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CONNECTOR JPA
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Regular Teleconference Meeting of the Capital SouthEast Connector JPA Board of Directors

Date: Friday, May 27, 2022, 8:30 a.m. to 10:30 a.m.

Meeting Location:

Consistent with California Government Code Section 54953(e)(1)(a), an online meeting of the Capital SouthEast Connector JPA Board of Directors will be held exclusively via teleconference in light of COVID-19 and the state of emergency proclamation and state recommended measures for physical distancing. This meeting will be held via Zoom. Join the meeting on your computer or mobile device:

https://us06web.zoom.us/j/86333670420?pwd=ODZ5WjdnYmkreVY0SDJuRG8rTTZvQT09

Webinar ID: 863 3367 0420
Passcode: 805115

To join the meeting by phone: US: +1 669 900 6833 or +1 253 215 8782

Public Comment:

If you wish to address the Board of Directors during the meeting, please wait until the Board Chair requests comments from the public. All public participants will be placed on mute during the meeting, until such time as the Board Chair requests public comment. Computer and mobile device attendees should use the Zoom "Raise Hand" feature when the Board Chair requests public comment. The "Raise Hand" feature can be found by moving your mouse on the Zoom meeting screen to reveal the toolbar. Then click on the "Participants" tab and then click "Raise Hand". Alternatively, windows users can use the keyboard shortcut ALT+Y and mac users can use the keyboard shortcut OPTION+Y to raise or lower your hand for comment. Phone attendees should press *9 to "Raise Hand" for public comment.

The Board of Directors requests that you limit your comments to three (3) minutes per person so that all present will have time to participate. The Board of Directors reserves the right to reasonably limit the total time for public comment on any particular noticed agenda item as it may deem necessary.

AGENDA

The Board may take action on any matter listed on this agenda to the extent permitted by applicable law. Staff Reports are subject to change without prior notice.

1. Call to Order & Roll Call: Directors Hidahl, Howell, Hume, Nottoli, Sander

2. Pledge of Allegiance

3. Adopt Resolution 2022-08 Making Findings and Determinations Authorizing Virtual Teleconference Meetings under Government Code Section 54953(e) (AB 361).

4. Public Comment on Non-Agenda Items

Members of the public may comment on any item of interest to the public within the subject matter jurisdiction of the Board of Directors. Each person will be allowed three minutes, or less if a large number of requests are received on a particular subject. After ten minutes of testimony, the Chair may choose to hear any additional testimony following the Discussion Items.

Please note, under the provisions of the California Government Code, the Board is prohibited from discussing or taking action on any item that is not on the agenda. The Board cannot take action on non-agendized items raised under "Public Comment" until the matter has been specifically included on the agenda. Those participants who wish to address a specific agendized item are encouraged to offer their public comments during consideration of that item.

5. Executive Director's Report for May 2022 Update

Consent Calendar Items

6. Approve Action Minutes of April 29, 2022, Regular Teleconference Board Meeting

7. Connector Project Construction Update (Receive and File)

8. Update on Federal and State funding efforts (Receive and File)

9. Authorize the Executive Director to Execute an Amendment with K&L Gates LLP and Cruz Strategies Inc. for Federal and State Funding Advocacy Services
- Resolution 2022-09
- Resolution 2022-10

10. Update on Safety Benefits of the Connector Project (Receive and File)

11. Update on Transportation Equity and Environmental Justice Benefits of the Connector Project (Receive and File)

12. Update on Sustainability Benefits of the Connector Project (Receive and File)

Discussion and Action Items

13. Adopt Work Plan and Fiscal Year 2022-23 Budget and Member Agency Contribution
- Resolution 2022-11
- Resolution 2022-12
- Resolution 2022-13

14. Review of Air Quality and Climate Adaptation Benefits for the Connector Project by Kittelson & Associates

15. Announcements or Final Comments from Board Members

ADJOURN

The next meeting of the Capital SouthEast Connector JPA Board will be held on
August 26, 2022
*City of Rancho Cordova City Hall, Council Chambers
2729 Prospect Park Drive, Rancho Cordova, CA 95670
*Location is subject to change due to COVID-19 restrictions on public gatherings

NOTICE REGARDING CHALLENGES TO DECISIONS

Pursuant to all applicable laws and regulations, including without limitation, California Government Code Section 65009 and or California Public Resources Code Section 21177, if you wish to challenge in court any of the above decisions (regarding planning, zoning and/or environmental decisions), you may be limited to raising only those issues you or someone else raised at the public hearing(s) described in this notice/agenda, or in written correspondence delivered to the Board at, or prior to, the public hearing.

GOVERNMENT CODE 54957.5 et seq.

Public records, including writings relating to an agenda item for open session of a regular meeting and distributed less than 72 hours prior to the meeting, are available for public inspection at 10640 Mather Blvd., Suite 120, Mather, CA 95655. The on-line version of the agenda and associated materials are posted for your convenience at http://www.ConnectorJPA.net. Some documents may not be posted on-line because of their size and/or format (maps, site plans, and renderings). As they become available, hard copies of all documents are available at 10640 Mather Blvd., Suite 120, Mather, CA 95655.

ADA COMPLIANCE STATEMENT

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Connector JPA at (916) 876-9094. Notification 48 hours prior to the meeting will enable the Connector JPA to make reasonable arrangements to ensure accessibility to this meeting.

If requested, this agenda can be made available in appropriate alternative formats to persons with disabilities, as required by Section 202 of the Americans with Disabilities Act of 1990 and the Federal Rules and Regulations adopted in implementation thereof. Persons seeking an alternative format should contact the Connector JPA for further information. A person with a disability, who requires a modification or accommodation, including auxiliary aids or services, to participate in a public meeting, should telephone or otherwise contact the Connector JPA 48 hours prior to the meeting. The Connector JPA may be reached at 10640 Mather Blvd., Suite 120, Mather, CA 95655 or by telephone at (916) 876-9094.

ITEM 3

MEETING DATE: May 27, 2022

TITLE: Adopt Resolution Making Findings and Determinations Authorizing Virtual Teleconference Meetings under Government Code Section 54953(e) (AB 361).

PREPARED BY: Osman Mufti, General Counsel

RECOMMENDATION

Approve Resolution 2022-08 making findings and declaring its intent to continue remote teleconference meetings pursuant to Government Code section 54953(e) due to the Governor's COVID-19 State of Emergency Proclamation and state regulations related to physical distancing.

BACKGROUND – ASSEMBLY BILL 361

The JPA Board has been conducting its public meetings under the Governor's Executive Orders issued in connection to the COVID-19 pandemic and its related health and safety risks which allowed legislative bodies to hold meetings exclusively by teleconference.

Effective October 1, 2021, Assembly Bill (AB) 361 allows local legislative bodies to continue to hold modified remote meetings during a proclaimed state of emergency, if state or local officials have imposed or recommended measures related to physical distancing which warrant holding meetings remotely.

STATE GUIDANCE

On February 28, 2022, the California Department of Public Health updated its Guidance for the Use of Face Masks. Although face masks are now recommended, and not required, in most indoor settings for vaccinated and unvaccinated individuals, in workplaces employers remain subject to the Cal OSHA Emergency Temporary Standards. Section 3205 of the Cal OSHA Emergency Temporary Standards continues to regulate close contacts, within 6 feet of another, and physical distancing continues to be recommended. These Cal OSHA requirements continue to support the remote attendance at meetings. Based on these state and local orders the findings to support teleconference only meetings pursuant to section 54953(e)(1) can continue to be made.

Although there are indications that adverse cases and impacts are decreasing, there remains risks associated with COVID-19, the ability to meet in person, and the State regulations continue to impose or recommend measures to promote social distancing.

A review of Sacramento County's Public Health Department's COVID-19 Dashboard reflect an increase in the 7-day average of COVID-19 infections during the month of May. Staff will continue to monitor the conditions related to COVID-19 and provide updates to the Board related to meeting accommodations as conditions change.

TELECONFERENCE MEETINGS

In order for the Board to conduct meetings under the AB 361 teleconference meeting rules, the Board meetings must meet one of the following provisions:

(A) The local agency is holding a meeting during a proclaimed state of emergency, and state or local officials have imposed or recommended measures to promote social distancing; or

(B) The local agency is holding a meeting during a proclaimed state of emergency for the purpose of determining, by majority vote, whether as a result of the emergency, meeting in person would present imminent risks to the health or safety of attendees; or

(C) The local agency is holding a meeting during a proclaimed state of emergency and has determined, by majority vote, that, as a result of the emergency, meeting in person would present imminent risks to the health or safety of attendees.

The AB 361 modified teleconference meeting rules can only be used in the event there is a Governor issued a state of emergency. The Governor's COVID-19 state of emergency satisfies this requirement.

The second requirement of item (A) above is satisfied currently as the Cal OSHA Emergency Temporary Standards continues to regulate close contacts, within 6 feet of another, and physical distancing continues to be recommended.

