I-5 MANAGED LANES PROJECT

(RED HILL AVE TO ORANGE / LOS ANGELES COUNTY LINE)

Counties of Orange and Los Angeles, California
Cities of Irvine, Tustin, Santa Ana, Orange, Anaheim, Fullerton, Buena Park, La Mirada, and Santa Fe Springs

12-Ora-5 – PM 28.9/44.4, 26.9, 27.9, 28.4
07-LA-5 – PM 0.1, 0.3, 0.6, 1.7
12-Ora-55 – PM 7.4, 8.0, 8.7, 8.9, 9.2, 9.7 9.9, 10.2
12-Ora-57 – PM 11.0, 11.3, 11.9, 12.5, 12.7, 12.9, 13.5
12-Ora-91 – PM 0.4, 0.7, 1.1, 1.3, 1.4, 1.6, 1.8, 2.0, 2.2, 2.6, 2.8, 3.4

EA 12-0Q950

VISUAL IMPACT ASSESSMENT

Prepared for

Caltrans

CALTRANS DISTRICT 12 ORANGE COUNTY

March 24, 2023

Visual Impact Assessment

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12-Ora-57 – PM 11.0, 11.3, 11.9, 12.5, 12.7, 12.9, 13.5
12-Ora-91 – PM 0.4, 0.7, 1.1, 1.3, 1.4, 1.6, 1.8, 2.0, 2.2, 2.6, 2.8, 3.4

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March 24, 2023

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Statement of Compliance: Produced in compliance with National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) requirements, as appropriate, to meet the level of analysis and documentation that has been determined necessary for this project.

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Alben Phung, Associate Environmental Planner, Environmental Planning, 1750 East 4th Street, Suite 100, Santa Ana, CA 92705; (657) 328-6054 (Voice), or use the California Relay Service TTY number, (800) 735-2929 (TTY to Voice), (800) 735-2922 (Voice to TTY) or 711.

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Acronyms and Abbreviations

Abbreviation	Definition
AVE	Area of Visual Effect
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
EL	Express Lane
FHWA	Federal Highway Administration
HOV	High-Occupancy Vehicle
I-	Interstate
KV	Key View
LRTP	Long Range Transportation Plan
NEPA	National Environmental Policy Act
OCTA	Orange County Transportation Authority
PA&ED	Project Approval and Environmental Document
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SCAG	Southern California Association of Governments
SR	State Route
VAU	Visual Assessment Units

1. PROJECT DESCRIPTION

The California Department of Transportation (Caltrans) District 12 is proposing managed lanes (ML) improvements in both directions on Interstate (I) 5. The improvements would modify the existing high-occupancy vehicle (HOV) lanes within the proposed Project limits to address operational deficiencies. The proposed Project limits on I-5 extend from Red Hill Avenue (Post Mile [PM] 28.9) to the Orange County/Los Angeles (OC/LA) County line (12-ORA-5 PM 44.4) in the cities of Irvine, Tustin, Santa Ana, Orange, Anaheim, Fullerton, Buena Park, La Mirada, and Santa Fe Springs and include implementing associated signage (including advance signage on adjacent arterials) and tolling infrastructure.

The purpose of this project is to improve the overall movement of people and goods along this section of I-5 by:

- Improving the ML network operations
- Improving mobility and trip reliability
- Maximizing person throughput by facilitating efficient movement of bus and rideshare users
- Applying technology to help manage traffic demand

The need, or deficiency, of the project is the existing I-5 HOV lanes between Red Hill Avenue and the OC/LA County line experience:

- HOV lane degradation (does not meet the federal performance standards)
- Demand exceeds existing capacity
- Operational deficiencies

Four preliminary alternatives, including three Build Alternatives and the No Build Alternative, are under consideration and are described below.

1.1 Alternative 1—No Build Alternative

Alternative 1, the No Build Alternative, does not include improvements to the existing lane configurations for I-5. Under the No Build Alternative, no additional roadway improvements would occur. This alternative includes other projects on the financially-constrained project list in the adopted Southern California Association of Governments (SCAG) 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) within the proposed Project limits on I-5 and the Preferred Plan in the Orange County Transportation Authority (OCTA) 2018 Long-Range Transportation Plan (LRTP) within the proposed Project limits.

1.2 Alternative 2—Build Alternative: Modify Existing HOV 2+ Lanes to HOV 3+ Lanes

Alternative 2 would maintain the existing lane configurations for I-5 with a modification of the minimum HOV-lane occupancy requirement from two-plus (2+) to three-plus (3+) passengers within the current HOV system in each direction, between Red Hill Avenue and the OC/LA County line. As a result of this increase in the occupancy requirement and improved trip reliability, through the Transportation System Management/Transportation Design Management (TSM/TDM) elements, it would promote and encourage public and private transit such as Bus Rapid Transit (BRT) and ridesharing. Under this alternative, no additional roadway improvements would occur. Additionally, two proposed park-and-ride facilities are being evaluated as part of Alternative 2 and would

be constructed within the existing freeway right-of-way. Sign replacement and pavement delineation would also be implemented to meet the latest California Manual on Uniform Traffic Control Devices (CA MUTCD) standards.

1.2.1 Ramps

Physical modifications of the ramp geometry will not be required where the current HOV system is converted from 2+ to 3+ passengers; however, replacement of signage at direct-access ramps will be required accordingly for Alternative 2.

1.2.2 Impact to Structures

Alternative 2 would not impact existing structures or create new structures (e.g., bridges) as part of its proposed design.

1.2.3 Drainage and Water Quality

Drainage management measures would be included in Alternative 2 to address the impacts to drainage patterns associated with new construction of the park-and-ride facilities. Proposed major drainage design features would include: maintaining existing drainage flow patterns and incorporating existing drainage systems to the maximum extent practicable; providing drainage facilities that would accommodate future improvements; and providing drainage facilities to prevent and/or reduce substantial erosion or siltation on or off site.

Some of the existing systems may be abandoned or removed to accommodate construction of Alternative 2. Best Management Practices (BMPs) would be included to address stormwater requirements and treatment of the added impervious area created by Alternative 2.

1.2.4 Tolled Components

Alternative 2 would not include the implementation of any new tolling components as part of the proposed design.

1.2.5 Transportation Management Plan

Alternative 2 may be implemented in phases and/or segments and procured under one or more contracts, including the option of using design/build. Construction-related delays are anticipated during construction of Alternative 2.

In accordance with Caltrans Deputy Directive (60-R2), a Transportation Management Plan (TMP) has been prepared for Alternative 2 which includes strategies that, when implemented, would minimize Project-related construction and circulation impacts.

It is anticipated that lane closures would be required, and it may be necessary to temporarily close on/off-ramps and connectors during construction of Alternative 2.

Some of the key elements recommended in the TMP include the following: Public Information/Public Awareness Campaign; Motorist Information Strategies; Incident Management; Construction Strategies; Demand Management; and Alternate Route Strategies.

Detailed detour plans, staging plans, and traffic handling plans would also be developed during the final design phase.

1.2.6 Construction Staging

As no additional construction would occur with Alternative 2, there would be no stage construction impacts associated with construction acitivites within the freeway mainline, which are limited to signage replacement and pavement delineators along the freeway mainline. Construction staging is anticipated for the development of the park-and-ride facilities to minimize impacts to existing traffic.

Stage construction concept plans are currently being developed. Should Alternative 2 be selected as the Preferred Alternative, detailed stage construction and detour plans would be developed during final design. Detailed stage construction plans and traffic handling plans would also be developed in the final design stage.

1.2.7 Right-of-Way Data

Additional right-of-way (e.g., full acquisition, partial acquisition, aerial easements, temporary construction easements) is not anticipated for the construction of Alternative 2.

1.2.8 Utility and Other Owner Involvement

Alternative 2 is not expected to have any impacts to surrounding utilities, as there are no proposed utility relocations associated with its proposed design.

1.2.9 Nonstandard Design Features (Design Standards Risk Assessment)

Alternative 2 would not impact existing nonstandard design features or create new nonstandard design features as part of the proposed design.

1.2.10 Sound Walls

Alternative 2 would not impact any existing sound walls as part of the proposed design.

1.2.11 Transportation System Management/Transportation Demand Management

Alternative 2 would not implement any new TSM/TDM measures or features beyond the ramp metering, changeable message signs (CMS), cameras, and traffic speed detection systems that already exist within the proposed Project limits.

1.2.12 Highway Planting

Existing planting and irrigation systems removed during construction of the Alternative 2 park-and-ride facilities would be replaced wherever space is available. Generally, existing vegetation in and around the park-and-ride areas would be replanted to the maximum extent practicable.

Should Alternative 2 be selected as the Preferred Alternative, planting design would be provided during the final design phase; would consider safety, maintainability, and aesthetic compatibility with adjacent urban communities; and would not deviate significantly from the existing planting theme.

1.2.13 Erosion Control

Alternative 2 would be required to comply with the terms and conditions in accordance with Attachment D of the NPDES Statewide Construction General Permit (SWRCB 2020), which includes a written site-specific Construction Site Monitoring Program (CSMP). The CSMP would include implementation of specific stormwater

effluent monitoring requirements to ensure that the implemented BMPs are effective in preventing discharges from exceeding any of the water quality standards.

Erosion control measures would be implemented during construction as well as after completion of Alternative 2 construction in accordance with the requirements of the Santa Ana (Region 8) and Los Angeles (Region 4) Regional Water Quality Control Boards (RWQCBs) and the current statewide National Pollutant Discharge Elimination System (NPDES) Construction General Permit. During construction, potential construction site best management practices (BMPs), such as temporary fiber rolls, temporary mulch, drainage inlet protection, concrete washout facilities, street sweeping, and hydroseeding, would be used to minimize erosion. All finished slopes would receive replacement planting or vegetative erosion control application.

Should Alternative 2 be selected as the Preferred Alternative, specific erosion control measures and construction site BMP design would be developed during final design. Preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) would be required during construction.

