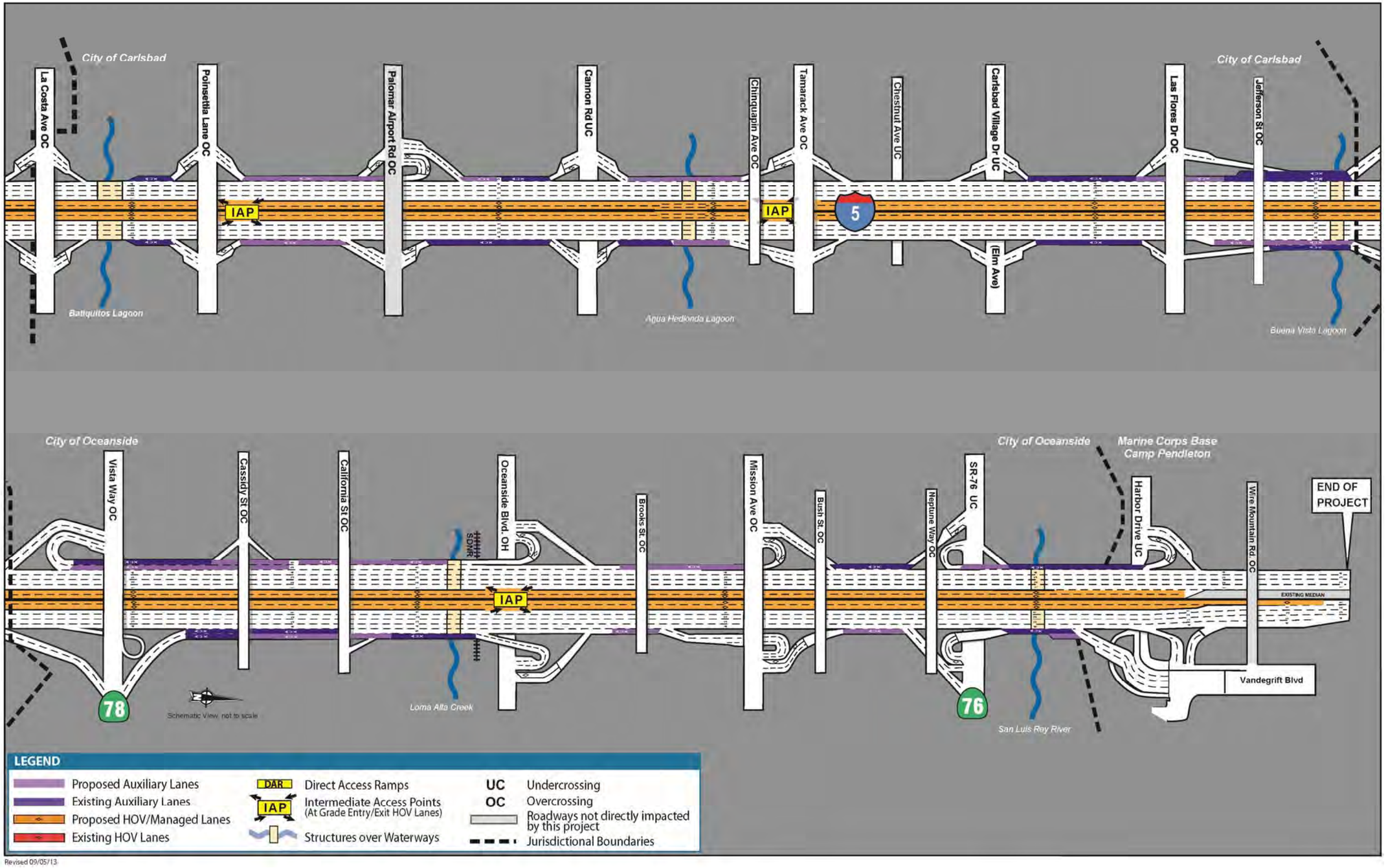