ATTACHMENTS

a. Resolution 2022-08

ITEM 3 a

RESOLUTION 2022-08

RESOLUTION OF THE BOARD OF DIRECTORS OF THE CAPITAL SOUTHEAST CONNECTOR JOINT POWERS AUTHORITY MAKING FINDINGS AND DETERMINATIONS AUTHORIZING VIRTUAL TELECONFERENCE MEETINGS DUE TO THE GOVERNOR'S PROCLAMATION OF STATE EMERGENCY AND CAL OSHA RECOMMENDATIONS

WHEREAS, the Board of Directors of the Capital SouthEast Connector Joint Powers Authority (the "Board") is committed to preserving public access and participation in meetings of the Board; and

WHEREAS, all meetings of the Board are open and public, as required by the Ralph M. Brown Act (Cal. Gov. Code 54950 – 54963, the "Brown Act"), so that any member of the public may attend, participate, and observe the Board conduct its business; and

WHEREAS, the Brown Act, Government Code section 54953(e), provides for remote teleconferencing participation in meetings by members of a legislative body, without compliance with the requirements of Government Code section 54953(b)(3), subject to the existence of certain conditions; and

WHEREAS, a required condition is that a state of emergency is declared by the Governor pursuant to Government Code section 8625, proclaiming the existence of conditions of disaster or of extreme peril to the safety of persons and property within the state caused by conditions as described in Government Code section 8558; and

WHEREAS, such conditions now exist in the State, specifically, the Governor of the State of California proclaimed a state of emergency on March 4, 2020, related to the threat of COVID-19, which threat remains; and

WHEREAS, to allow for physical distancing and remote meeting attendance, the Board does hereby find that the Board shall conduct its meetings without compliance with paragraph (3) of subdivision (b) of Government Code section 54953, as authorized by subdivision (e) of section 54953, and that the Board shall comply with the requirements to provide the public with access to the meetings electronically as prescribed in paragraph (2) of subdivision (e) of section 54953.

NOW, THEREFORE, IT IS HEREBY RESOLVED AND ORDERED by the Board:

1. The foregoing recitals are true and correct.

2. The Board hereby recognizes the Governor's proclaimed state of emergency remains in effect and Cal OSHA recommendations regarding physical distancing continue to remain in effect and continue to impact the ability of the Board and the public to meet safely in person.

3. The meetings of the Board may be held pursuant to the provisions of subdivision (e)(2), due to the current Governor's state of emergency proclamation and Cal OSHA recommendations and guidance.

4. The Board shall conduct public meetings in accordance with Government Code section 54953(e) and other applicable provisions of the Brown Act for teleconference meetings.

* * * * *

PASSED AND ADOPTED this 27th day of May 2022, on a motion by Director _____, seconded by Director_____, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

_____
Chairperson

ATTEST:

_____
Secretary

ITEM 5

MEETING DATE: May 27, 2022

TITLE: Executive Director's Report for May 2022

PREPARED BY: Derek Minnema

Each month the Executive Director provides a report to the Board. The Executive Director will give an oral update on the agency's activities during May at the meeting.

ITEM 6

MEETING DATE: May 27, 2022

TITLE: Action Minutes of the April 29, 2022, Regular Teleconference Board Meeting

PREPARED BY: Derek Minnema

RECOMMENDATION

Approve Action Minutes of the April 29, 2022, Regular Teleconference Board Meeting.

ACTION MINUTES

The Capital SouthEast Connector JPA Board of Directors met in regular session on April 29, 2022, via zoom video/teleconference.

Call to Order
Roll Call

Vice-Chair Hidahl called the meeting to order at 8:34 a.m.
Present: Directors Hidahl, Howell, Hume*, Frost, Sander**
* Director Hume joined the meeting at 8:55 a.m.
** Director Sander joined the meeting at 8:35 a.m.

Item #3: Adopt Resolution 2022-03 Making Findings and Determinations Authorizing Virtual Teleconference Meetings under Government Code Section 54953(e) (AB 361)

Executive Director Minnema introduced the item and Osman Mufti, JPA Legal Counsel, provided a presentation summarizing the item. A brief discussion amongst the Board and JPA staff ensued.

A motion was made by Director Hidahl and seconded by Director Frost and passed with four* directors voting in favor that:

THE BOARD OF DIRECTORS ("BOARD") OF THE CAPITAL SOUTHEAST CONNECTOR JOINT POWERS AUTHORITY ("CONNECTOR JPA") HEREBY MADE FINDINGS AND DETERMINATIONS AUTHORIZING VIRTUAL TELECONFERENCE MEETINGS DUE TO THE GOVERNOR'S PROCLAMATION OF STATE EMERGENCY AND LOCAL RECOMMENDATIONS AND STATE REGULATIONS RELATED TO PHYSICAL DISTANCING DUE TO THE THREAT OF COVID-19 WITH RESOLUTION 2022-03

* Director Hume was absent during the vote

No public comment was received on this item.

Public Comments on Non-Agenda Items

There were no comments from the public on non-agenda items.

Open Session

Item #5: Executive Director's Report

The Board received Executive Director Minnema's comprehensive oral report for April 2022. A brief discussion amongst the Board and JPA staff ensued.

No public comments were received on the Executive Director's Report.

Consent Calendar Items

A motion was made by Director Howell and seconded by Director Hidahl and passed by unanimous* vote that:

THE BOARD OF DIRECTORS OF THE CAPITAL SOUTHEAST CONNECTOR JOINT POWERS AUTHORITY APPROVES THE FOLLOWING ITEMS ON THE CONSENT AGENDA:

Item #6: Approve Action Minutes of April 29, 2022 Board Meeting

Item #7: Accept an update on Connector Project Construction

Item #8: Accept the FY 2020-21 Independent Auditor's Report – Resolution 2022-04

Item #9: Authorize the Executive Director to execute Amendment No. 4 to the Agreement with Robert Merritt, Certified Public Accountant – Resolution 2022-05

Item #10: Accept an update on State Funding efforts and Thank elected leaders Senators Dianne Feinstein and Alex Padilla, Representative Ami Bera, and Assemblymembers Jim Cooper and Ken Cooley for support of the Connector Project

Item #11: Accept an update on Construction Awards by the City of Folsom for the Connector Scott Road Realignment Project

Item #12: Acknowledge and Honor Local Citizen John Merchant – Resolution 2022-06

Item #13: Accept an update on Annual Report of Activities for the South Sacramento Habitat Conservation Plan

* Director Frost abstained from Item #6.

Public comments was received by John Merchant on this item.

Discussion and Action Items

Item #14: Authorize the Executive Director to Execute an Amendment to the Memorandum of Understanding with the City of Folsom for Reimbursement of the Construction of a Class 1 Multi-Use Path – Resolution 2022-07

Executive Director Minnema introduced the item and Matt Lampa, Principal Civil Engineer, provided a presentation summarizing the item.

A motion was made by Director Howell and seconded by Director Frost and passed by unanimous vote.

Public comment was received by Jim Harville on this item.

Item #15: Review of Connector Project Visual Design Concepts for Segment C

Executive Director Minnema introduced the item and provided a presentation summarizing the item. A brief discussion amongst the Board and JPA staff ensued.

No action was taken on this item.

Public comment was received by George Murphy on this item.

Item #16: Review of Connector Project Economic Impact Study Prepared by Varshney & Associates

Executive Director Minnema introduced the item and Sanjay Varshney provided a presentation summarizing the item. A brief discussion amongst the Board and JPA staff ensued.

No action was taken on this item.

No public comment was received on this item.

Closed Session

Item# 17: Closed Session

Conference with Real Property Negotiators Pursuant to Government Code § 54956.8

Property: Grant Line Road and State Route 16, Sacramento County, CA
APN#: 126-0060-039

Agency Negotiator: Derek Minnema, Executive Director

Negotiating Parties: Grant Line Jackson Investors, a California Limited Partnership, S.R. and L.F. Lasher living Trust, and Mark Wesley Lasher Revocable Living Trust

Under Negotiation: Price and terms of payment

Open Session

The Executive Director was given direction by the Board and there was no reportable action from closed session.

Item # 18: Announcement and Final Comments from Board Members

No action was taken on this item.

No public comment was received on this item.

Adjournment

The meeting adjourned at approximately 10:14 a.m.

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APPROVAL OF ACTION MINUTES FOR APRIL 29, 2022

Approved By:

_____
David Sander
Chair of the Board

Attest:

_____
Derek Minnema
Board Secretary

ITEM 7

MEETING DATE: May 27, 2022

TITLE: Connector Project Construction Update (Receive and File)

PREPARED BY: Matt Lampa

RECOMMENDATION

Receive and file this update.

CONSTRUCTION UPDATE

Segment D3a, White Rock Road (Prairie City Road to East Bidwell Street)

- Grind in rumble strip for westbound lanes
- Install fencing adjacent to Prairie City Road and Outfall Structure 1
- Apply Thermoplastic Striping for westbound lanes
- Activate traffic signals in preparation for shifting traffic
- Place final lift of HMA for eastbound lanes

Segment D3 – Scott Road Realignment

- Pre-construction meeting with City of Folsom and contractor
- Earthwork activities anticipated early June

ITEM 8

MEETING DATE: May 27, 2022

TITLE: Update on Federal and State funding efforts (Receive and File)

PREPARED BY: Derek Minnema

RECOMMENDATION

Receive and file this update.

FEDERAL FUNDING UPDATE

Staff hosted a tour of the projects in construction with Congressman Ami Bera and his district staff. Congressman Bera continues to champion the project and submitted the Connector as a project for a congressionally directed spending request.

Recent meetings to discuss federal grants, directed spending, and financing have been productive and the Build America Bureau has a wide range of opportunities it offers. Looking forward, one potential would be to meet with underwriters at the Bureau to better understand financing options.

Staff and the Federal team also recently met with Congresswoman Doris Matsui's staff, as the new district boundaries have changed and now overlap the project.