1.3 Alternative 3—Build Alternative: Convert Existing HOV Lanes to Express Lanes

Alternative 3 would convert the existing HOV lane to an Express Lane (EL) in each direction between Red Hill Avenue and State Route (SR) 55; convert two existing HOV lanes to ELs in each direction between SR-55 and SR-57; and convert the existing HOV lane to an EL in each direction from SR-57 to the OC/LA County line. The typical cross-section consists of a 12-foot-wide EL, a 2- to 4-foot buffer, 12-foot-wide general-purpose (GP) lanes, 12-foot-wide auxiliary lanes, a 4- to 26-foot-wide inside shoulder, and a 10-foot-wide outside shoulder and would be provided to accommodate the EL. One 12-foot weave lane is proposed at locations of ingress or egress. Additionally, two proposed park-and-ride facilities are being evaluated as part of Alternative 3 and would be constructed within the existing freeway right-of-way. Sign replacement and pavement delineation would also be implemented to meet the latest CA MUTCD standards.

1.3.1 Ramps

Alternative 3 would impact several existing ramps. The affected ramps and the proposed improvements are summarized in **Table 1** and **Table 2**, below. In general, several existing ramps would be shifted to accommodate outside widening by Alternative 3.

Table 1: Anticipated Impacts to On-Ramps within the Proposed Project Limits—Alternative 3

Location		Post Mile (Approx.)	Ramp Improvements
1	NB SR-55 to NB I-5 Direct Connector	30.472	X
2	Grand Ave. SB Direct-Access On-Ramp	31.794	X
3	N. Main St. SB On-Ramp	32.953	X
4	SB SR-57 to SB I-5 Direct Connector	34.222	X
5	Gene Autry Wy. SB Direct-Access On-Ramp	35.949	X
6	Gene Autry Wy. NB Direct-Access On-Ramp	35.949	X
7	EB SR-91 to SB I-5 Direct Connector	41.928	X

	Location	Post Mile (Approx.)	Ramp Improvements
8	WB SR-91 to NB I-5 Direct Connector	42.42	X
9	Auto Center Dr. NB On-Ramp	42.928	X
10	Artesia Blvd. SB On-Ramp	44.271	X
	Total Number of On-Ramp Improvements:		**10**

Notes: * Existing ramp metering to be relocated and/or upgraded to latest equipment requirements.
**Ramps metered separately before joining.
EB = eastbound
I = Interstate
NB = northbound
SB = southbound
SR = State Route
WB = westbound

Table 2: Anticipated Impacts to Off-Ramps within the Proposed Project Limits—Alternative 3

	Location	Post Mile (Approx.)	Ramp Improvements
1	Grand Ave. NB Direct-Access Off-Ramp	31.532	X
2	Penn Wy. SB Off-Ramp	32.521	X
3	NB I-5 to NB SR-57 Direct Connector	33.433	X
4	Gene Autry Wy. NB Direct-Access Off-Ramp	35.466	X
5	Gene Autry Wy. SB Direct-Access Off-Ramp	36.309	X
6	Anaheim Blvd. NB Direct-Access Off-Ramp	36.072	X
7	Disneyland Dr. SB Direct-Access Off-Ramp	38.439	X
8	NB I-5 to WB SR-91 Direct Connector	41.909	X
9	SB I-5 to EB SR-91 Direct Connector	42.545	X
10	Beach Blvd. SB Off-Ramp	43.680	X
11	Artesia Blvd. NB Off-Ramp	43.996	X
	Total Number of Off-Ramp Improvements:		**11**

EB = eastbound
I = Interstate
NB = northbound
SB = southbound
SR = State Route
WB = westbound

Alternative 3 is not anticipated to impact system interchanges within the proposed Project limits. Within the proposed Project limits, ramp metering is incorporated into the existing local interchange on-ramps, except at the South Anaheim Boulevard northbound on-ramp. Where ramp improvements affect ramp metering, any ramp metering equipment would be reestablished. Existing ramp meters and equipment would be reused where possible.

For the majority of locations, physical modifications of the ramp geometry will not be required where the HOV direct connector is converted to an ELs Connector; however, replacement of signage and addition of tolling equipment will be required accordingly. The incorporation of weave lanes required physical modifications of the ramp gore geometry where the HOV Direct Connector is converted to an ELs Connector at the northbound Gene Autry Way off-ramp, northbound Disney Way off-ramp, southbound Gene Autry Way off-ramp, and southbound Disneyland Drive off-ramp.

1.3.2 Impact to Structures

Alternative 3 would not create new structures (e.g., bridges) but would impact one existing retaining wall to accommodate widening the mainline to avoid right-of-way acquisition. The affected retaining wall structure and the proposed improvements are summarized in **Table 3**.

Table 3: Anticipated Retaining Wall Impacts within the Proposed Project Limits—Alternative 3

Location	Post Mile	Retaining Wall Improvements		Maximum Length of Extension (Feet)
		Rebuild I / New(N)	Type	
SB I-5, North of E. 17th St.	32.521	R*	Special	793

Notes: *Retaining Wall/Sound Wall.
I = Interstate
SB = Southbound

1.3.3 Drainage and Water Quality

Drainage management measures would be included in Alternative 3 to address the impacts to drainage patterns associated with new construction. Proposed major drainage design features would include: maintaining existing drainage flow patterns and incorporating existing drainage systems to the maximum extent practicable; providing drainage facilities that would accommodate future improvements; and providing drainage facilities to prevent and/or reduce substantial erosion or siltation on or off site.

Some of the existing systems may be abandoned or removed to accommodate the construction of Alternative 3. For widened sections of the pavement for Alternative 3, the existing edge drains would be replaced and reconnected to the drainage system; final connection and location details would be developed in the final design phase. BMPs would be included to address stormwater requirements and treatment of the added impervious area created by Alternative 3.

1.3.4 Tolled Components

TOLL OPERATIONS POLICIES

The ELs would require single-occupant vehicles to pay a toll. The objective is to open the tolled ELs with some level of HOV occupancy free to encourage rideshare and transit usage. Operational adjustments to the tolled ELs may be implemented based on demand, rates of speed, traffic volumes, and to meet financial covenants, maintenance, and operational obligations. This would be determined based on the Traffic and Revenue (T&R) analysis, input from public, and Caltrans business rules. Caltrans has the authority to set the occupancy policy on the I-5 ELs.

Key Caltrans business rules may include, but are not limited to:

- Toll-free travel for vehicles that meet minimum vehicle occupancy requirements, motorcycles, and buses.
- Qualifying carpools would continue to be able to access the lanes without a charge; trucks, other than two-axle light-duty trucks, would not be allowed.
- Toll/transit credits would be available to frequent ELs transit riders.
- Emergency vehicles may use the ELs toll-free when responding to incidents.
- Qualifying Clean Air Vehicles would be given a toll discount.
- Equity Assistance Plan.

TOLL OPERATIONS AND MAINTENANCE

At this time, a process is in place to develop a formal maintenance plan as part of the Caltrans and FHWA systems engineering process. It is anticipated that Caltrans would maintain the physical infrastructure, such as pavement, striping, and median barriers, as well as perform general maintenance, such as trash and graffiti removal, paid for from toll revenues. It is anticipated that Caltrans would also manage the tolling infrastructure, while the customer service centers and other back-office support facilities would be contracted to others. However, final agreements and decisions on such responsibilities will be decided in the future phases of the Project.

TOLL REVENUE/PRICING STRUCTURE

Time-of-day pricing and dynamic pricing methods are being analyzed for their application as part of the proposed Project. Toll rates would be set in response to vehicle demand and would be adjusted as necessary to regulate volume in the ELs to maintain traffic flow at a predetermined level of service (LOS).

The pricing structure and details would be evaluated further during final design. No tolling amount or pricing decisions have been made at this time.

TOLL COLLECTION

The I-5 ELs facility is expected to use an all-electronic toll collection system and would not accept cash or credit card payment on the facility. This would eliminate the need for customers to stop and pay tolls at traditional tollbooths. The electronic toll collection system would require customers to have pre-paid accounts with a tolling agency and mount a nonstop automated vehicle identification transponder or toll tag on the windshield of a registered vehicle. Tolls would be collected electronically by reading the transponder at highway speeds.

TOLL ENFORCEMENT

Toll enforcement is an essential element of any successful EL system, ensuring that traffic laws are enforced, customers are charged the appropriate toll based on vehicle occupancy, and toll evasion is minimized. Toll enforcement would be accomplished through California Highway Patrol (CHP) patrols, electronic systems, and facility design. The CHP is anticipated to be contracted to conduct routine and supplemental enforcement services on the I-5 Express Lanes facility, including toll infractions, HOV eligibility occupancy infractions, buffer crossing infractions, speeding, and other moving violations. The Electronic Toll Collection (ETC) system is intended to identify both vehicles that do not have a transponder as well as the declared transponder switch setting. Caltrans would incorporate an infrared occupancy detection system into the EL enforcement. The CHP currently provides enforcement on all of the toll roads in southern California under several different institutional arrangements.

1.3.5 Transportation Management Plan

The same TMP described under Alternative 2 would be utilized as part of Alternative 3. This infrastructure is detailed in Section 1.2.5, above.

1.3.6 Construction Staging

It is anticipated that Alternative 3 would be designed and constructed in separate phases to facilitate Project delivery based on available funding. Each phase would include construction staging to minimize impacts to existing traffic. The same number of existing mainline lanes would be kept open to traffic during construction whenever feasible.

Stage construction concept plans are currently being developed. However, Alternative 3 would require ramp closures of less than 10 days to accommodate reconstruction of pavement at or near on- and off-ramps. Closures of successive on- or off-ramps would be avoided. Should Alternative 3 be selected as the Preferred Alternative, detailed stage construction and detour plans would be developed during final design. Detailed stage construction plans and traffic handling plans would also be developed in the final design stage.

1.3.7 Right-of-Way Data

Additional right-of-way (e.g., full acquisition, partial acquisition, aerial easements, temporary construction easements) is not anticipated for the construction of Alternative 3.

1.3.8 Utility and Other Owner Involvement

Underground and above-ground utility conflicts are anticipated within the proposed Project limits. The anticipated utility impacts within the proposed Project limits are summarized in **Table 4.**

Should Alternative 3 be selected as the Preferred Alternative, a "positive location" verification would be performed during the final design phase, which would include surveying and boring the area in order to verify the depth and specific locations of underground utilities in the proposed Project vicinity that may be in close proximity to or conflict with proposed improvements as determined from as-built plans and utility company records. Relocation or addition of towers are not anticipated for the existing overhead electrical lines.