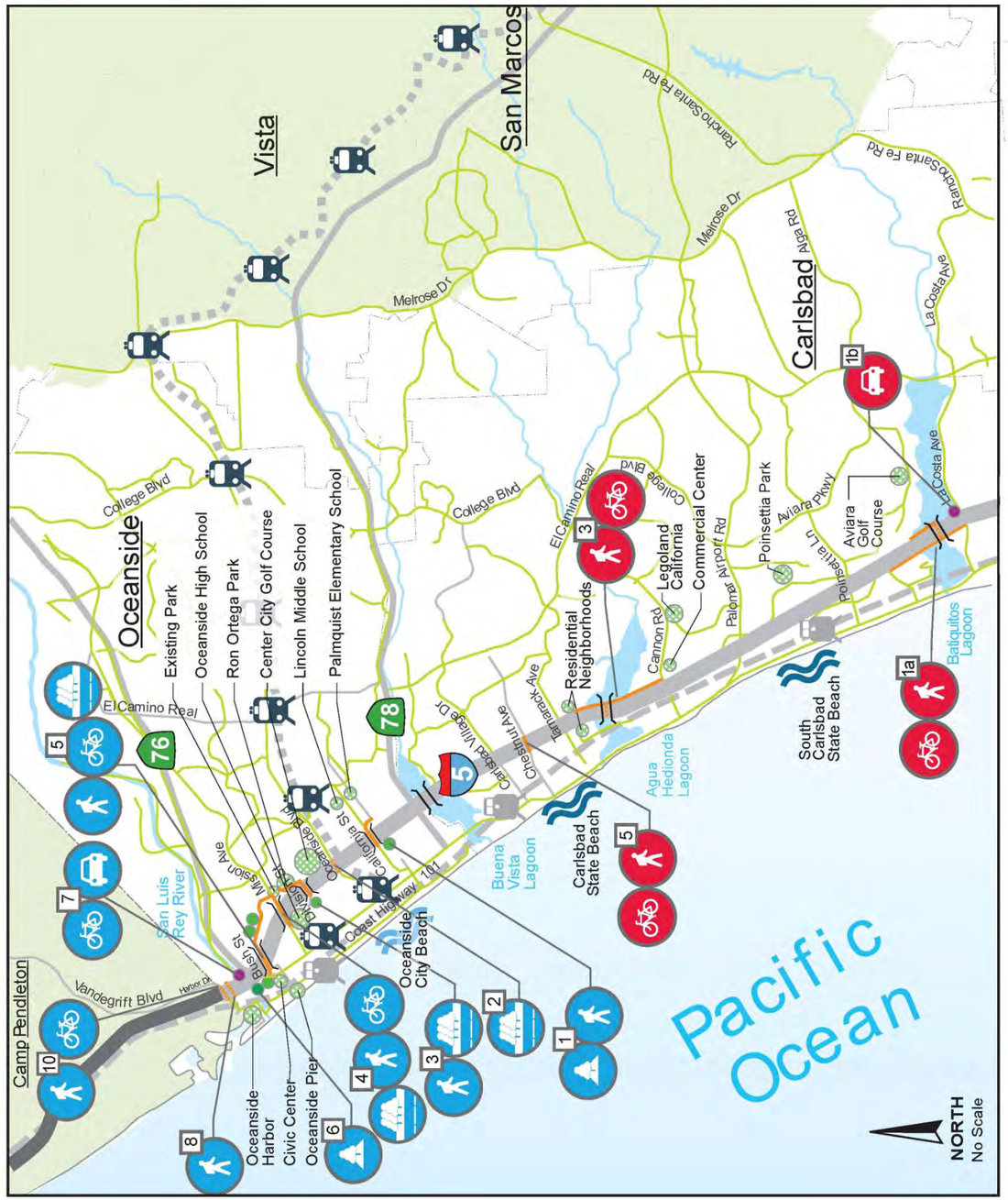