STATE FUNDING UPDATE

The Governor released his May Revise funding, which captures the state's latest budget surplus and focuses on spending in larger categories. The Governor's budget doesn't include district-specific funding requests. These types of projects are added to the Legislature's version of the budget, which the Assembly and Senate are finalizing over the next few weeks.

The Legislature will either approve or modify the various funding proposals put forward by the Governor, and they will add their own specific requests. The budget is Constitutionally required to be passed by June 15th, so the details of the budget will be coming together over the next few weeks.

Assembly Members Cooper and Cooley continue to champion the project and submitted the project for directed spending. Senator Pan also signed onto the request for funding.

Member requests may ultimately be included in a subsequent trailer bill over the next few months before the end of August. Several outstanding items will determine how much is available for district requests, including whether there will be a gas tax rebate and ensuring the state is under the Gann Limit.

ATTACHMENTS

a. Project Fact Sheets

ITEM 8 a

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PROJECT OVERVIEW

The Capital SouthEast Connector (Connector) is an innovative, 34-mile multimodal solution to the transportation challenges of South Sacramento County.

South Sacramento County lacks sufficient connectivity and multi-modal facilities to accommodate the community needs. Existing roadways are in poor condition and often flood during severe storm events. The facilities lack bicycle and pedestrian accommodations to provide for non-motorized travel. There are limited roadway connections from east to west causing motorists to use the already congested freeways for travel.

The Connector replaces existing two-lane rural roads with a four-lane complete street with separated Class I multi-use path. The redesigned roadway provides active transportation opportunities, access to employment centers, connection to an existing park and ride lot and future bus transit center, addresses climate resiliencies, deploys innovative technology, and provides for improved quality of life.

KEY BENEFITS

- **Replaces 2-lane rural roads with 4-lane complete streets**
- **Adds a separated Class I multi-use path along the corridor**
- **Establishes an efficient and reliable freight corridor in the region**
- **Addresses regional climate resiliency and environmental stewardship issues**
- **Deploys innovative smart technologies to manage and improve traffic flow**
- **Reduces vehicle miles traveled and travel times for commuters**
- **Provides new interregional route Connecting I-5 to SR 99 to SR 16 to US 50**

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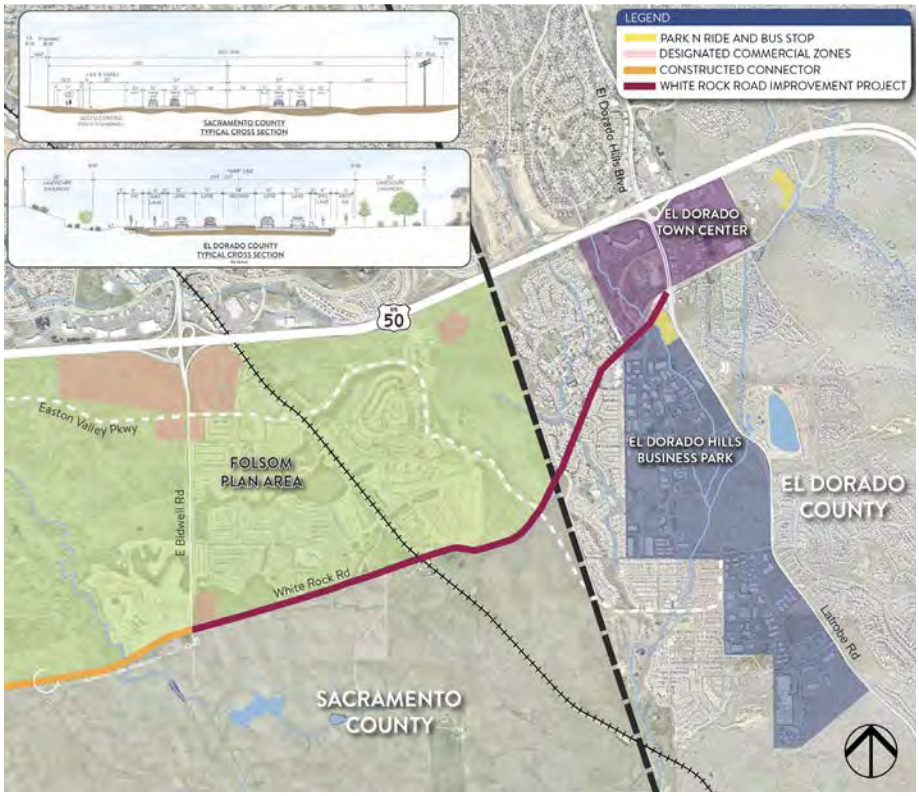
WHITE ROCK ROAD IMPROVEMENT RAISE GRANT

The White Rock Road Improvement Project (Project) represents a critical piece of the broader Capital SouthEast Connector, a 34-mile complete street corridor in Sacramento and El Dorado Counties.

The Project will construct a 3.2-mile four-lane divided multimodal corridor enhancement using a "fix it first, fix it right" approach to rehabilitate the existing pavement, correct geometric deficiencies, and two signalized intersections. The Project supports transportation equity by constructing 3 miles of Class I multi-use path and 1.3-miles of buffered Class II bike lanes and multimodal connections to existing and planned El Dorado Transit stations that remove the barrier created by vehicle ownership.



KEY BENEFITS

- **Enhances safety by constructing medians, improved intersections, two new signalized intersections, separated Class I multi-use path, buffered bike lanes, and removing obstructions from the clear recovery zone.**
- **Reduces vehicle miles traveled and greenhouse gas emissions, provides resiliency by correcting persistent roadway flooding issues, avoids impacts on underserved communities, and supports habitat conservation.**
- **Provides multimodal connectivity to affordable and workforce housing, job centers, healthcare, and recreational facilities and removes barriers to opportunity.**
- **Improves traffic operations to job centers, supports regional jobs creation, and supports truck throughput and operations from future aggregate mines.**
- **Improves affordable transportation choices for underserved communities with the accessibility of bicycle and pedestrian facilities and access to bus transit.**
- **Implements a "fix it first, fix it right" approach to replace failing pavement**
- **Extensive support from local, state, and federal elected officials, labor unions, business groups, agencies, and residents.**
- **Constructs a smart corridor with emerging technologies**

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SEGMENT D2A IMPROVEMENTS INFRA/RURAL GRANT

The Segment D2a Improvements (Project) represents a critical piece of the broader Capital SouthEast Connector, a 34-mile complete street corridor in Sacramento and El Dorado Counties.

The Project will construct a 2.6-mile four-lane divided multimodal corridor enhancement using a "fix it first, fix it right" approach to rehabilitate the existing pavement, correct vertical and horizontal alignment deficiencies, and new and modified traffic signals. The Project supports transportation equity by constructing 2.6 miles of Class I multi-use path. The Project will improve freight throughput and access, enhance traffic operations, improve climate change adaptability and resiliency, support the Rural Opportunities to Use Transportation for Economic Success (ROUTES) Initiative, and benefit the regional and national economy.

KEY BENEFITS

- **Enhances safety by correcting horizontal and vertical curves, constructing medians, improved intersections, separated Class I multi-use path, and removing obstructions from the clear recovery zone.**
- **Implements a "fix it first, fix it right" approach to replace failing pavement and addressing persistent flooding issues.**
- **Improves truck throughput and access to aggregate mines alleviating a freight bottleneck, enhances access to jobs, reduces travel times, and supports creation of well-paying union jobs.**
- **Reduces vehicle miles traveled and greenhouse gas emissions, provides climate resiliency, promotes walking and biking to provide a low carbon transportation option, and supports habitat conservation.**
- **Improves affordable transportation choices for underserved communities with the accessibility of bicycle and pedestrian facilities and access to bus transit.**
- **Constructs a smart corridor with emerging technologies including intelligent transportation systems, Vehicle-to-Infrastructure, and broad-band fiber optic line**

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STAKEHOLDER SUPPORT

The Capital SouthEast Connector (Connector) provides substantial improvements and benefits for the Capital Region, earning wide-ranging and extensive stakeholder support.

Political and stakeholder support for the Connector has been broad, covering local, state, and federal elected officials, stakeholder groups, construction industry and trades, and local business leaders. This support includes:

"The Connector is a 34-mile interregional multimodal project that connects Interstate 5, State Route 99, State Route 16, and Highway 50. The project will improve travel choices and access for people and goods on the State's Interregional Transportation System in a sate, equitable, sustainable, and multimodal manner. This includes providing non-motorized access and public transit options on the Connector, as well as relieving traffic congestion and improving roadway safety." ***– US Senator Dianne Feinstein (D)***

"These improvements support transportation equity through the construction of bike and pedestrian paths adjacent to planned public transit opportunities that reduce reliance on vehicle ownership. Furthermore, the project addresses climate change and resiliency by reducing risks from heavy storms, lowering vehicle emissions in the area, a projected reduction of crash rate by nearly 40 percent, and improving access for firefighting activities to combat wildfires that occur frequently near the project area." ***– US Senator Alex Padilla (D)***

"Sacramento County is California's fastest growing metro area; however, poor infrastructure continues to cause problems for residents and discourages economic development. Therefore, the 34-mile connector project would be a critical step toward improving the everyday lives of Sacramento's community members and economy." ***– US Representative Ami Bera (D)***

"This major transportation project located in the outskirts of California's Capital City is an innovative rural project that will significantly improve goods movement and economic competitiveness, as well as strengthen safety and regional security. … the Connector would provide immediate economic benefits include the creation of more than 5,000 jobs and would serve as a critical emergency evacuation route." ***– US Representative Tom McClintock (R)***