Table 4: Anticipated Retaining Wall Impacts within the Proposed Project Limits—Alternative 3

No.	Location	Utility Owner and/or Contact Name	Wet (W) / Dry (D)	Utility Type	Utility Conflict Description	H
1	N. Main St. SB On-Ramp	AT&T	D *	Telecom	Roadway Conflict	N/A
2	North of N. State College Blvd.	PacBell	D	Telecom	Overhead Sign Conflict	N/A
3	North of N. State College Blvd.	SCE	W	Electric	Overhead Sign Conflict	N/A

Notes: H* denotes high-priority utilities based on Chapter 600 of the Caltrans Encroachment Permits Manual.
AT&T = American Telephone and Telegraph Company
Caltrans = California Department of Transportation
N/A = Not Applicable
PacBell = Pacific Bell Telephone Company
SB = Southbound
SCE = Southern California Edison

1.3.9 Nonstandard Design Features (Design Standards Risk Assessment)

A listing of major existing nonstandard design features for Alternative 3 is included in **Table 5**, below.

Table 5: Design Standards Risk Assessment—Alternative 3

No.	Design Standard	Probability of Design Exception Approval (None, Low, Medium, High)
1	201.1 (Stopping Sight Distance Standards)*	Medium/High
2	301.1 (Lane Width)*	Medium
3	302.1 (Shoulder Width)*	Medium/High
4	305.1 (Median Width Freeways and Expressways-Urban)**	High
5	305.1(3)(a) (Median Width)*	High
6	309.1(3)(a) (Horizontal Clearances for Highways)*	Medium /High
7	504.7 (Minimum Weave Length)*	High

Notes: *Boldface
**Underline

1.3.10 Sound Walls

Alternative 3 would impact one existing sound wall. The affected sound wall and the proposed improvements are summarized in **Table 6.**

Table 6: Anticipated Sound Wall Impacts within the Proposed Project Limits—Alternative 3

Location	Post Mile	Sound Wall Improvements			Maximum Length of Extension (Feet)
		Rebuild (R) / New (N)	Extension	Removal	
SB I-5, North of E. 17th St.	32.521	R*			793

Notes: *Retaining Wall/Sound Wall.

I = Interstate

SB = Southbound

1.3.11 Transportation System Management/Transportation Demand Management

TSM/TDM aims to improve traffic flow, promote travel safety, and increase transit usage and rideshare participation. The TSM/TDM measures included as part of Alternative 3 would add TSM/TDM techniques to existing features within the proposed Project limits.

The following TSM features would be incorporated into Alternative 3's proposed design:

- Ramp metering
- Intelligent Transportation Systems
- CHP observation and enforcement areas

The following TDM measures have been incorporated into Alternative 3:

- The EL use would be incentivized for carpool, transit users, electric and clean-emissions vehicles (e.g., discounted fare, partial or full subsidized fare).
- Potential excess toll revenue would be allocated to fund projects and programs to reduce vehicle miles traveled (VMT), such as:
    - Outreach and education regarding ridesharing, transit travel, and multimodal opportunities;
    - Outreach and education regarding alternative work schedule programs and telecommuting; and
    - Construction of two park-and-ride facilities.
- Generating sustainable funding to support ongoing operations and promoting transit equity programs.
- Alternative 3 would facilitate travel for commercial buses and tourist buses to and from tourist destinations within the proposed Project area.

1.3.12 Highway Planting

The same erosion control features described under Alternative 2 would be included as part of Alternative 3. These are detailed in Section 1.2.12, above. Generally, existing vegetation in and around the interchange areas would be replanted; however, due to limited space between the freeway improvements and right-of-way, planting replacement would not always be possible along the mainline.

1.3.13 Erosion Control

The same erosion control features described under Alternative 2 would be included as part of Alternative 3. These are detailed in Section 1.2.13, above.

1.4 Alternative 4—Build Alternative: Convert Existing HOV Lanes to Express Lanes and Construct Additional Express Lanes

Alternative 4 would convert the existing HOV lane to an EL in each direction between Red Hill Avenue and SR-55; convert two existing HOV lanes to ELs in each direction between SR-55 and SR-57; convert the existing HOV lane to an EL in each direction from SR-57 to the OC/LA County line; and construct an additional EL in each direction between SR-57 and SR-91. The typical cross-section consists of 12-foot-wide ELs, a 2- to 4-foot buffer, 12-foot-wide GP lanes, 12-foot-wide auxiliary lanes, a 4- to 14-foot wide inside shoulder, and a 10-foot-wide outside shoulder and would be provided to accommodate the ELs. One 12-foot weave lane is proposed at locations of ingress or egress. Additionally, two proposed park-and-ride facilities are being evaluated as part of Alternative 4 and would be constructed within the existing freeway right-of-way. Sign replacement and pavement delineation would also be implemented to meet the latest CA MUTCD standards.

1.4.1 Ramps

Alternative 4 would impact some existing ramps within the proposed Project limits. The affected ramps and the proposed improvements are summarized in **Table 7** and **8**, below. In general, some existing ramps would be shifted to accommodate outside widening by Alternative 4. Alternative 4 is not anticipated to impact system interchanges within the proposed Project limits. Within the proposed Project limits, ramp metering is incorporated into the existing local interchange on-ramps, except at the South Anaheim Boulevard northbound on-ramp. Where ramp improvements affect ramp metering, any ramp metering equipment would be re-established. Existing ramp meters and equipment would be reused where possible.

For the majority of locations, physical modifications of the ramp geometry would not be required where the HOV Direct Connector is converted to an ELs Connector; however, replacement of signage and the addition of tolling equipment would be required accordingly. The incorporation of weave lanes would require physical modifications at the ramp gore where the HOV Direct Connector is converted to an ELs Connector at the following locations:

- Southbound SR-57 connector
- Northbound SR-57 connector
- Southbound Gene Autry Way on-ramp
- Northbound Gene Autry Way off-ramp
- Northbound Disney Way off-ramp
- Southbound Gene Autry Way off-ramp
- Northbound Gene Autry Way on-ramp
- Southbound Disneyland Drive off-ramp

Table 7: Anticipated Impacts to On-Ramps within the Proposed Project Limits—Alternative 4

Location		Post Mile (Approx.)	Ramp Improvements
1	NB SR-55 to NB I-5 Direct Connector	30.472	X
2	Grand Ave. SB Direct-Access On-Ramp	31.794	X
3	N. Main St. SB On-Ramp	32.953	X
4	SB SR-57 to SB I-5 Direct Connector	34.222	X
5	Gene Autry Wy. SB Direct-Access On-Ramp	35.949	X
6	Gene Autry Wy. NB Direct-Access On-Ramp	35.949	X
7	W. Lincoln Ave. NB On-Ramp	38.913	X
8	EB SR-91 to SB I-5 Direct Connector	41.928	X
9	WB SR-91 to NB I-5 Direct Connector	42.42	X
10	Auto Center Dr. NB On-Ramp	42.928	X
11	Artesia Blvd. SB On-Ramp	44.271	X
Total Number of Off-Ramp Improvements:			**11**

Notes: * Existing ramp metering to be relocated and/or upgraded to latest equipment requirements.

**Ramps metered separately before joining.
EB = Eastbound

I = Interstate

NB = Northbound

SB = Southbound

SR = State Route

WB = Westbound

Table 8: Anticipated Impacts to Off-Ramps within the Proposed Project Limits—Alternative 4

Location		Post Mile (Approx.)	Ramp Improvements
1	Grand Ave. NB Direct-Access Off-Ramp	31.532	X
2	Penn Wy. SB Off-Ramp	32.521	X
3	NB I-5 to NB SR-57 Direct Connector	33.433	X
4	Gene Autry Wy. NB Direct-Access Off-Ramp	35.466	X
5	Gene Autry Wy. SB Direct-Access Off-Ramp	36.309	X
6	Anaheim Blvd. NB Direct-Access Off-Ramp	36.072	X
7	Disneyland Dr. SB Direct-Access Off-Ramp	38.439	X
8	Lincoln Ave. SB Off-Ramp	39.471	X
9	N. Euclid St. NB Off-Ramp	39.263	X
10	NB I-5 to WB SR-91 Direct Connector	41.909	X
11	SB I-5 to EB SR-91 Direct Connector	42.545	X
12	Beach Blvd. SB Off-Ramp	43.680	X
13	Artesia Blvd. NB Off-Ramp	43.996	X
Total Number of Off-Ramp Improvements:			**13**

EB = Eastbound
I = Interstate
NB = Northbound
SB = Southbound
SR = State Route

1.4.2 Impact to Structures

Alternative 4 would not create new structures (e.g., bridges) but would impact existing retaining walls and create a new retaining wall. Retaining walls would be provided, where required, to minimize and avoid right-of-way acquisition. The affected retaining wall structures and the proposed improvements are summarized in **Table 9**.

Table 9: Anticipated Retaining Wall Impacts within the Proposed Project Limits—Alternative 4

Location	Post Mile	Retaining Wall Improvements		Maximum Length of Extension (Feet)
		Rebuild (R) / New(N)	Type	
SB I-5, South of E. 17th St.	32.521	R*	Special	793
Along NB I-5 to NB SR-57 Direct Connector	34.117	R	Special	479
Along SB SR-57 to SB I-5 Direct Connector	34.124	R	Special	446

Notes: *Retaining Wall/Sound Wall.

I = Interstate SB = Southbound

NB = Northbound SR = State Route

1.4.3 Drainage and Water Quality

The same drainage and water quality features described under Alternative 3 would be constructed as part of Alternative 4. These features are detailed in Section 1.3.3, above.

1.4.4 Tolled Components

The same tolling infrastructure described under Alternative 3 would be constructed as part of Alternative 4. This infrastructure is detailed in Section 1.3.4, above.

1.4.5 Transportation Management Plan

The same TMP described under Alternative 2 would be utilized as part of Alternative 4. This infrastructure is detailed in Section 1.3.5, above.