Figure 2-2.8c: I-5 NCC Project Configuration

Figure 2-3.1a: Community Enhancements Overview –South



Source: Caltrans, I-5 NCC Enhancement Plan, revised 9/4/2013

Carlsbad

Project 1a Bicycle/Pedestrian Enhanced Trail and Bridge on west side of I-5 at Batiquitos Lagoon (Phase 2)

1b Park and Ride Enhancement at La Costa Avenue (Phase 2)

Project 3 Bicycle/Pedestrian Enhanced Trail and Bridge on east side of I-5 at Agua Hedionda Lagoon (Phase 3)

Project 5 Chestnut Ave I-5 Crossing Bicycle/Pedestrian Improvement (Phase 3)

Oceanside

Project 1 Pocket Park and Pedestrian Path at California Street (Phase 3)

Project 2 Oceanside Blvd Pedestrian Streetscape Enhancement (Phase 3)

Project 3 Division Street Bicycle/Pedestrian Enhancements (Phase 3)

Project 4 Mission Avenue Bicycle/Pedestrian Enhancements (Phase 3)

Project 5 Bush Street Bicycle/Pedestrian Enhancements and Community Gardens (Phase 3)

Project 6 Community Open Space Park and/or Community Gardens (Phase 3)

Project 7 SR-76 Underpass: New Parking and Trailhead (Phase 3)

Project 8 Pedestrian Underpass Improvements north of San Luis Rey River (Phase 3)

Project 10 Harbor Drive/Camp Pendleton Bicycle and Pedestrian Enhancements (Phase 3)