"… the Capital SouthEast Connector Project… would connect the greater Sacramento region's rural communities to major arterial roadways while also preserving natural habitat and highly productive agricultural lands. That is why the project has been integrated into the South Sacramento Habitat Conservation Plan: a regional coherent strategy for supporting greater Sacramento's rapid growth while preserving open space." ***– US Representative John Garamendi (D)***

"The Connector will provide several benefits for the Sacramento regional transportation system… It will increase safety by upgrading two-lane country roads build in the 1950s and 1960s that were not designed to carry their current traffic loads… It will provide a multi-use bike and pedestrian path along its entire alignment." ***– CA State Senator Dr. Richard Pan (D)***

KEY SUPPORTERS

US Senator Dianne Feinstein

US Senator Alex Padilla

US Representative Ami Bera

US Representative Tom McClintock

US Representative John Garamendi

CA State Senator Dr. Richard Pan

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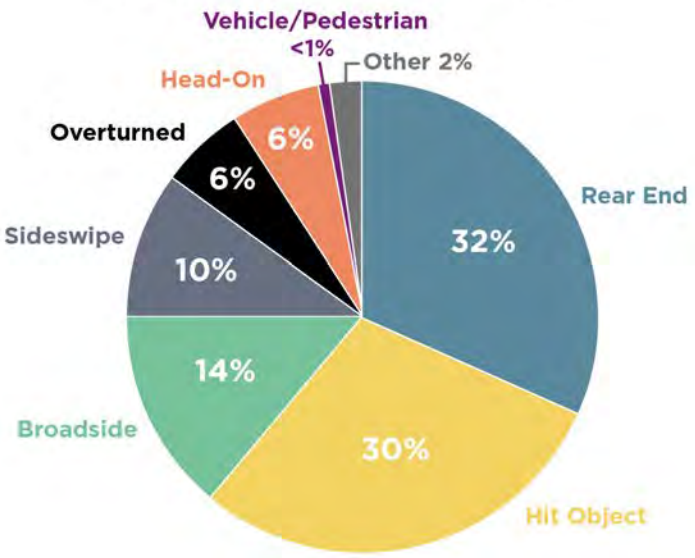
RURAL ROAD SAFETY ENHANCEMENTS

The Capital SouthEast Connector (Connector) will greatly enhance roadway safety in South Sacramento County.

The Capital SouthEast Connector (Connector) specifically targets the crash types currently occurring on the corridor, transforming the existing roadway with narrow shoulders, roadside obstructions, inconsistent pedestrian and bicycle facilities, and substandard horizontal and vertical alignment into a modern four-lane multi-modal facility. The Connector presents the opportunity to utilize a performance-based design approach and bring the corridor up to the latest design standards. The Connector is expected to reduce crashes by up to 216 collisions over a five-year period.

CRASHES BY COLLISION TYPE:



CRASHES BY YEAR AND SEVERITY:

Year	Fatal	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	2	3	69	109	183
2017	2	5	73	116	196
2018	1	7	68	106	182
2019	1	11	74	89	175
2020	-	8	49	80	137
Total	6	34	333	500	873

KEY BENEFITS

- **Minimizes access points by consolidating driveways and limiting local road connections to reduce conflicts between turning and through vehicles**
- **Adds a Class I separated pedestrian and bicycle facilities to provide dedicated multimodal facilities and minimize conflicts between vehicles and vulnerable non-motorized travel Constructs a landscape median that separates vehicles traveling in opposite directions and facilitates access control**
- **Provides wide shoulders and removes objects from clear recovery zones to reduce hit object crashes, the most common along the corridor**
- **Corrects vertical and horizontal curves to improve decision and stopping sight distances**
- **Installs smart corridor technology including backbone communication systems, vehicle detection, CCTV cameras, and changeable message signage**
- **Improves intersection controls with traffic signals and roundabouts and installs lighting**

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INTERREGIONAL ROUTE

The Connector addresses the State's Interregional Transportation System priorities to improve travel access for people, vehicles, and goods in a safe, equitable, sustainable, multimodal manner.

The Capital SouthEast Connector (Connector) provides a 34-mile interregional corridor "Connecting Communities" as described by Sacramento Bee. The Connector provides a safe and comfortable complete street facility spanning three congressional districts, three cities, two counties, and three State Senate and Assembly districts. This interregional route connects I-5 to SR 99 to SR 16 to US 50 and the businesses, homes, recreation, and agricultural uses in between. The Connector improves access to jobs and facilitates the efficient movement of goods to make a positive and sustainable economic impact on the region.

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KEY BENEFITS

- **34-mile Class I bicycle and pedestrian multiuse pathway system supporting non-motorized travel and transportation equity**
- **Provide direct routes to reduce vehicle miles traveled, lower greenhouse gas emissions, and improve air quality throughout the region, including underserved communities adjacent to freeways**
- **"Fix it first, fix it right" method-ology to modernize existing infra-structure by reconstructing failed pavement systems and addressing geometric deficiencies**
- **Support environmental stewardship and sus-tainability through funding an interconnected preserve system to ensure long-term viability of area plant and wildlife as well as rural ranching and agricultural operations**

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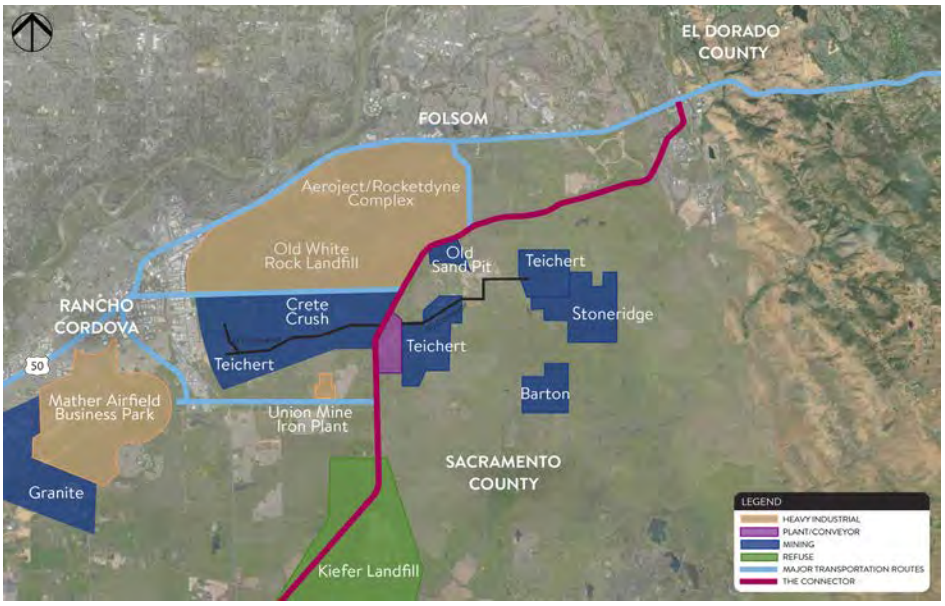
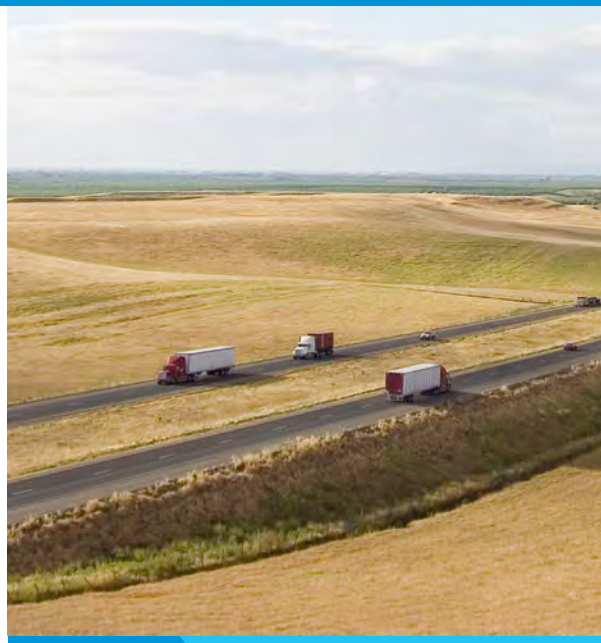
CRITICAL RURAL FREIGHT CORRIDOR

The Capital SouthEast Connector (Connector) fulfills the need for reliable and efficient transportation corridors in the region.

South Sacramento County is home to goods movement business industries that need reliable and efficient transportation corridors to bring goods to market. The Capital SouthEast Connector (Connector) fulfills this need for the region. The Connector JPA had the corridor designated as a Critical Rural Freight Corridor within the National Highway Freight System and making the Connector eligible for state and federal funding. The Connector provides connectivity for heavy trucks to and from I-5, I-80, SR 99, and US 50, providing interregional goods movement. The most significant freight moved along the Connector is aggregate, the number one good hauled by truck in the nation. The quarries along the alignment are anticipated to produce roughly 3,800 quarry truck trips daily, 1.2 million trips annually. The Connector is designed to efficiently accommodate the increase in truck volumes.