1.4.6 Construction Staging

Stage construction concept plans are currently being developed. However, Alternative 4 would require several 55-hour weekend closures of the SR-57 HOV Connectors to accommodate construction of retaining walls, the median barrier, and concrete pavement. Should Alternative 4 be selected as the Preferred Alternative, detailed stage construction and detour plans would be developed during final design. Detailed stage construction plans and traffic handling plans would also be developed in the final design stage.

1.4.7 Right-of-Way Data

Additional right-of-way (e.g., full acquisition, partial acquisition, aerial easements, temporary construction easements) is not anticipated for the construction of Alternative 4.

1.4.8 Utility and Other Owner Involvement

Underground and above-ground utility conflicts are anticipated within the proposed Project limits. The anticipated utility impacts within the proposed Project limits are summarized in **Table 10**.

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Table 10: Anticipated Impacts to Utilities within the Proposed Project Limits—Alternative 4

No.	Location	Utility Owner and/or Contact Name	Wet (W) / Dry (D)	Utility Type(s)	Utility Conflict Description	H*
1	N. Main St. SB On-Ramp	AT&T	D	Telecom	Roadway Conflict	N/A
2	North of N. State College Blvd.	Pacbell	D	Telecom	Overhead Sign Conflict	N/A
3	North of N State College Blvd.	SCE	W	Electric	Overhead Sign Conflict	N/A
4	N. Euclid St. NB Off-Ramp	City of Anaheim	W	Water	Roadway Conflict	N/A
5	N. Euclid St. SB	City of Anaheim	W	Water	Roadway Conflict	N/A
6	N. Euclid St. SB	Sprint	D	Telecom	Roadway Conflict	N/A
7	North of N. Euclid St. SB	Sprint	D	Telecom	Roadway Conflict	N/A

Notes: H* denotes high-priority utilities based on Chapter 600 of the Caltrans Encroachment Permits Manual.
AT&T = American Telephone and Telegraph Company
Caltrans = California Department of Transportation
N/A = Not Applicable
NB = Northbound
PacBell = Pacific Bell Telephone Company
SB = Southbound
SCE = Southern California Edison

Positive location would be performed for underground utilities in the proposed Project vicinity that may be in close proximity to or conflict with proposed improvements as determined from as-built plans and utility company records.

Relocation or addition of towers are not anticipated for the existing overhead electrical lines.

1.4.9 Nonstandard Design Features (Design Standards Risk Assessment)

A listing of major existing nonstandard design features for Alternative 4 is included in **Table 11**, below.

Table 11: Design Standards Risk Assessment—Alternative 4

No.	Design Standard	Probability of Design Exception Approval (None, Low, Medium, High)
1	201.1 (Stopping Sight Distance Standards)*	Medium/High
2	201.7 (Decision Sight Distance)**	High
3	301.1 (Lane Width)*	Medium
4	302.1 (Shoulder Width)*	Medium/High
5	305.1 (Median Width Freeways and Expressways-Urban)**	High
6	305.1(3)(a) (Median Width)*	High
7	309.1(3)(a) (Horizontal Clearances for Highways)*	Medium/High
8	504.2(2) (Design of Freeways Entrances and Exits)**	Medium

9	504.7 (Minimum Weave Length)*	High

Notes: *Boldface

**Underline

1.4.10 Sound Walls

The same impacts to sound walls described under Alternative 3 would occur as part of Alternative 4. These are detailed in Section 1.3.10, above.

1.4.11 Transportation System Management/Transportation Demand Management

The same TSM/TDM measures described under Alternative 3 would also be included as part of Alternative 4. These are detailed in Section 1.3.11, above.

1.4.12 Highway Planting

The same highway planting impacts described under Alternative 3 would occur as part of Alternative 4. These are detailed in Section 1.3.12, above.

1.4.13 Erosion Control

The same erosion control impacts described under Alternative 2 would occur as part of Alternative 4. These are detailed in Section 1.2.13, above.

2. PROJECT LOCATION AND SETTING

The project location and setting provide the context for determining the type of changes to the existing visual environment. The California Department of Transportation (Caltrans) District 12 proposes modifications to both directions of I-5, in the cities of Tustin, Santa Ana, Orange, Anaheim, Fullerton, Buena Park, and La Mirada. The project corridor or area of visual effect (AVE) is defined as the area of land that is visible from, adjacent to, and outside the I-5 rights-of-way, and is determined by topography, vegetation, and viewing distance. For purposes of this study, the AVE was determined to be 0.5 mile from the I-5 centerline, as most areas surrounding I-5 are relatively flat and views of I-5 are generally blocked or obscured by existing vegetation and land cover (buildings, fences, signs, walls, etc.).

Land use within the AVE primarily consists of large relatively flat urban areas characterized by residential, commercial/retail, parks and open space, and industrial uses. Human-made elements such as concrete, asphalt, glass, steel, plastic, and others are ubiquitous. Straight lines, bright colors, electric lighting, and moving vehicles dominate visual environments within the AVE.

The Santa Ana Mountains, Chino Hills, and Puente Hills are located north and east of I-5. They are blocked from view throughout most portions of the proposed Project by existing land cover (noise barriers, buildings, fences, signage, etc.) and existing vegetation, but they are visible to the north and east from some locations; however, they are not visually prominent.

Trees and vegetation located along the I-5 rights-of-way and ornamental vegetation located in adjacent areas outside of the I-5 rights-of-way comprise most of the natural visual elements. Several rivers and creeks cross the AVE including Coyote Creek, Santiago Creek, Santa Ana River, and several smaller creeks; however, these waterways are generally confined by concrete and are not in natural courses. They would be viewed within the surrounding urban visual context.

According to the California State Scenic Highway System Map, there are no officially designated State Scenic Highways within the project vicinity.

2.1 Visual Assessment Units

The project corridor was divided into a series of "outdoor rooms" or Visual Assessment Units (VAUs) with similar visual characteristics and qualities. For the proposed Project, the following four VAUs and their associated key views have been identified (**Figure 1**):

2.1.1 Tustin

This VAU consists of areas of the AVE between Red Hill Avenue in Tustin and the SR 55 interchange. The VAU is characterized by the urban/suburban areas of the AVE within Tustin City limits. Development includes small and large box retail, commercial, single- and multi-family residential, religious, schools, parks, and other urban land uses. The visual character is generally defined by one- to three-story buildings, ornamental landscapes, and surface parking lots. Visual elements also include fencing, electrical and non-electrical signage, lighting, utilities, and other associated human-made visual elements.

The existing I-5 corridor in this VAU is characterized by six to seven lanes of traffic in both directions, on and off ramps, and overpasses, and includes an interchange with SR 55. An existing HOV 2+ lane extends the length of the VAU in both directions. The VAU is generally bounded by noise barriers on both sides

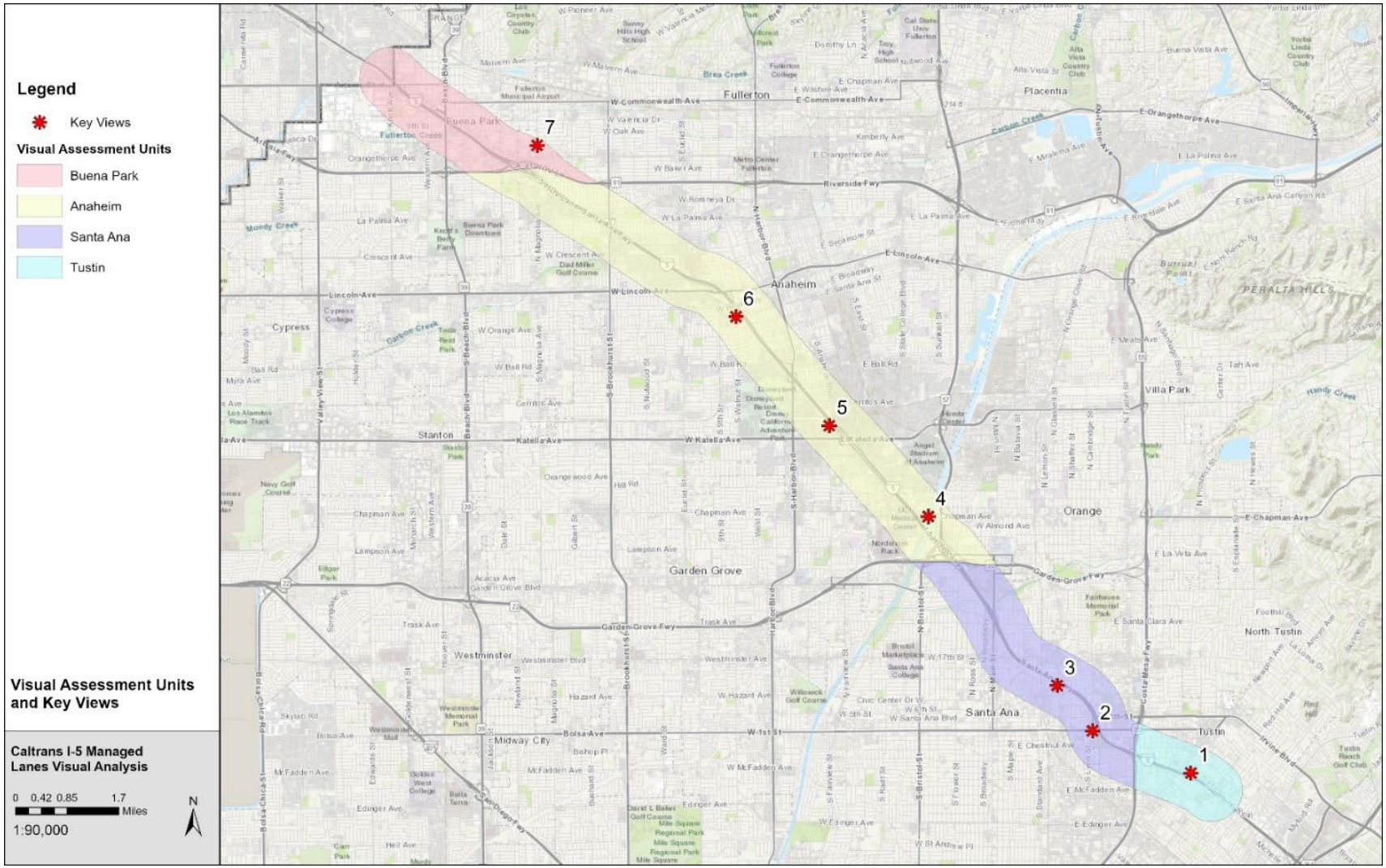
but there are limited areas where views are not obstructed by noise barriers. The grade of I-5 is generally above surrounding areas with underpasses at Red Hill Avenue and Newport Avenue.