Figure 2-3.1b: Community Enhancements Overview – North

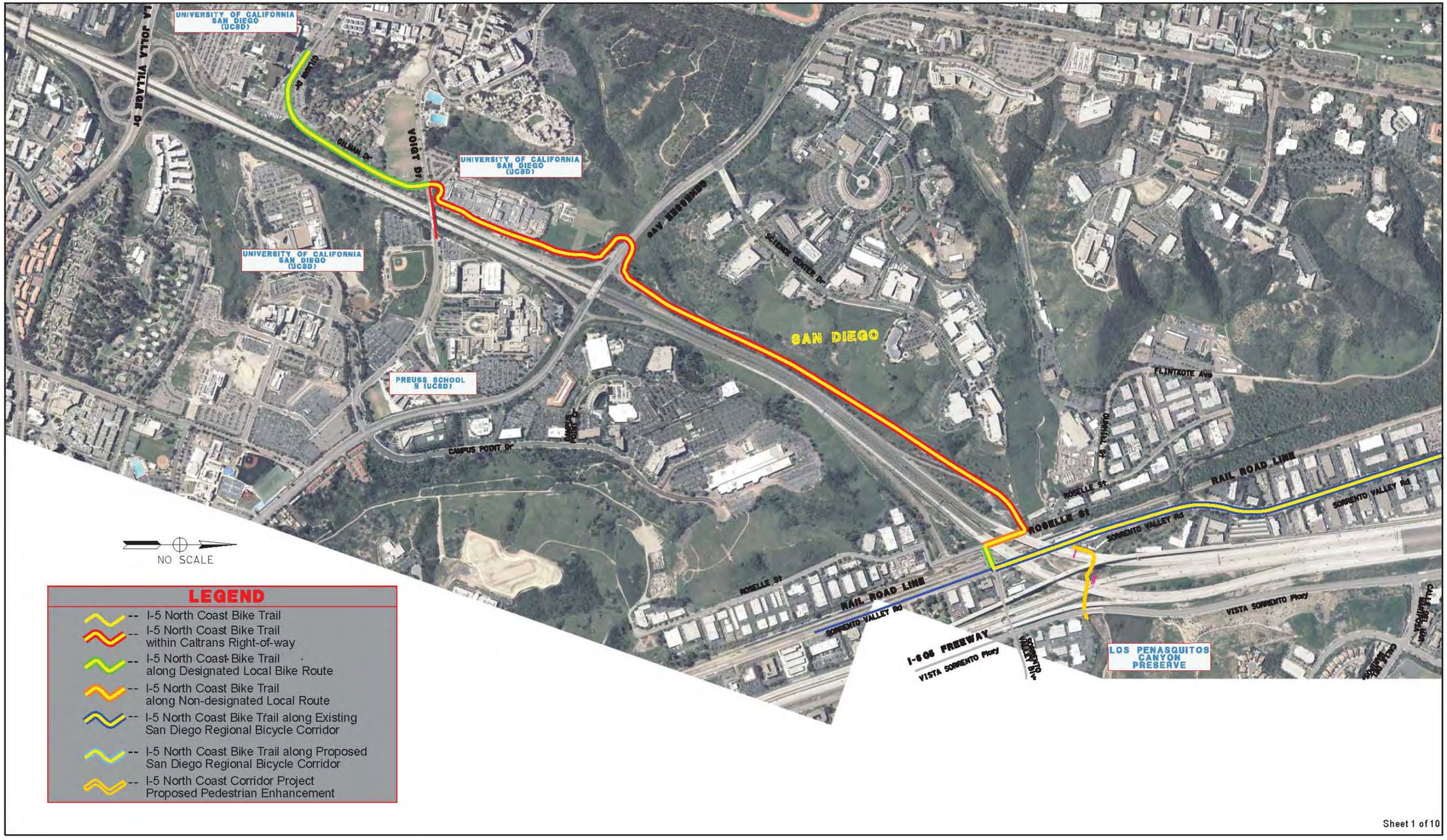


Figure 2-3.4a: North Coast Bike Trail Elements

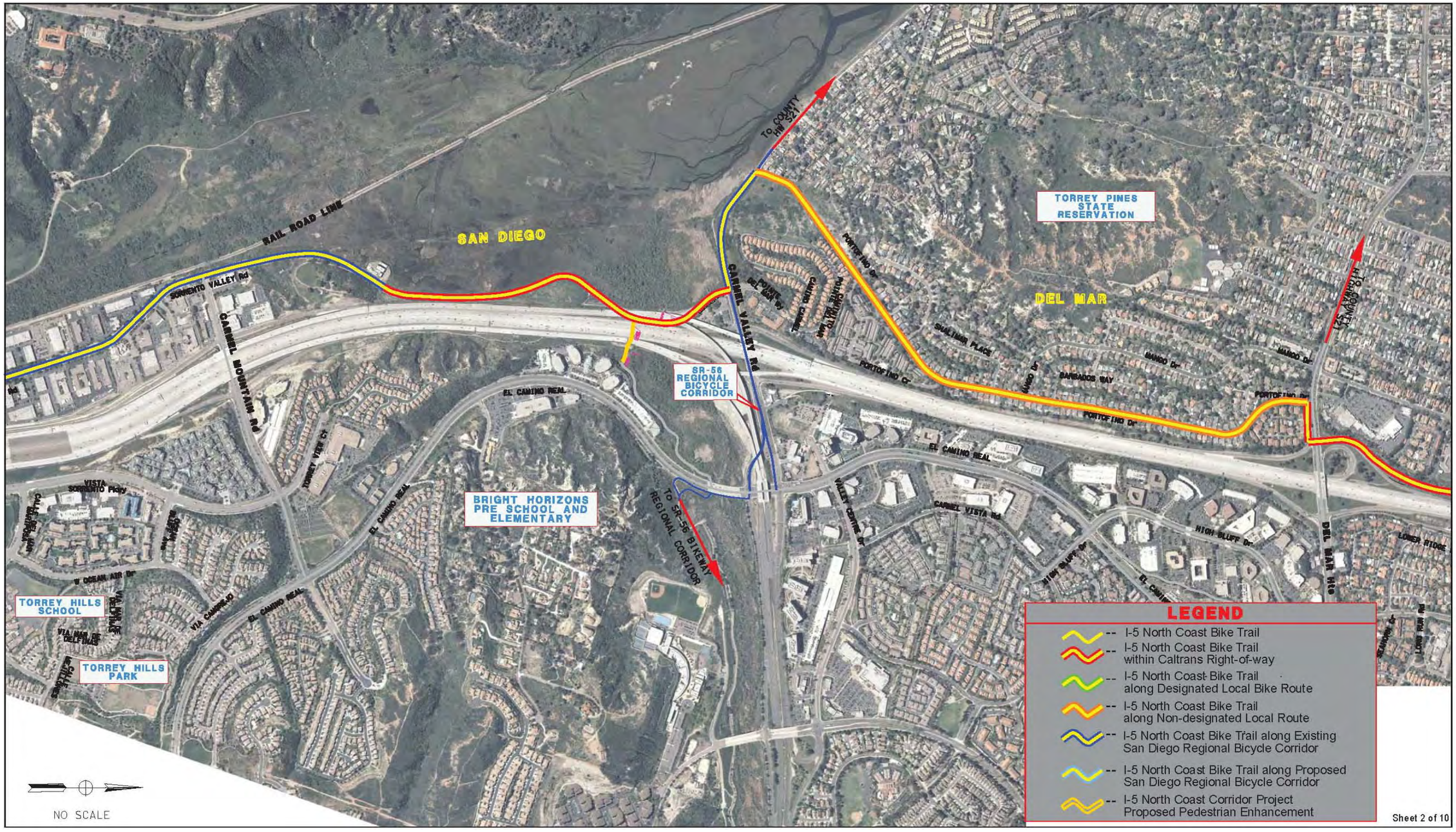