KEY BENEFITS

The Connector provides access to the following:

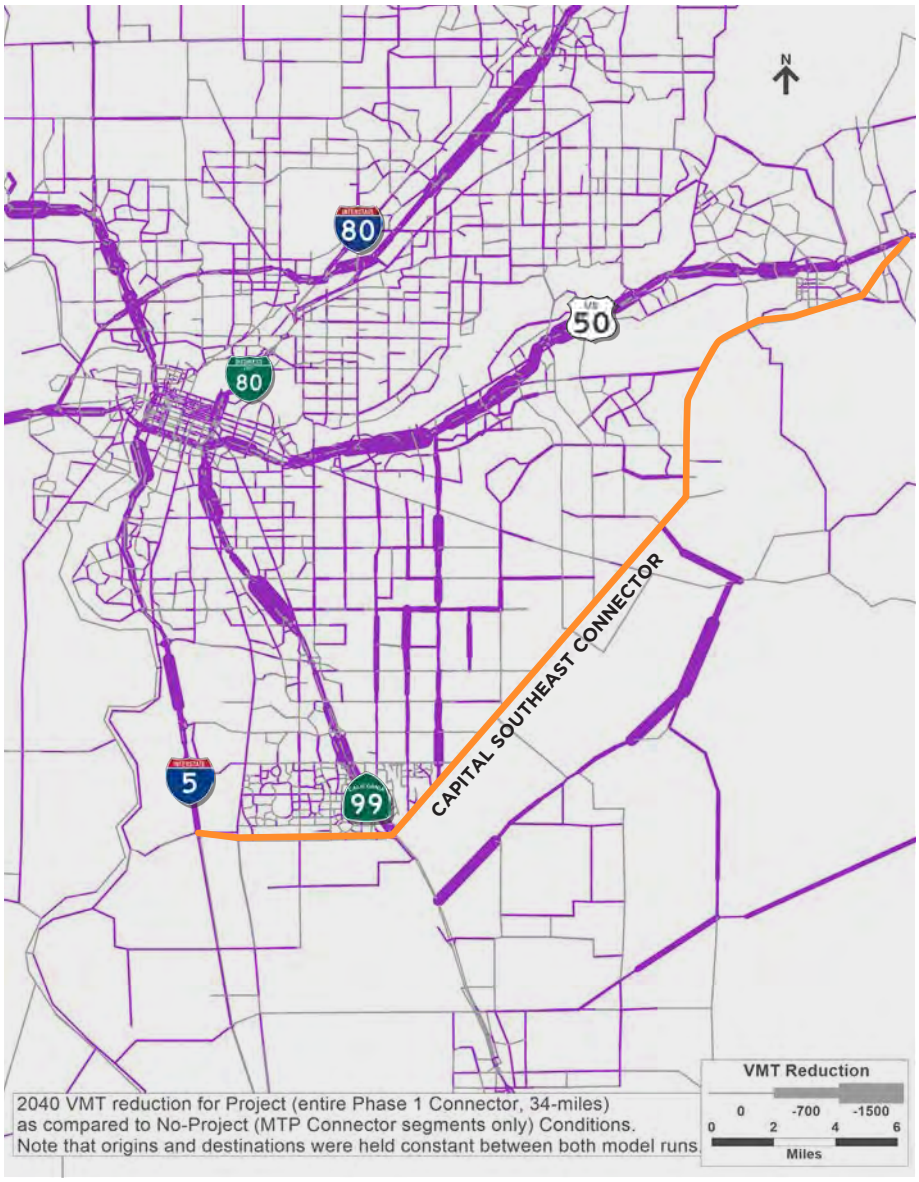
- **6.1-Megawatt power generator at the Keifer Landfill that contributes to the regional power grid.**
- **104-acre Crete Crush recycling facility providing recycled and virgin aggregates as well as landscaping products.**
- **Teichert Aggregates, one of the largest aggregate producers in the United States, and Grant Line plant that generates both aggregate and asphalt concrete products.**
- **Refuse disposal and metals and appliances recycling facilities at the Keifer Landfill.**
- **The intermodal freight facilities at Mather Airfield.**
- **1.5 million acres of regional farmland and 8,000 acres of boutique farms.**

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

REDUCING VEHICLE MILES TRAVELED

The Capital SouthEast Connector (Connector) will help reduce the high travel times, vehicle miles traveled and greenhouse gas emissions in the region.

Travel times and vehicle miles traveled are high in the Sacramento Area. There are limited regional routes which results in individuals traveling long distances on freeways, and increases greenhouse gas emissions as well. The Connector provides a solution to address this issue. The Connector prepared Air Quality and VMT analysis to understand these benefits. The study shows the Connector draws regional traffic away from I-5, SR 99, and US 50. This reduces regional vehicle miles traveled and congested vehicle miles traveled, easing congestion on the highways and lowering greenhouse gas emissions.



2040 VMT reduction for Project (entire Phase 1 Connector, 34-miles) as compared to No-Project (MTP Connector segments only) Conditions. Note that origins and destinations were held constant between both model runs.

KEY BENEFITS

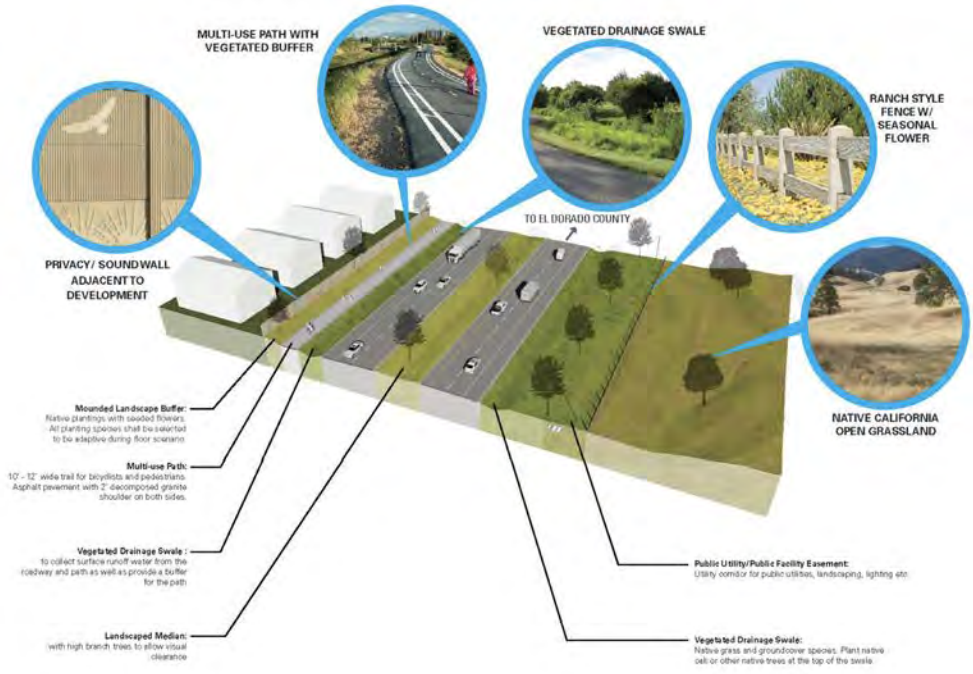
- **Over 500,000 fewer hours per year spent sitting in traffic**
- **Over245,000 fewer congested vehicle miles traveled per year**
- **Reduce CO2 emissions by 12 metric tons per day**
- **Eliminate 2 pounds of Particulate Matter 10 emissions per day**
- **Reduce nitrogen oxides by 12 pounds per day**

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

ENVIRONMENTAL STEWARDSHIP

Protecting our environmental habitat and preserving farmland is important to the Sacramento Region.

Extensive efforts have been spent regionally to develop climate action plans to identify strategies that reduce transportation impacts. The Capital SouthEast Connector (Connector) supports these regional efforts to implement sustainable infrastructure and preserve the environment. The Connector implements a complete streets approach to reduce greenhouse gas emissions and provide alternative travel modes. The Connector JPA, with other agencies, established the South Sacramento Conservation Agency and the South Sacramento Habitat Conservation Plan, which provides streamlined permitting and environmental protections.