The VAU includes noise barriers, on and off-ramps, sign structures, concrete dividers, and other human-made elements. The northern boundary of the VAU includes the I-5/SR 55 interchange. It is characterized by ramps, elevated lanes, under and overpasses, stormwater features, and other features associated with a major interchange.

2.1.2 Santa Ana

This VAU is characterized by the urban/suburban areas of the AVE between the SR 55 interchange and the SR 22/57 interchange. Development includes small and large box retail, commercial, single and multi-family residential, industrial, religious, and other urban land uses. The visual character is generally defined by one- to three-story buildings but does include several high-rise buildings, ornamental landscapes, and surface parking lots. This VAU also includes schools, parks, the Santiago Creek Trail and Park, and the Santa Ana Zoo which provide some natural visual elements associated with ornamental vegetation and open space. Visual elements also include fencing, electrical and non-electrical signage, lighting, utilities, and other associated human-made visual elements.

Figure 1. Visual Assessment Units and Key Views



The existing I-5 corridor in this VAU is characterized by six to seven lanes of traffic in both directions, on- and off-ramps, retaining walls, under and overpasses (including a railroad overpass), elevated lane structures, and noise barriers on both sides. Two HOV2+ lanes exist in both directions the length of the VAU. The grade of I-5 is both above and below surrounding areas depending on location and can limit or extend views to and from the freeway There are limited areas where views are not obstructed by noise barriers. Concrete, asphalt, metal, and other human-made elements, and bright colors are ubiquitous.

The VAU includes noise barriers, on and off ramps, sign structures, concrete dividers, and other human-made elements. There are numerous interchanges, underpasses, and overpasses, including a railroad overpass structure at Lincoln Avenue. The VAU is bounded on the south by SR 55 and the north by the I-5/SR 22 and I-5/SR 57 interchanges. These interchanges are characterized by ramps, elevated lanes, under and overpasses, stormwater features, and other features associated with major interchanges.

2.1.3 Anaheim

Portions of the Anaheim VAU lie within the Cities of Orange and Garden Grove, but most of the VAU lies within the City of Anaheim. Much of the I-5 corridor in this VAU is obscured by existing land cover and vegetation from surrounding areas but project elements may be visible from some locations. Adjacent land uses are generally defined by one- to three-story residential, retail, and commercial buildings. There are also larger retail areas characterized by larger buildings and developments such as the Main Place Mall and The Outlets at Orange. Commercial uses also include several high-rise buildings such as the City Tower, Orange Center Tower, and others. Institutional land uses within the VAU are characterized by large campuses and buildings such as the UCI Medical Center, Lamoreaux Justice Center, and Orange County Administration Buildings. Industrial land uses are characterized by large-scale buildings and warehouses.

The Anaheim VAU includes Disneyland adjacent to I-5 along with numerous associated commercial and retail developments, large buildings (hotels), and expansive paved parking lots and/or structures. Additionally, the Anaheim Convention Center and Angel Stadium of Anaheim are located just outside of the VAU but include large parking areas within 0.5-mile of the AVE boundaries. The I-5 corridor is obscured by existing land cover and vegetation for most viewers; however, some viewers from elevated positions (e.g., adjacent hotels) may have views of the freeway.

The VAU also includes parks, schools, and ornamental landscapes that provide some natural visual elements associated with ornamental vegetation and open space. The Santiago Creek Trail and Park and the Santa Ana River provide some natural visual elements such as trees, water, and open space; however, these water courses are not in a natural condition with concrete beds and banks.

The existing I-5 corridor in this VAU is characterized by six to seven lanes of traffic in both directions, on- and off-ramps, retaining walls, under and overpasses (including a railroad overpass), rail lines, elevated lane structures, and noise barriers. An HOV 2+ lane extends the length of the VAU in both directions. The grade of I-5 is both above and below surrounding areas depending on location and can limit or extend views to and from the freeway. There are limited areas where views are not obstructed by noise barriers. Concrete, asphalt, metal, other human-made elements, and bright colors are ubiquitous.

The VAU includes noise barriers, on-and off-ramps, sign structures, concrete dividers, and other human-made elements. There is a river crossing structure and numerous interchange, underpass, and overpass structures. It includes a rail corridor south of I-5 and a rail crossing at W Santa Ana Street. The VAU is

bounded on the south by the I-5/SR 22 and I-5/SR 57 interchanges and on the north by the I-5/SR 91 interchange. These interchanges are characterized by ramps, elevated lanes, under and overpasses, stormwater features, and other features associated with major interchanges.

2.1.4 Buena Park

This VAU encompasses the I-5 between SR 91 and the Orange County line. It is characterized by the urban/suburban areas of the AVE within Buena Park and Fullerton City limits. Adjacent development includes single- and multi-family residential, small and large box retail, commercial, industrial, religious, and other urban land uses. The visual character is generally defined by one- to three-story buildings but does include several high-rise buildings primarily associated with the Source OC commercial and retail development. The VAU also includes parks, schools, and ornamental landscapes that provide some natural visual elements associated with ornamental vegetation and open space.

The existing I-5 corridor in this VAU is characterized by six to seven lanes of traffic in both directions, on- and off-ramps, retaining walls, a major interchange at the SR 91 under and overpasses, a railroad track south of I-5, elevated lane structures, and noise barriers. An HOV 2+ lane extends in both directions along the VAU. Visual elements also include fencing, electrical and non-electrical signage, lighting, utilities, and other associated human-made visual elements. The grade of I-5 is both above and below surrounding areas depending on location and can limit or extend views to and from the roadway There are limited areas where views are not obstructed by noise barriers. Concrete, asphalt, metal, other human-made elements, and bright colors are ubiquitous.

The VAU includes noise barriers, on- and off-ramps, sign structures, concrete dividers, and other human-made elements. There is a river crossing structure and several interchange, underpass, and overpass structures. It includes a rail corridor south of I-5. The VAU is bounded on the south by the I-5/SR 91 interchange and on the north by the Los Angeles/Orange County line. The I-5/SR 91 interchange is characterized by ramps, elevated lanes, under and overpasses, stormwater features, and other features associated with a major interchange.

3. VISUAL RESOURCES AND RESOURCE CHANGE

Visual resources of the project setting are defined and identified below by assessing *visual character* and *visual quality* in the project corridor. *Resource change* is assessed by evaluating the visual character and the visual quality of the visual resources that comprise the project corridor before and after construction of the proposed Project.

Key views (KVs) representing each VAU were selected to represent visual character and quality in the project corridor (see **Figure 2**). KVs represent views that people either using the highway (highway users) or seeing the highway (highway neighbors) would have of the project corridor. The following section describes the existing visual environment as seen from each KV and the overall visual change that would occur as a result of the proposed Project.

3.1 Tustin Visual Assessment Unit

Figure 2. KEY VIEW (KV) #1 – From Tustin High School (Orange Street) looking southwest. The existing I-5 noise barrier is visible in the foreground (shaded).

Source: (Google, 2022)

Existing Conditions: The existing highway corridor is obscured by concrete retaining walls and noise barriers characterized by vertical walls, concrete, and concrete masonry unit block. Straight horizontal, vertical, and sloping planes and lines are common. Natural visual elements are characterized by trees and ornamental vegetation. Utilities and infrastructure, signage, advertising, power lines, overpasses, stormwater features, etc. are prevalent throughout the Tustin VAU, as is lighting from vehicles, streetlights, adjacent site lighting, and electric advertising.

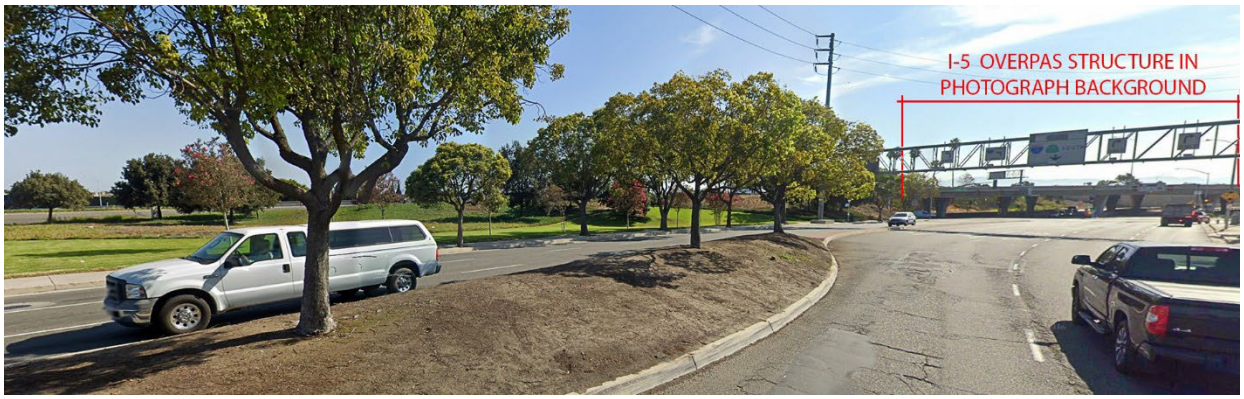
3.2 Santa Ana Visual Assessment Unit

Figure 3. KEY VIEW (KV) #2 – From the Santa Ana Zoo and East 1st Street looking east. The existing I-5 elevated lanes are visible in the foreground. (The existing main I-5 lanes are below grade and not visible.)

Source: (Google, 2022)

Existing Conditions: The existing I-5 mainline is located below the surrounding grade (passing below East 1st Street), but the HOV lane is elevated above street level at this location. The visual environment is characterized by concrete structures, guard rails, retaining walls, noise barriers, signage, and lighting. Natural elements are primarily comprised of ornamental trees visible outside of the highway corridor associated with the Santa Ana Zoo and vines on noise barriers. These elements would be considered natural visual elements but are not dominant within the VAU.