Figure 2-3.4b: North Coast Bike Trail Elements

Figure 2-3.4c: North Coast Bike Trail Elements

Figure 2-3.4d: North Coast Bike Trail Elements

Figure 2-3.4e: North Coast Bike Trail Elements

Figure 2-3.4f: North Coast Bike Trail Elements

Figure 2-3.4g: North Coast Bike Trail Elements

Figure 2-3.4h: North Coast Bike Trail Elements

Figure 2-3.4i: North Coast Bike Trail Elements

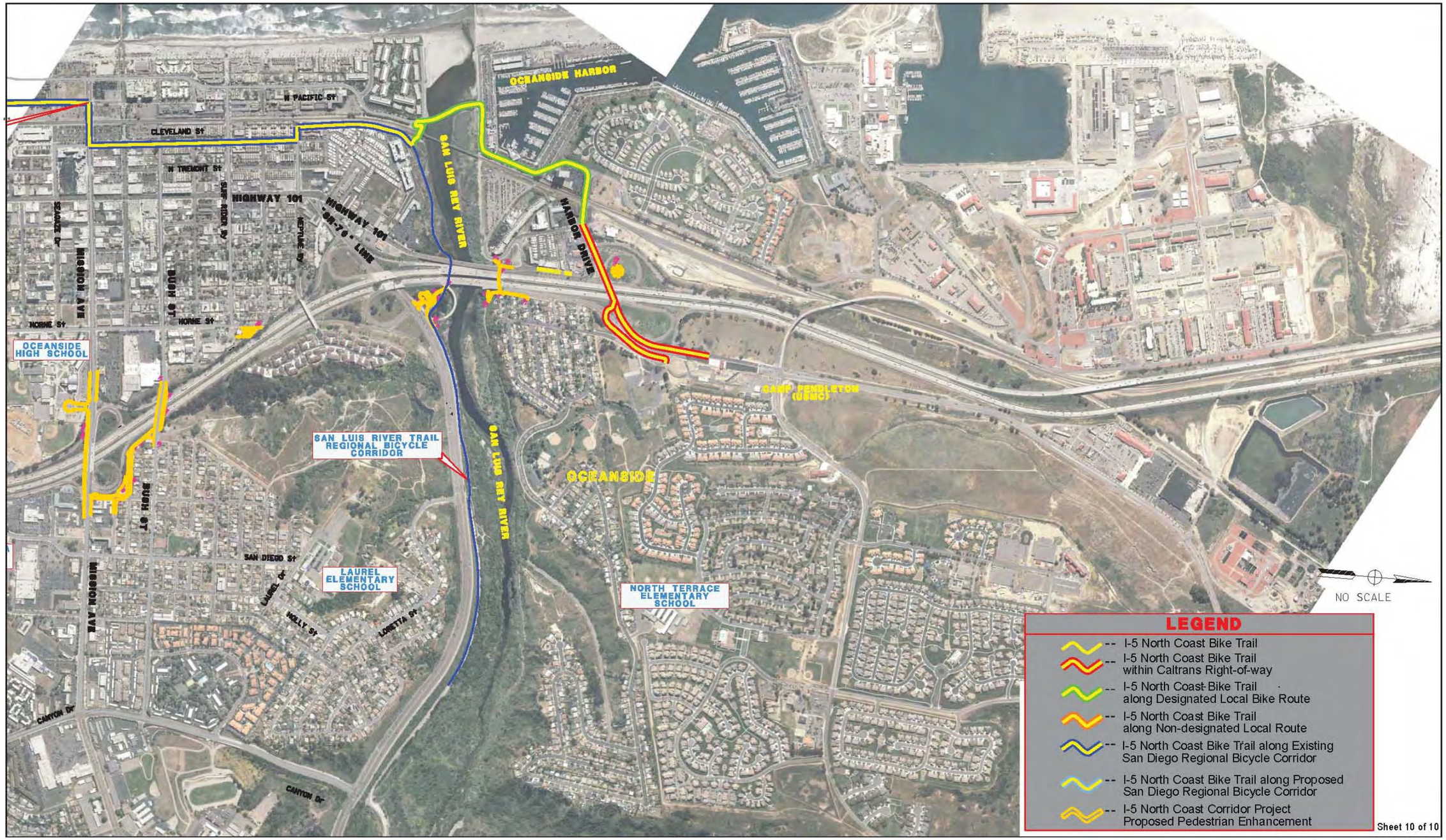