KEY BENEFITS

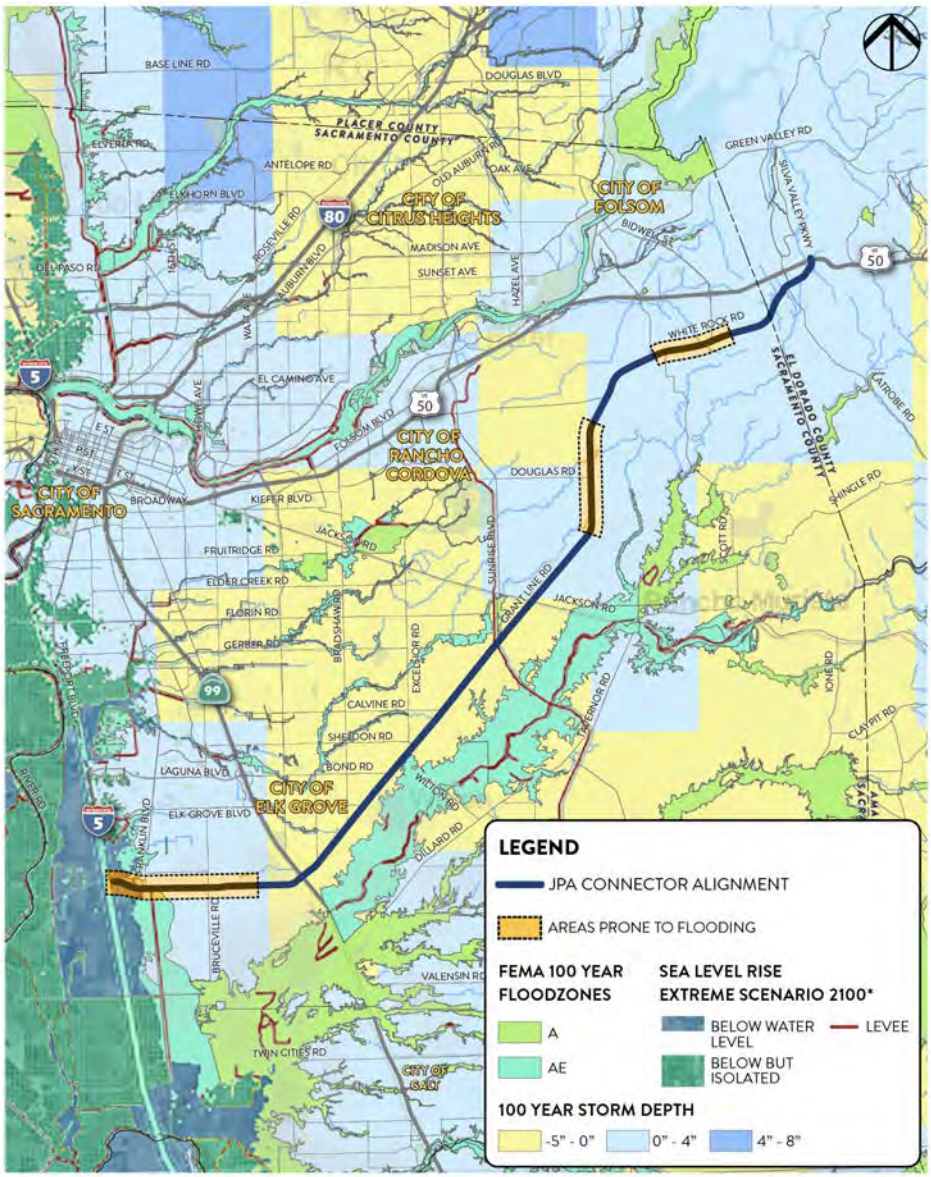
- **Stormwater management through drainage structures along natural terrain patters to improve ecological connectivity**
- **Vegetated bioswales and drainage systems for treatment of water runoff**
- **Permeable pavement for roadway shoulders and multi-use paths**
- **Noninvasive native, drought tolerant plant species**
- **Protect and preserve wildlife passages to maintain wildlife connectivity to sensitive habitats**
- **160 acres of conservation easement mitigation to date to maintain regional habitat and farmlands in perpetuity**

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

CLIMATE RESILIENCY

The Capital SouthEast Connector (Connector) is an opportunity to address multiple local, regional, and state initiatives, goals, and plans to improve local and regional resiliency against climate change and its impacts.

The Connector alignment experiences routine flooding which will be exacerbated in the future. There is also a history of wildfires along the alignment, as well. The Connector will transform an older road with substandard features into an efficient multimodal corridor that will strengthen the region's ability to respond to unforeseen conditions in the decades to come. The improved corridor will allow people and goods to circulate more easily, enhancing the region's ability to respond to emergencies.



* Based on National Oceanic and Atmospheric Administration (NOAA) Technical Report NOS CO-OPS 083 for projected United States sea levels in the year 2100.

KEY BENEFITS

- **Adopting a regional solution for reducing vehicle miles traveled and greenhouse gas emissions**
- **Improving vertical and horizontal alignment and drainage culverts to improve stormwater flows**
- **Providing an all-weather facility that addresses 100-year storm rainfall**
- **Providing fire break in the wild-life urban interface to reduce damages from fires**
- **Improving a critical regional evacuation route and access for firefighting**

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CONNECTOR JPA
Connecting Communities

ECONOMIC BENEFITS

The Capital SouthEast Connector (Connector) is more than a regional multimodal roadway facility. Economists agree that the Connector provides significant economic development benefits to the region.

The Connector JPA prepared an economic study in 2022 to determine the direct and indirect benefits of the Connector construction. This study finds that a $552.5 million investment in construction by the Connector JPA would create a substantial gross economic impact. The incremental economic impact to the region between 2021 and 2040 would produce $1.1 billion of economic output and create 7,347 new full-time jobs. The Connector would also generate $43.1 million in new indirect business taxes. Creating new well-paying jobs will serve a tremendous lift to the region's economy.

KEY BENEFITS

- **$585.7 million in travel time savings benefits to commuters**
- **$37.3 million in residual investment value of Connector construction**
- **$19.5 million in safety benefits from avoided collisions**
- **$17.2 million in avoided pavement rehabilitation costs**
- **$6.8 million in increased walking and biking benefits for the community**
- **$6.3 million in reduced vehicle emissions benefits for the region**
- **$3.5 million in savings from reduced truck miles traveled and operating costs**

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Connecting Communities

MULTIMODAL CONNECTIVITY

The Capital SouthEast Connector will provide new multimodal choices and connectivity to the southern Sacramento County and western El Dorado County region.

Providing bicycle, pedestrian, and transit opportunities to residents in southern Sacramento County and western El Dorado County is important to achieving regional goals. The Capital SouthEast Connector (Connector) contributes to providing regional multimodal choices and connectivity to area land uses. The Connector will construct a 34-mile Class I regional trail, providing a rural backbone for non-motorized travel. This will provide a connection between residences, job centers, and recreational opportunities throughout the region.

The Connector also provides opportunities for improved transit facilities. There are planned bus transit facilities and enhancements along the alignment. This includes the construction of a new transit hub in El Dorado Hills and the opportunity to use the Connector as a regional bus route. The improved roadway operations on the Connector will increase transit reliability and promote ridership. This will further regional greenhouse gas emission reduction goals.

KEY BENEFITS

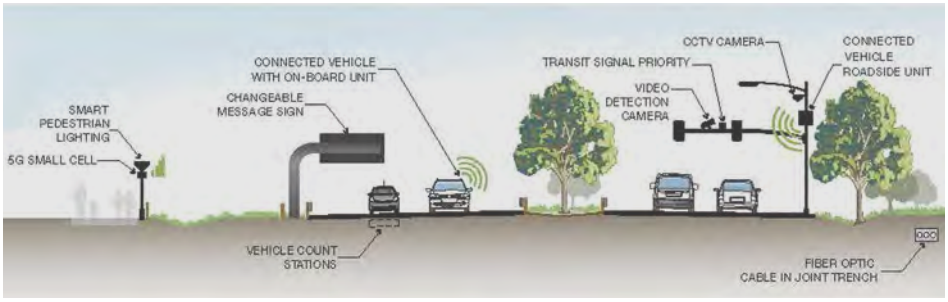
- **Regional multi-use path connecting multiple communities**
- **Backbone pathway providing connectivity to bisecting Class I paths and Class II bike lanes**
- **Sidewalk gap closures in El Dorado Hills to provide continuous pedestrian facility**
- **First/Last mile connection to existing and planned bus transit facilities**
- **Provide transportation equity and reduced greenhouse gas emissions**

CAPITAL | SOUTHEAST
CONNECTOR JPA
Connecting Communities

INNOVATIVE SMART CORRIDOR

The Capital SouthEast Connector (Connector) provides the region the opportunity to plan and implement emerging transportation technologies.

The Connector's Smart Corridor Plan provides the technology vision and goals of the Connector, recommends the foundational Intelligent Transportation System (ITS) infrastructure that will be implemented, and establishes the Connector as a transportation facility well suited to accommodate, test, and promote a broad range of transportation technologies. The Smart Corridor Plan establishes the vision for the critical interoperability that will be required between the member agencies along the Connector. The Connector will provide flexibility for deploying long-term, Connector– wide ITS applications to improve traffic operations and safety to meet technology advancements.



KEY BENEFITS

The Connector's innovative smart technologies will include:

- **Backbone fiber optic cables**
- **CCTV and video detection connected to Transportation Management Centers**
- **Interconnected traffic signals and Transit Signal Priority**
- **Changeable Message Signs**
- **Connected vehicle infrastructure and automated vehicle testing capabilities**
- **Smart pedestrian lighting with 5G small cell wifi**

ITEM 9

MEETING DATE: May 27, 2022

TITLE: Authorize the Executive Director to execute an Amendment with K&L Gates LLP and Cruz Strategies Inc. for Federal and State Funding Advocacy Services

PREPARED BY: Derek Minnema

RECOMMENDATION

Approve Resolutions 2022-09 and 2022-10 to authorize the Executive Director to execute an Amendment to (1) extend the contract terms for federal and state advocacy services to November 30, 2022, and (2) increase the not-to-exceed amount for state advocacy services to $75,000 and the amount for federal advocacy services to $100,000.

BACKGROUND

The signing of the Infrastructure Investment and Jobs Act combined with the California budget surplus for fiscal year 2022-23 provide an unprecedented opportunity for new funding in transportation. A recently published Technical Assistance Guide lists more than 65 programs at the Federal level. Each member of the Connector's state legislative delegation is requesting funding for the project.

The JPA's federal and state funding advocacy team continues to explore, identify, and advocate for funding to advance the Connector project and currently there are multiple funding applications totaling $68 million pending.

DISCUSSION

The current agreements for federal and state advocacy services expire before the next board meeting in August. Accordingly, an amendment is being presented to the Board for approval to allow the JPA to further pursue funding opportunities as they further develop over the upcoming months.

The additional amount of the amendments results in a contract not-to-exceed limit of $175,000 which exceeds contract authority, and requires Board approval.