Figure 4. KEY VIEW (KV) #3 – Grand Avenue/Santa Ana Boulevard. This view is from the existing on-ramp from Santa Ana Boulevard looking northeast. The slope to the existing I-5 mainline lanes, the Santa Ana Boulevard and Grand Avenue overpass structures, and the southbound freeway entrance signage are visible (but shaded) in the photograph beyond the sign.



Source: (Google, 2022)

Existing Conditions: The existing I-5 mainline elevates from ground level (left side of **Figure 4**) up to the elevation of the overpass grade (right side of **Figure 4**). The overpass structures span nearly 700 feet with ramps, retaining walls, and other structures extending beyond. The interchange infield acts as a

stormwater catchment area that is vegetated with lawn, ground cover, and mature trees. This vegetation provides natural visual elements to an environment that is characterized by overpass structures, large signage, concrete and asphalt pavement, overhead utilities, and lighting. Trees also block or obscure direct views of overpass structures, retaining walls, signage, and other human-made elements.

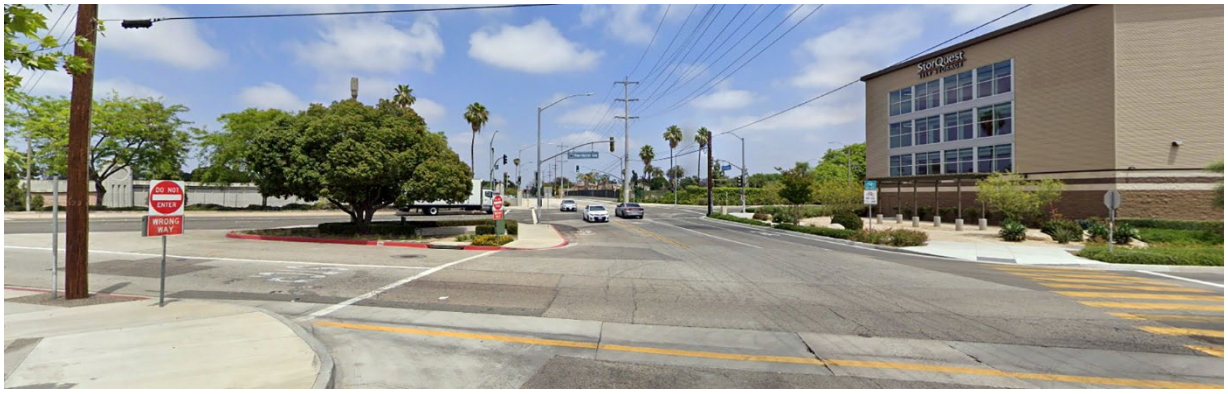
3.3 Anaheim Visual Assessment Unit

Figure 5. KEY VIEW (KV) #4 – From the existing West Chapman Avenue bridge looking south toward the I-5 bridge over the Santa Ana River. (The Santa Ana River Trail is visible to the left and right of the photograph.)

Source: (Google, 2022)

Existing Conditions: The existing I-5 bridge over the Santa Ana River is visible from this viewpoint and is characterized by a concrete structure and metal guardrails. The Santa Ana River is prominent from this location however, it is characterized by a wide and relatively flat bed. Banks are consistently graded riprap slopes with no vegetation. It is not in a natural condition and provides few natural visual elements. Lights and sources of glare are common generally in the highway corridor as well as areas outside of the river course.

Figure 6. KEY VIEW (KV) #5 – Looking east on West Santa Ana Street between Betsy Ross Elementary School and Betsy Ross Park.



Source: (Google, 2022)

Existing Conditions: The Santa Ana Steet overpass is visible (at ground level) in the background of the photograph beyond the S Manchester intersection. There is no access to I-5 at this location. The I-5 mainline is located below and is not visible for most viewers. Slopes down to the I-5 mainline lanes are characterized by ground cover and small trees but are generally not visible from surrounding areas. Natural visual elements are common, especially elements associated with Betsy Ross Park located directly behind the viewpoint location and north of Santa Ana Street. The overpass structure is characterized by concrete and metal fence/railings. A rail bridge is also visible from this location (concrete structures in the left of the photograph). Sound walls are also located along S Manchester Avenue. Overhead utilities are abundant in this location.

Figure 7. KEY VIEW (KV) #6 – Disney Way/South Anaheim Boulevard. This view is from Disney Way looking north. The slopes to the I-5 mainline, landscaped interchange infields, interchange overpass structures, and large-scale freeway entrance signs are visible in the foreground.

Source: (Google, 2022)

Existing Conditions: The existing I-5 mainline elevates to the overpass grade, with extensive overpass, retaining wall, and ramp structures visible. The interchange infield and slope are vegetated with deciduous and evergreen trees, ornamental palms, and ground cover and provide natural visual elements to an environment that is characterized by the overpass structures, large signage, concrete

and asphalt pavement, overhead utilities, and lighting. Large-scale commercial/retail buildings (i.e., hotels) dominate views to the south and west but also include ornamental landscapes.

3.4 Buena Park Visual Assessment Unit

Figure 8. KEY VIEW (KV) #7 – Looking south on South Magnolia Avenue toward the I-5/SR 91 interchange. The SR 91 ramps are slightly visible in the distance.

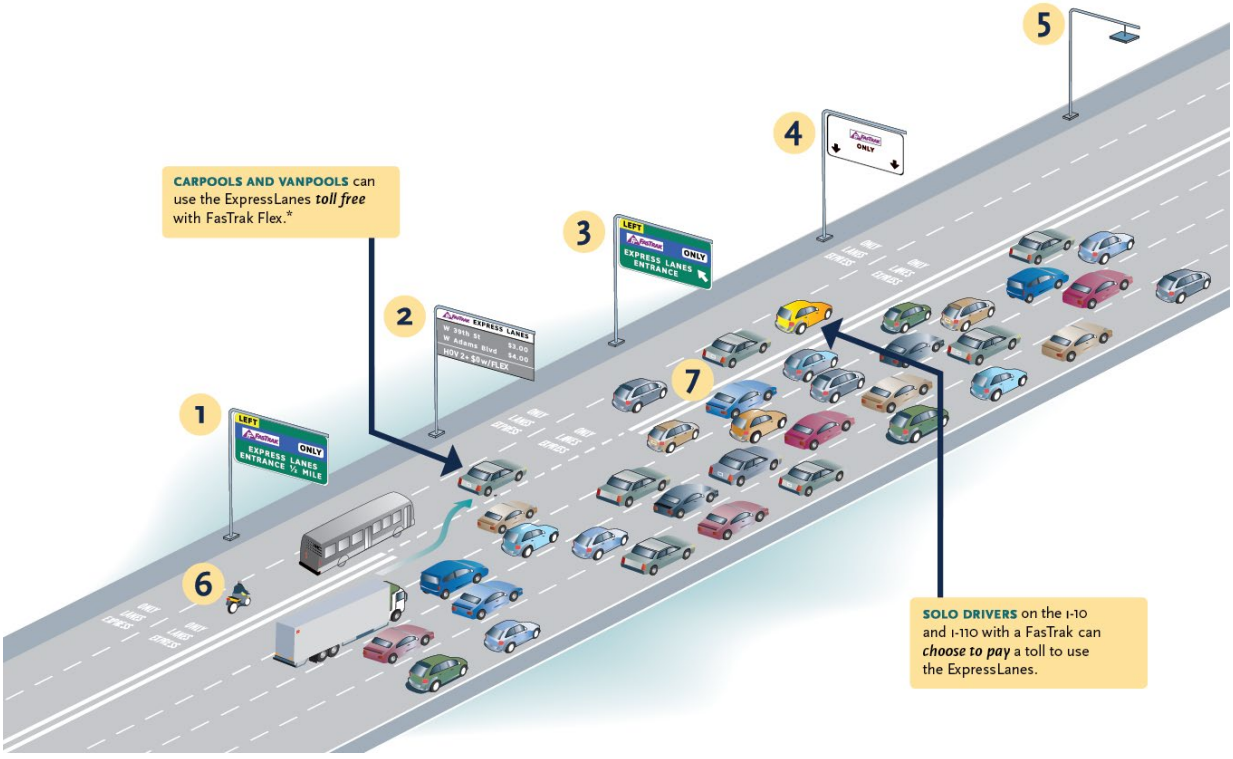
Source: (Google, 2022)

Existing Conditions: The existing I-5 mainline is located below the surrounding grade at this location; however, the I-5/SR 91 interchange ramps are slightly visible in the photograph background from this location but are not visually prominent. The visual environment is characterized by concrete structures, guard rails, retaining walls, noise barriers, signage, overhead utilities, and lighting. Natural elements such as ornamental trees are associated with the adjacent Buena Park Highschool landscape and roadside vegetation.

4. RESOURCE CHANGE

The overall Resource Change as measured by changes in visual character and visual quality would be low. The visual character of the proposed Project would be compatible with the existing visual character of the corridor. Visual changes associated with Alternatives 2 and 3 would primarily include pavement, lane markings, lane separators, signage, and other elements in the freeway corridor within existing paved areas (**Figure 9**, **Figure 10**). The form, line, color, texture, and continuity of proposed materials and visual elements are present and dominant in the existing visual context of I-5. In addition to these elements, visual changes associated with Alternative 4 would include some lane expansion, retaining walls, and park-and-ride facilities. Because it represents the most visual change and highest impacts, the remainder of this analysis will primarily focus on Alternative 4.

Figure 9. Express Lane Visual Elements



1. Express Lanes sign approximately 1/2 mile away from the entrance to signify the distance remaining to enter the Express Lanes. Entry to and exit from the Express Lanes are indicated by a single dashed white line.
2. Electronic sign displays two toll amounts:
   1) current toll from entrance point to the next major exit; and
   2) current toll from entrance point to the end of the Express Lanes.
3. Express Lanes entry point and information sign.
4. Express Lanes toll segment sign.
5. FasTrak Flex transponder and overhead antenna.
6. Motorcycles do not need a FasTrak account or transponder to use the Express Lanes.

7. The Express Lanes operate 24/7 and are separated from the general-purpose lanes by double solid white lines. (FasTrak, 2022)

Figure 10. Typical Signage

Representative lane layout, signage, and construction elements: (Cabanatuan, 2022)

Representative FasTrak Toll Sign: (Metropolitan Transportation Commission, 2022; Cabanatuan, 2022)

Representative lane configuration: (US Department of Transportation Federal Highway Administration, 2022)

The form, line, color, texture, and continuity of proposed materials and visual elements, such as pavement, lane markings, lane separators, signage, and others are present and dominant in the existing visual context of I-5.