Figure 2-3.4j: North Coast Bike Trail Elements

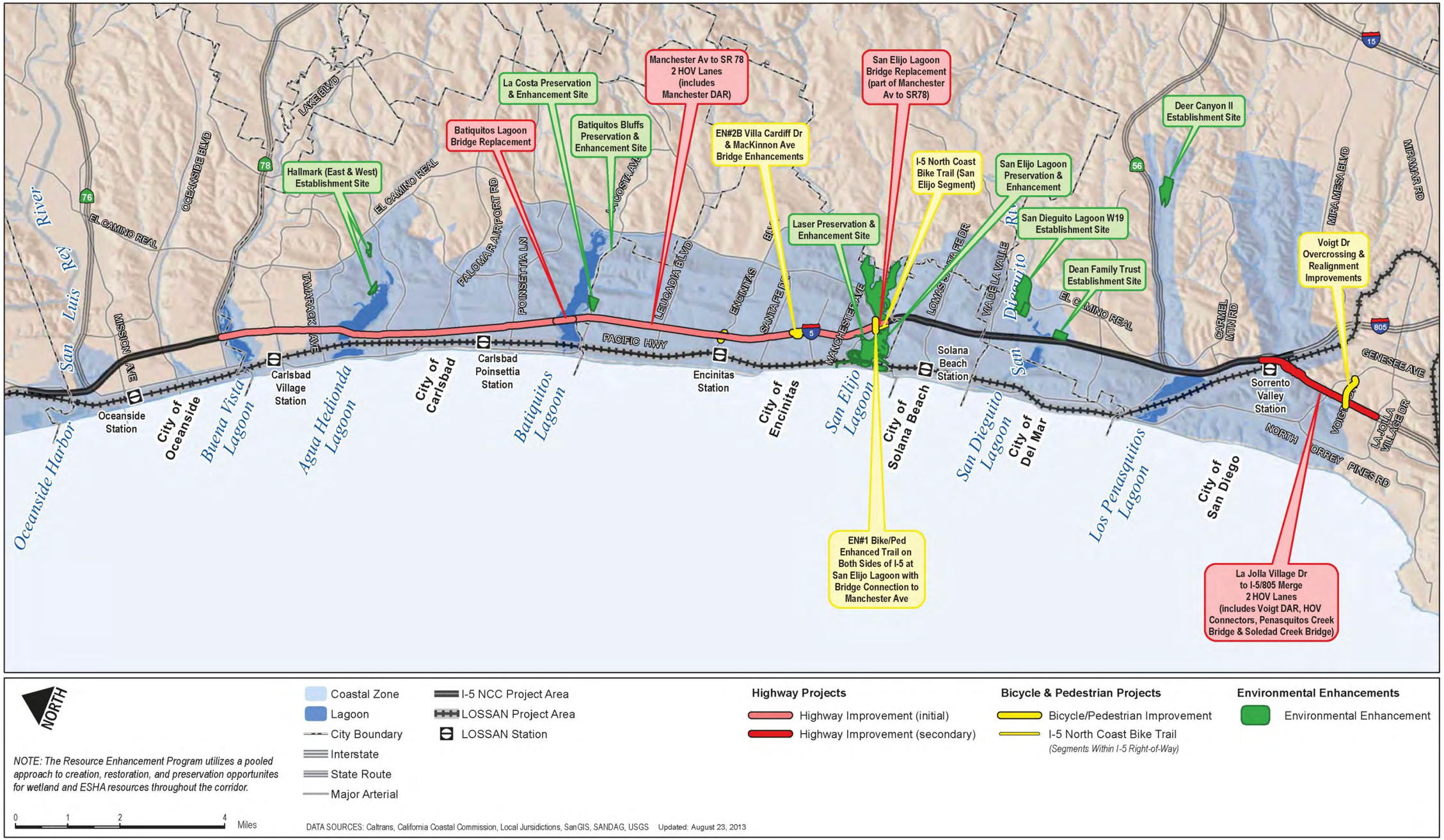


Figure 2-4.1a: Project Improvements and Enhancements: 2010-2020 Phase

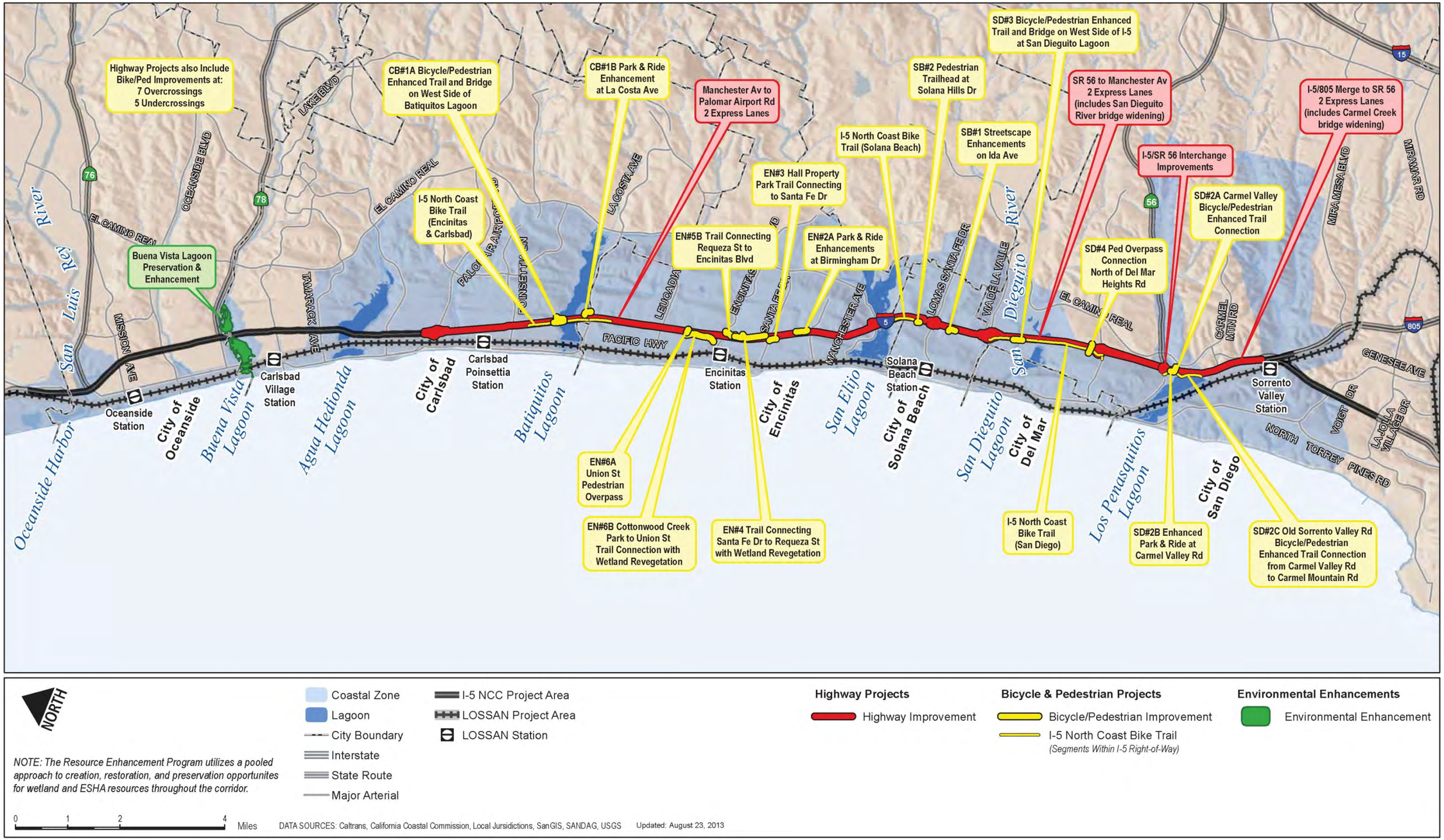