Work under these agreements will be funded with local funds. The FY 2022 Budget approved up to $1,432,591 and the advocacy services to be provided are within the approved budget

ATTACHMENTS

a. Amendment with K&L Gates LLP
b. Amendment with Cruz Strategies, Inc.
c. Resolutions 2022-09 and 2022-10

ITEM 9 a

AMENDMENT NO. 1
TO THE AGREEMENT BETWEEN THE CAPITAL SOUTHEAST CONNECTOR AUTHORITY AND K&L GATES LLP

This Amendment No. 1 to the January 14, 2022, agreement ("Agreement") between the Capital SouthEast Connector Authority[1], ("Authority"), and K&L Gates LLP ("Consultant"), is entered into effective May ____, 2022.

WHEREAS, the Executive Director entered into the Agreement with the Consultant, which required Consultant to provide Federal Funding Advocacy Services to the Connector; and the Authority and Consultant now wish to amend the Agreement.

NOW, THEREFORE, the Authority and Consultant agree as follows:

1. Work shall be completed and this Agreement shall expire on November 30, 2022, unless otherwise terminated as provided for in this Agreement or extended by written agreement between the parties.

2. The amount to be paid to Consultant under the Agreement shall not exceed One Hundred Thousand Dollars ($100,000). In no instance shall the Authority be liable for any payments or costs for work in excess of this amount. Consultant shall be paid at the times and in the manner set forth in this Agreement. The consideration to be paid Consultant, as provided in this Agreement, shall be in compensation for all of the Consultant's expenses incurred in the performance of work under this Agreement, including travel and per diem, unless otherwise expressly so provided.

3. Except as expressly amended herein, all terms and conditions of the Agreement shall remain in full force and effect.

IN WITNESS WHEREOF, THE PARTIES HAVE ENTERED INTO THIS AGREEMENT.

CAPITAL SOUTHEAST CONNECTOR AUTHORITY

_____

DEREK MINNEMA
Executive Director

[1] The full legal name of the Capital SouthEast Connector Joint Powers Authority is the "Elk Grove-Rancho Cordova-El Dorado Connector Authority."

APPROVED AS TO FORM:

_____

SLOAN SAKAI YEUNG & WONG LLP
Legal Counsel to the Authority

K&L GATES LLP

_____

Jeff Denham
Authorized Representative

ITEM 9 b

AMENDMENT NO. 1
TO THE AGREEMENT BETWEEN THE CAPITAL SOUTHEAST CONNECTOR AUTHORITYAND CRUZ STRATEGIES, INC

This Amendment No. 1 to the January 18, 2022, agreement ("Agreement") between the Capital SouthEast Connector Authority[1], ("Authority"), and Cruz Strategies, LLC ("Consultant"), is entered into effective May ___, 2022.

WHEREAS, the Executive Director entered into the Agreement with the Consultant, which required Consultant to provide State Legislative Advocacy Services to the Connector; and the Authority and Consultant now wish to amend the Agreement.

NOW, THEREFORE, the Authority and Consultant agree as follows:

1. The third sentence of Section 1 of the Agreement is hereby amended as follows: "Work shall be completed and this Agreement shall expire on November 30, 2022, unless otherwise terminated as provided for in this Agreement or extended by written agreement between the parties."

2. Section 5 of the Agreement, "Consideration", is hereby amended in its entirety as follows: "The amount to be paid to Consultant under this Agreement shall not exceed Seventy-Five Thousand Dollars ($75,000). In no instance shall the Authority be liable for any payments or costs for work in excess of this amount. Consultant shall be paid at the times and in the manner set forth in this Agreement. The consideration to be paid Consultant, as provided in this Agreement, shall be in compensation for all of the Consultant's expenses incurred in the performance of work under this Agreement, including travel and per diem, unless otherwise expressly so provided."

3. Except as expressly amended herein, all terms and conditions of the Agreement shall remain in full force and effect.

IN WITNESS WHEREOF, THE PARTIES HAVE ENTERED INTO THIS AGREEMENT.

CAPITAL SOUTHEAST CONNECTOR AUTHORITY

_____

DEREK MINNEMA
Executive Director

[1] The full legal name of the Capital SouthEast Connector Joint Powers Authority is the "Elk Grove-Rancho Cordova-El Dorado Connector Authority."

APPROVED AS TO FORM:

_____

SLOAN SAKAI YEUNG & WONG LLP
Legal Counsel to the Authority

CRUZ STRATEGIES, LLC

_____

STEVE CRUZ
Partner

ITEM 9 c

RESOLUTION 2022-09

RESOLUTION OF THE BOARD OF DIRECTORS OF THE CAPITAL SOUTHEAST CONNECTOR JOINT POWERS AUTHORITY AUTHORIZING THE EXECUTIVE DIRECTOR TO EXECUTE AN AMENDMENT TO THE AGREEMENT WITH K&L GATES LLP

BE IT RESOLVED that the Board of Directors ("Board") of the Capital SouthEast Connector Joint Powers Authority ("Connector JPA") hereby authorizes the Executive Director to execute an amendment to the Agreement with K&L Gates LLP to increase the not-to-exceed amount to $100,000.

This Resolution shall take effect from and after the date of its passage and adoption.

* * * * *

PASSED AND ADOPTED this 27th day of May, 2022, on a motion by Director _____, seconded by Director_____, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

_____
Chairperson

ATTEST:

_____
Secretary

ITEM 9 c

RESOLUTION 2022-10

RESOLUTION OF THE BOARD OF DIRECTORS OF THE CAPITAL SOUTHEAST CONNECTOR JOINT POWERS AUTHORITY AUTHORIZING THE EXECUTIVE DIRECTOR TO EXECUTE AN AMENDMENT TO THE AGREEMENT WITH CRUZ STRATEGIES, INC.

BE IT RESOLVED that the Board of Directors ("Board") of the Capital SouthEast Connector Joint Powers Authority ("Connector JPA") hereby authorizes the Executive Director to execute an amendment to the Agreement with Cruz Strategies, Inc. to increase the not-to-exceed amount to $75,000.

This Resolution shall take effect from and after the date of its passage and adoption.

* * * * *

PASSED AND ADOPTED this 27th day of May, 2022, on a motion by Director _____, seconded by Director_____, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

_____
Chairperson

ATTEST:

_____
Secretary

ITEM 10

MEETING DATE: May 27, 2022

TITLE: Update on Safety Benefits of the Connector Project (Receive and File)

PREPARED BY: Matt Lampa

RECOMMENDATION

Receive an update on safety benefits related to the Connector project.

BACKGROUND

Staff has been working with Kittelson & Associates, Inc. ("Kittelson") to prepare a safety benefits analysis to quantify how the Connector project improves safety for all users. The analysis includes an evaluation of incidents along the 34-mile corridor, crash rates compared to other similar facilities, and Connector design elements that reduce collisions.

EXECUTIVE SUMMARY

Kittelson's analysis concludes that the Connector will implement various safety improvements that prove to reduce collisions based on research by the U.S. Department of Transportation and Caltrans. The three improvements that will provide the largest safety benefits on the Connector include a clear recovery area, access control, and a separated multi-use path.

The Connector project expects to reduce 216 crashes (a decrease of approximately 25%) over five years, based on existing traffic volumes, trends, and quantitative safety performance benefits calculated using crash reduction factors.

DISCUSSION

Kittelson collected data from state and local sources to form a database composed of five recent years of reported crashes (January 1, 2016, to December 31, 2020). Due to a lag in the availability of 2021 crash data, this data was not included. Over the five years reviewed, the corridor experienced 873 reported collisions, including six fatal and 34 serious injury incidents. While the data from 2021 is not yet available, three known fatalities occurred on the corridor in 2021.

The database was used to understand current safety performance along the corridor and

to estimate expected safety performance benefits with the implementation of the Connector project using crash reduction factor methodologies consistent with the AASHTO *Highway Safety Manual*.

The crash analysis identifies current common types, factors, and locations along the alignment. The top three crash types along the corridor are rear end (32%), hit object (run-off-road) (30%), and broadside (14%) crashes.

Three of the fatal crashes occurred on White Rock Road in the vicinity of the Segment currently being reconstructed and improved.

The highest number of crashes per mile was reported on Segment D2, Grant Line Road between Jackson Rd and White Rock Rd, followed by Segment B2.