The visual quality of the existing corridor consists of multiple lanes in each direction, HOV lanes, noise barriers, extensive signage, under and overpass structures, elevated lanes, and pavement. The reconfiguration or addition of similar elements would not significantly alter the existing visual environment. The scale and visual dominance of the roadway would slightly increase in Alternative 4 but would form an intact and unified visual character and no visual impacts to scenic areas would be expected. While new roadway lanes could potentially increase the total number of vehicles at a given time, the additional lanes may decrease congestion and the duration of exposure to those visual elements. These elements would include light and glare sources in night and low-light conditions, but the overall proposed light and glare conditions would be consistent and compatible with existing conditions.

Additional HOV lanes, lane delineation, shoulder, and pavement expansion would comprise the majority of visual impacts. Pavement expansion may necessitate the regrading of slopes to or from new pavement and the edge of the right of way. Slightly changing the degree of slope would generally not adversely impact the visual environment; however, vegetation may need to be removed to achieve the required grade. Removal of grasses, ground cover, and smaller shrubs would constitute temporary impacts as new plantings associated with mitigation measures could replace these natural visual elements within a short period of time (weeks to months); however, removal of existing large shrubs and trees would take much longer (years to decades) for replacements to provide the same beneficial visual elements.

Small areas of retaining walls and noise barriers would be expanded in several locations but would generally replace existing retaining walls. These changes may move impacts closer to viewers but would not substantially alter the visual quality of the existing visual environment. Two park-and-ride facilities would be included near Bus Rapid Transit stations outside of lane improvements but within the existing Caltrans right-of-way. Each would have miscellaneous features including entrance monuments, bike racks or bike lockers, benches and trash cans, solar panel and Electric Vehicle chargers, and security lighting. The detailed design of these facilities would be completed during the final design phase of the proposed Project but each would also include landscaping; however, most of the existing vegetation within the park and ride layout, including mature trees and palms, would be removed. Existing vegetation would be replaced with human-made elements but would be viewed within the existing visual context which includes freeway (I-5), ramps, retaining walls, signage, fencing, and other existing elements.

In addition, advanced signage would be provided on surface streets leading to proposed Express Lane entrances. New signs within the existing surface road corridors would add new visual elements; however, existing signage, human-made elements, bright colors, and reflective surfaces are abundant in the existing visual context. Visual impacts associated with the advanced signage would likely not cause significant adverse changes in the existing visual environment.

Figure 11. Advance Signage

Source: (The Orange County Register, 2022)

The overall visual intactness of the proposed Project would have a strong unity with the existing visual environment and would likely not be particularly vivid or memorable.

5. VIEWERS AND VIEWER RESPONSE

The population affected by the proposed Project is composed of viewers whose views of the landscape may be altered—either because the landscape itself has changed or their perception of the landscape has changed. Viewer response to changes in the visual environment can increase the perceived change in visual resources beyond the physical change caused by construction and operation of a proposed Project. Viewers have distinct and predictable visual concerns based on *exposure* and *sensitivity* that help to predict response to visual change. Viewer exposure has three attributes; viewer position (location) in relation to an object with proximity (closer) equating to more exposure, number of people seeing an object (quantity), and frequency (duration) in which an object is seen with greater duration being more exposure. Viewer sensitivity has three attributes; activity (are viewers preoccupied or engaged in observing their surroundings), awareness (is viewer focus wide and general or narrow and specific), and local values (what value do viewers place on a particular object).

There are two major types of viewer groups for highway projects: highway neighbors (people with views *to* the road) and highway users (people with views *from* the road). Highway neighbors would be exposed to few detrimental visual impacts as views of project elements would be screened for most highway neighbors by existing noise barriers, topography, vegetation, and/or land cover. A small number of highway neighbors who are directly adjacent to I-5 (close proximity), such as from upper levels of the UCI Medical Center (viewer position) or other high-rise buildings, may be exposed to long-duration views of project elements; however, the number, frequency, duration, and quantity of exposed viewers would not change from the existing I-5 viewers. Additionally, their activity and awareness are generally not focused on the freeway corridor or changes in existing visual conditions. The number of sensitive viewers would be low compared to the larger quantity of non-exposed viewers; therefore, the overall average response for this group is expected to be low.

Highway users would consist of drivers and passengers in vehicles traveling along I-5 and on arterials connecting to I-5. Large numbers of traveling viewers would be in close proximity to project elements but would have short-duration views as they travel along the freeway or arterials. Drivers would be focused on driving activities and awareness of, and sensitivity to, proposed changes would likely be low. Passengers would likely focus on elements outside of the highway corridor (e.g., trees, vegetation, distant mountains, human-made landcover, etc.) and would be less focused on project elements. Traveling viewers would generally have less sensitivity to changes in the visual environment than highway neighbors and their views would be limited to their traveling duration. Their response to changes in the visual environment is expected to be low. Traffic flow would likely improve with the proposed changes. Viewers would have shorter duration views and less exposure which may be considered an improvement in visual conditions. Viewers directly exposed to light sources, particularly where lights from oncoming traffic are visible, may experience glare (uncomfortably bright lights).

6. VISUAL IMPACT

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. Visual impacts for the No-Build and Build Alternatives are discussed below.

6.1 Alternative 1 – No Build

The No-Build Alternative would not propose a change to the existing visual environment; however, operational sufficiency and level of service are projected to decline and increasing levels of traffic and congestion would likely result in negative visual impacts.

6.2 Alternatives 2 through 4 – Build Alternatives

Alternatives 2 through 4 would add visual elements to the existing highway corridor but in most cases would not substantially change viewer exposure, quantity, or duration. Proposed pavement, pavement delineation, median dividers, roadway shoulders, noise walls, and other highway elements are present in the existing visual environment. Pavement delineation, shoulder expansion, signage, and other new elements would reflect the latest California Manual on Uniform Traffic Control Devices (CA MUTCD) and Caltrans' Standard Plans. All proposed elements would be compatible and unified with the existing visual environment. Proposed visual changes would not substantially change viewer activities or awareness.

View duration for highway users would decrease as congestion eases. Existing vegetation, land cover, and topography would continue to block or obscure most views of the proposed Project for most highway neighbors. Replacement of existing lighting with new LED lighting may slightly change the color/temperature of night lighting and additional safety lighting will be provided for new HOV lanes. Anticipated visual impacts are described below for each VAU and are generally consistent across all Build Alternatives.

6.2.1 Tustin VAU

For Alternatives 2 through 4, the proposed Project does not propose pavement widening, new ramps or under/overpass structures, bridges, or other vertical elements such as retaining walls or noise barriers in the Tustin VAU. Project visual elements would be limited to new pavement delineation and signage as HOV 2+ lanes are converted to HOV 3+ or Express Lanes (ELs). Viewers within the VAU would have limited direct line-of-sight views to proposed project elements such as pavement delineation as their elevation is generally lower than the proposed Project. Additionally, existing noise barriers block views along the majority of the VAU; however, viewers may be subject to views of proposed signage systems visible above existing noise barriers, but these elements are present in the existing VAU visual environment and would not present adverse impacts to most viewers. View frequency and duration would not change, and awareness would likely not change because the proposed Project would not change their activity or focus. Impacts due to the change to LED lighting should be minimal; however, additional safety lighting for new HOV lanes would introduce new visual elements to the corridor and increase the number of light sources. Changes in nighttime light levels would likely impact viewers but would be seen within the existing nighttime context. Light sources, such as existing roadway, site, and architectural, and advertising lighting is common. New lighting would likely be noticeable but would not

significantly change existing ambient light levels. Overall visual impacts would be neutral for most viewers in the Tustin VAU.

6.2.2 Santa Ana VAU

Most viewers within the Santa Ana VAU would have similar sensitivities and impacts as those in the Tustin VAU as existing HOV 2+ lanes are changed to HOV 3+ or ELs; however, viewers from adjacent high-rise buildings in the Santa Ana VAU may be subject to views of project elements from their elevated position. Similarly, viewers from elevated lanes or under overpasses may be more exposed to new project elements; however, these elements are present in the existing VAU visual environment and would be consistent with elements in the existing visual environment. View frequency and duration would not change, and awareness would likely not change because the proposed Project would not change their activity or focus.

The proposed Park and Ride at Grand Avenue/Santa Ana Boulevard would be located in the infield area between the southbound on-ramp to I-5 and Santa Ana Boulevard. New parking stalls (68) and associated facilities would have visual characteristics similar to other typical I-5 Park and Ride facilities (see **Table 12**). These new visual elements will replace existing lawn, ground cover, and trees within the park and ride facility improvement footprint. The existing vegetation, especially the trees, offers natural visual elements and softens or blocks views of structures, roadways, signage, vehicular traffic and movement, and other freeway elements. Traveling viewers (southbound viewers) would be negatively impacted by the removal of trees as they would be more exposed to views of commercial/retail areas and buildings in areas south and west; however, the design of the Park and Ride would include plantings and trees (see photos 1 and 2 in **Table 12**) and views of commercial/retail areas are common for this area. Commercial/Retail viewers to the south and west would also be negatively impacted by the removal of mature trees. They would be more exposed to and aware of overpass structures, freeway lanes, signage, etc., but most of these viewers would be temporary as they visit the area. Some residential viewers may have views of the park and ride facility from high-density areas to the south but would view the facility within the existing context which includes the freeway, structures, and large-scale signage (see **Figure 5**). Commercial/retail workers in this area may also have longer exposure but are generally focused on work-related activities.