Figure 2-4.1b: Project Improvements and Enhancements: 2021-2030 Phase

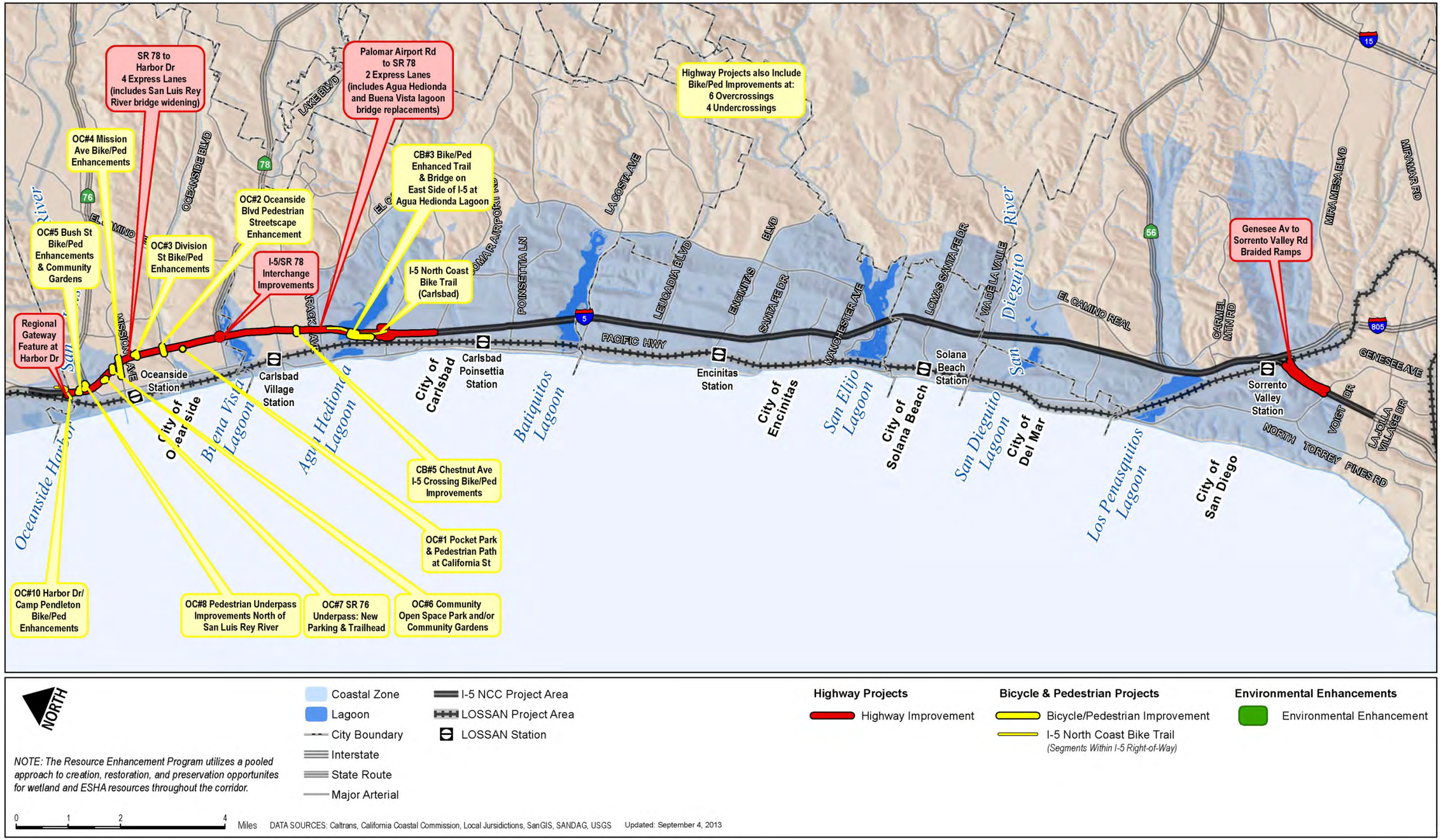


Figure 2-4.1c: Project Improvements and Enhancements: 2031-2035 Phase