Table 12: Typical Park and Ride Visual Characteristics

Typical Park and Ride Visual Character	

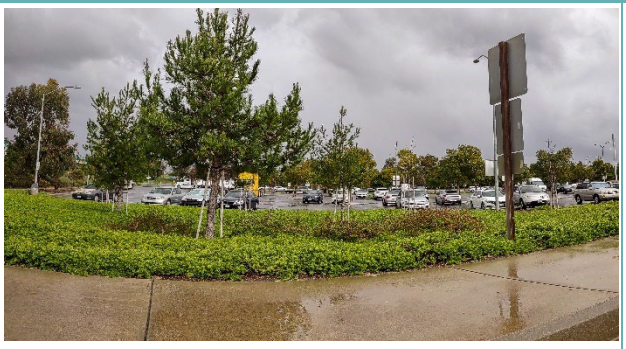



Photo 1 Natural Environment – typical buffer vegetation	Photo 2 Natural Environment – typical stormwater feature and vegetation
	
Photo 3 Cultural Environment – Typical parking and island layout	Photo 4 Cultural Environment – Typical parking and island layout
	
Photo 5 Cultural Environment – typical on-street signage	
	
Photo 6 Project Environment – Typical roadway and Park and Ride conditions	

Similar to the Tustin VAU (see section 6.2.1), viewers would likely have noticeable visual changes due to new light sources, but changes in nighttime light levels would likely not significantly change the existing ambient light levels. Visual impacts in the Santa Ana VAU would generally be low or neutral for most viewers but travelers and neighbors, particularly residential neighbors, would likely be negatively impacted by the Park and Ride facility at Grand Avenue/Santa Ana Boulevard.

6.2.3 Anaheim VAU

Most viewers within the Anaheim VAU would have similar sensitivities and impacts as those in the Tustin VAU, as existing HOV 2+ lanes are changed to HOV 3+ or ELs and an additional EL is added in Alternative 4. Viewers from entertainment areas within the VAU are not expected to have direct views of project elements and the duration of these views would be short. View frequency and duration would not change for neighbors, and awareness would likely not change because the proposed Project would not change viewer activity or focus. The frequency and duration of traveling views would change as lane changes and expansion improves the flow of traffic.

Alternative 4 would expand pavement seven feet to accommodate the additional pavement width. Most areas would absorb this expansion with very little impact on the visual environment; however, the adjacent slope would steepen between I-5 and Wilshire Avenue north of Lincoln Avenue. A retaining wall would be installed and the slope would steepen to minimize the size of the retaining wall. Existing vegetation would be removed including several trees. This vegetation provides natural visual elements to an environment that is characterized by overpass structures, large signage, concrete, and asphalt pavement. Mitigation measure VIA-1 will require existing ground cover and trees to be replaced where feasible with new plantings. Replacement plantings, such as ground cover, would take a couple of years to completely replace the visual aesthetic of current plantings. Similarly, existing trees would be replaced; however, new plantings would take five to ten years to fully replace the aesthetic of the existing mature trees.

The new retaining wall would introduce a new visual element but viewed within the I-5 corridor and adjacent to existing sound walls, changes in the existing visual environment would be minimal. Travelers would have few visual impacts associated with new retaining walls and slopes. Existing sound walls along N Wilshire Avenue would remain in place and would block views of the retaining wall and slope. Impacts associated with the retaining wall and steepened slope would be neutral.

The Disney Way/South Anaheim Boulevard Park and Ride would be located in the infield area between the I-5 and Disney Way. New parking stalls (172) and associated facilities would have visual characteristics similar to other typical I-5 Park and Ride facilities (see Table 12). These new visual elements would replace the existing ground cover and trees, including mature ornamental palm trees within the park and ride facility improvement footprint. This existing vegetation, especially the trees, offers natural visual elements and softens or blocks views of structures, roadways, signage, vehicular traffic and movement, and other freeway elements. Traveling viewers (southbound viewers) would be negatively impacted by the removal of trees as they would be more exposed to views of commercial/retail areas and buildings; however, the design of the Park and Ride would include plantings and trees (see photos 1 and 2, Table 12) and views of commercial/retail areas are common for this area. Commercial/Retail viewers to the south and west would also be negatively impacted by the removal of mature trees. They would be more exposed to and aware of overpass structures, freeway lanes, signage, etc., but most of these viewers would be temporary as they visit the area or stay briefly at hotel

facilities. Workers in this area may have longer exposure but are generally focused on work-related activities.

Similar to the Tustin VAU (see section 6.2.1), viewers would likely have noticeable visual changes due to new light sources, but changes in nighttime light levels would likely not significantly change the existing ambient light levels. Visual impacts in the Anaheim VAU would generally be low or neutral for most viewers but travelers and neighbors would likely be negatively impacted by the Disney Way/South Anaheim Boulevard Park and Ride facility.

6.2.4 Buena Park VAU

Most daytime and nighttime viewers within the Buena Park VAU would have similar sensitivities and impacts as those in the Anaheim VAU, as existing HOV 2+ lanes are changed to HOV 3+ or ELs and an additional EL is added in Alternative 4. View frequency and duration would not change, and awareness would likely not change because the proposed Project would not change activity or focus. Overall visual impacts would be low or neutral for most viewers in the Buena Park VAU.

6.3 Temporary Construction Impacts

Project construction would occur in phases over about 12 months but would not be happening along the entire length of the proposed Project at any given time. Paint removal equipment and revised lane painting equipment, trucks and cranes for sign installation, and other construction equipment may be visible to both traveling viewers and neighbors within areas under active construction. Freshly graded shoulders and slopes, construction signage, traffic control devices, flaggers, dust, and other temporary impacts would also likely affect views in areas indicated for lane widening. Night lighting may also be used to avoid construction activities during periods of heaviest congestion. Modifications to bridge structures/noise barriers may involve cranes, scaffolding, and other temporary construction equipment and materials. Construction associated with Alternatives 2 through 4 would likely cause adverse visual impacts compared to the No-Build Alternative but would be temporary in nature. Viewer sensitivity is low and position, proximity, and frequency would not change.

7. AVOIDANCE AND MINIMIZATION MEASURES

An avoidance and minimization measure has been identified to lessen visual impacts caused by the proposed Project. The following measure will be designed and implemented with the concurrence of the District Landscape Architect and will be incorporated into the proposed Project:

VIA-1 Demolition of existing trees, shrubs, vines, or other vegetation will be avoided where feasible. Should trees, shrubs, vines, or other vegetation be removed, Project Landscape Architects will work with the District Landscape Architect and local jurisdictions to provide landscape, roadside, or urban forest designs that meet state and local requirements, where needed.

VIA-2 Coordinate with the City of Santa Ana and the City of Anaheim to discuss the theme and aesthetic look of the park and ride facilities during the design phase.

VIA-3 Lighting should provide minimum impact to the surrounding environment, utilize downcast, cut-off type fixtures that are shielded and direct the light only towards areas requiring illumination. Install lights at the lowest allowable height and cast low-angle illumination while minimizing incidental light spill onto adjacent properties, open spaces, or backscatter into the nighttime sky.

8. CONCLUSIONS

As discussed above, the magnitude of visual change associated with the proposed Project changes would not expose most viewers to new visual elements or for longer durations than existing ones. The visual character and quality associated with proposed project elements would be consistent with those already present in the existing highway visual context. The activity and awareness of viewers would not change in most cases. Highway user viewer response would be low, and a less congested highway system may have an overall beneficial impact. Similarly, the scale of proposed visual elements would increase with the proposed Project but in most cases would not present new visual elements for highway neighbors. Small areas of localized visual changes, such as new retaining walls or noise barriers, steeper roadside grading, or frontage street improvements may cause adverse visual effects; however, affected viewer numbers would be low, and the focus of those viewers would generally remain away from the highway. Similarly, visual elements associated with advanced signage along arterials leading to I-5 would be new visual elements; however, this signage would be viewed within the existing visual context, which contains both roadway signage as well as advertising, street lights, overhead utilities, and others. These existing visual elements would lessen the overall visual impact associated with the advace signage.

Both Park and Ride facilities would displace natural visual elements, including mature trees that block and soften views of project elements. Vegetation would be included in the design for each facility but would not fully replace the existing vegetation. The Park and Ride facilities would also introduce new human-made elements such as pavement, signage, site lighting, and others. The visual environment may be negatively impacted for traveling viewers but drivers are not typically sensitive to changes in the visual environment. Passengers would likely be more aware of impacts associated with the Park and Ride Facilities but exposure would be temporary as they travel through the project area. Neighbors would have longer duration views and would be more sensitive to visual changes; however, most direct views of the Park and Ride facilities would be blocked by existing land cover. Viewers with direct views would be negatively impacted but the number of negatively impacted viewers would be low. Overall, highway neighbor viewer response would be low to moderate and result in neutral visual impacts.

9. REFERENCES

Cabanatuan, M. (2022, August 17). New express lanes on I-580 signal freeway revolution. *San Francisco Chronicle*.

Caltrans. (2022, August 17). *I-5 Managed Lanes Project (SR-55 to OC/LA County Line)*. Retrieved from CA.Gov: https://dot.ca.gov/caltrans-near-me/district-12/district-12-programs/district-12-environmental/i-5-managed-lanes-project

FasTrak, M. E. (2022, August 17). *Metro ExpressLanes.* Retrieved from Metro ExpressLanes: https://www.metroexpresslanes.net/how-it-works/using-metro-expresslanes/

FHWA. (2015). *Guidelines for the Visual Impact Assessment of Highway Projects.* FHWA.

Google. (2022, August). *Google Maps.* Retrieved from Google Maps: www.google.com

Metropolitan Transportation Commission. (2022, August 17). *Metropolitan Transportation Commission.* Retrieved from Bay Area Express Lanes: https://mtc.ca.gov/operations/traveler-services/bay-area-express-lanes

Scauzillo, S. (2022, August 17). Metro will study adding more pay lanes to Southern California freeways. *San Gabriel Valley Tribune*, pp. https://www.sgvtribune.com/2014/11/13/metro-will-study-adding-more-pay-lanes-to-southern-california-freeways/.

The Orange County Register. (2022, 12 30). *OC Toll Roads Agency Will Seek More Input on Policy to Guide Its Future*. Retrieved from The Orange County Register: https://www.ocregister.com/2021/04/22/oc-toll-roads-agency-will-seek-more-input-on-policy-to-guide-its-future/

US Department of Transportation Federal Highway Administration. (2022, August 17). *Project Profile: I-10 Corridor Express Lanes*. Retrieved from US Department of Transportation Federal Highway Administration: https://www.fhwa.dot.gov/ipd/project_profiles/ca_i10_corridor_express_lanes.aspx