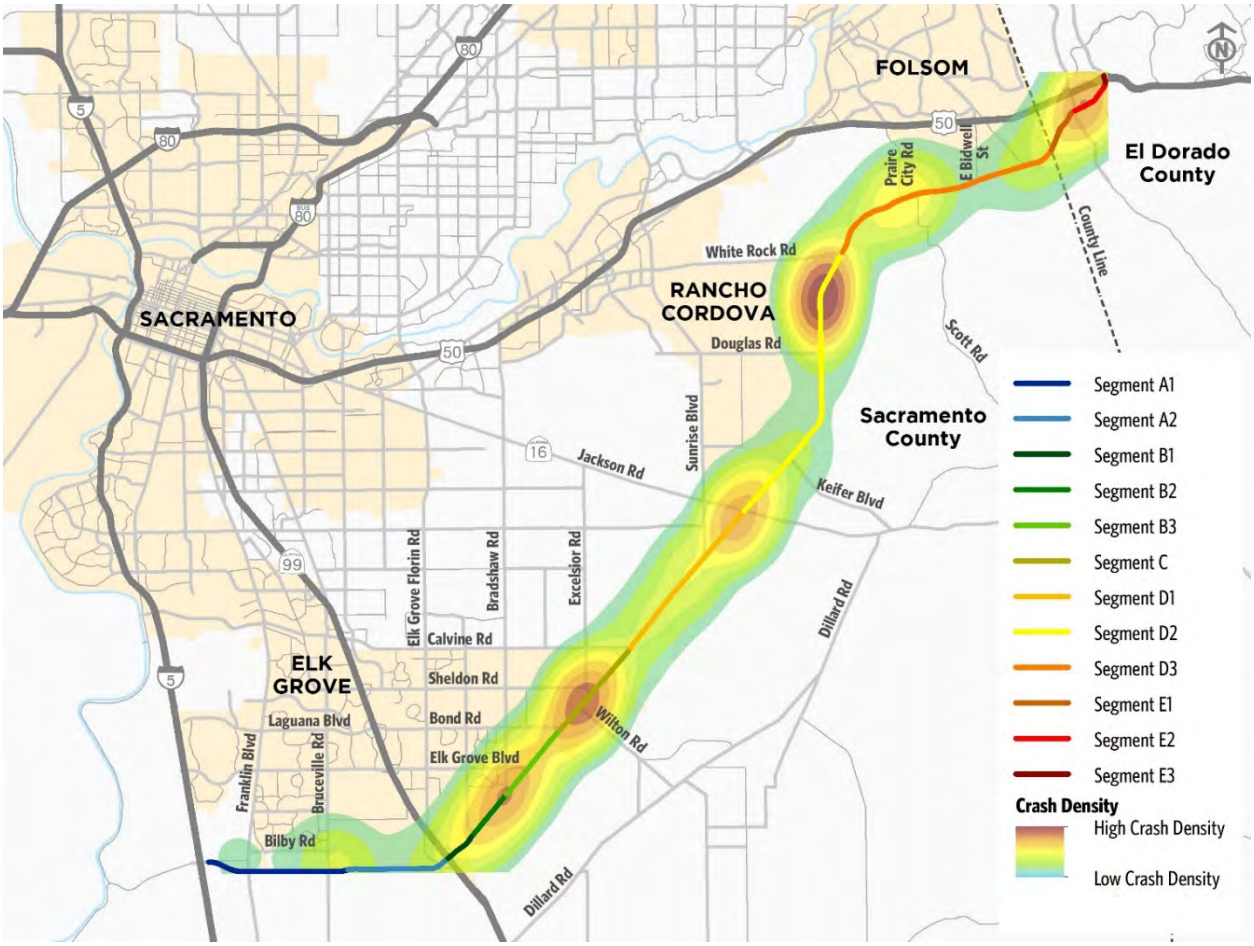


Figure 1: Crash Frequency Heat Map

The Connector Project includes a variety of elements aimed at improving safety along the corridor and at intersections. Eight elements of the project have been identified as providing safety performance benefits along the corridor including: access control, separated pedestrian and bicycle accommodations, medians, widened shoulders and recovery zones, improved roadway alignment, smart corridor elements, lighting, and intersection improvements.

SUMMARY

The Safety Analysis memorandum finds that investment in the construction of the Connector project would result in a significant expected reduction in crashes. The Connector would modernize the design of the existing alignment to current best practices in roadway design for safety and operations.

The improvements associated with the Connector are expected to reduce the number and severity of crashes (including reduced fatalities along the corridor), and provide a safer and more consistent roadway experience along the corridor.

ATTACHMENTS

a. Key Takeaways
b. Safety Benefit Analysis Memorandum, dated May 2022

ITEM 10 a

KEY TAKEAWAYS

SAFETY BENEFIT ANALYSIS

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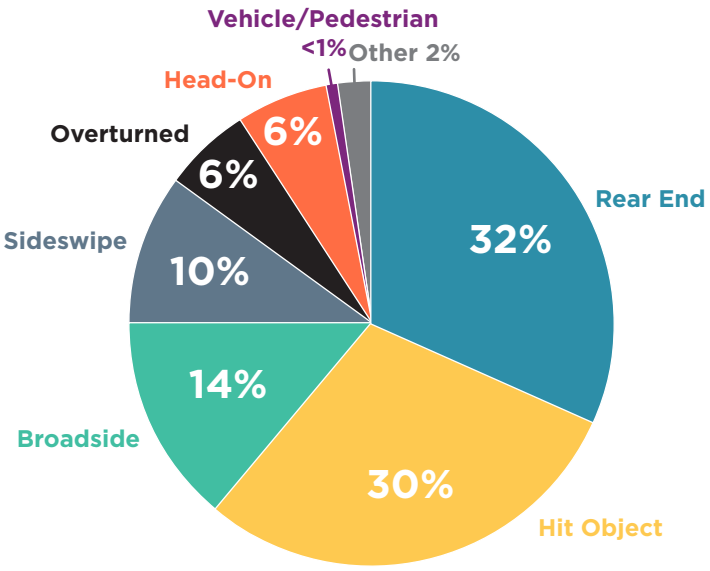
The Connector project specifically targets the crash types currently occurring on the corridor, transforming the existing roadway with narrow shoulders, roadside obstructions, inconsistent pedestrian and bicycle facilities, and substandard horizontal and vertical alignment into a modern four-lane multimodal facility. The Connector project presents the opportunity to utilize a **performance-based design approach** and bring the corridor up to the **latest design standards to improve safety**.

CRASHES BY COLLISION TYPE:



CRASHES BY YEAR AND SEVERITY:

Year	Fatal	Serious Injury	Other Injury	Property Damage Only	Total
2016	2	3	69	109	183
2017	2	5	73	116	196
2018	1	7	68	106	182
2019	1	11	74	89	175
2020	-	8	49	80	137
Total	6	34	333	500	873

3 SERIOUS INJURY PEDESTRIAN CRASHES

1 SERIOUS INJURY BICYCLE CRASH

FIXED OBJECT CRASHES: **4** FATAL, **12** SERIOUS INJURY, **75** OTHER INJURY

Crash data reflects reported crashes from the Statewide Integrated Traffic Records System (SWITRS) and provided by Sacramento County (referred to as Crossroads data) from January 1, 2016 through December 31, 2020. While the data from 2021 is not yet available, 3 known fatalities occurred on the corridor in 2021.

SAFETY IMPROVEMENTS TO ADDRESS CRASH HISTORY:

The corridor includes improvements directed at the crash patterns, including broadside, run off road/hit object, nighttime, and bicycle and pedestrian crashes.

- **Access Control**
- **Improved Roadway Alignment**
- **Separated Pedestrian and Bicycle Accommodations**
- **Smart Corridor Elements**
- **Landscaped Median**
- **Lighting**
- **Wider Shoulders and Clear Recovery Zones**
- **Intersection Improvements**

Providing "safe transportation options for all road users" is a key component of an **effective Vision Zero strategy** and the Federal Highway Administration's Safe System Approach. Improvements identified for the corridor respond to several of the **high priority challenge areas** in the **California Strategic Highway Safety Plan**, including lane departures, pedestrians and bicyclists, and intersections.

TOP THREE SAFETY BENEFITS INCLUDE:

1 PROVIDING **CLEAR RECOVERY AREA** TO ADDRESS RUN OFF THE ROAD CRASHES

2 **ACCESS CONTROL** TO REDUCE POTENTIAL CONFLICTS BETWEEN TURNING VEHICLES AND THROUGH MOVEMENTS

3 SEPARATING VULNERABLE ROAD USERS FROM VEHICLE TRAFFIC WITH **SHARED USE PATH**

EXPECTED REDUCTION OF **216 CRASHES (25%)** OVER 5 YEARS ON THE CORRIDOR THANKS TO THE CONNECTOR PROJECT

ITEM 10 b

KITTELSON & ASSOCIATES

2510 J Street, Suite 200
Sacramento, CA 95816
P 916.266.2190

MEMORANDUM: Safety Benefit Analysis

May 20, 2022 Project #: 27098

To: Matt Lampa, PE, Principal Civil Engineer
Capital SouthEast Connector JPA
10640 Mather Blvd., Suite 120
Mather, CA 95655

CC: Derek Minnema, PE, Executive Director

From: Matt Braughton, RSP; Kelly Laustsen; Grace Carsky; and Mike Aronson, PE; Kittelson & Associates, Inc.

RE: Connector Project Performance Benefits Study – Safety Benefit Analysis

Executive Summary

> The Connector Expressway will improve regional safety by converting two-lane rural roads into a modern four-lane multimodal facility.

This memorandum provides a summary of existing conditions along the roadways that make up the Capital SouthEast Connector (Connector) and expected safety benefits from the implementation of the Connector Project. Crash data reviewed for the most recent five years available (2016 through 2020) indicated the following:

- A total of 873 crashes were reported along the Connector, include **six fatal crashes** and **34 serious injury crashes**. While the data for 2021 is not yet available, two known fatalities occurred on the corridor in 2021.
- Predominant crash types on the corridor include **rear end, hit object,** and **broadside crashes**. Four of the six fatal crashes were fixed object crashes (three hit object crashes and one overturned crash).
- The existing crash rate is 1.2 crashes per million vehicle miles (MVM) over the corridor's 34-mile extent. Similar two- or three-lane expressway state facilities have a crash rate of 0.61 crashes per MVM. As such, **the current corridor exceeds the average crash rate for similar Caltrans facilities**.

The Connector project specifically targets the crash types currently occurring on the corridor, transforming the existing roadway with narrow shoulders, roadside obstructions, inconsistent pedestrian and bicycle facilities, and substandard horizontal and vertical alignment into a modern four-lane multimodal facility. The Connector will also be making improvements to grade separate existing rail crossings along the corridor to eliminate highway-rail conflicts. Key safety benefits included in the project include the provision of **clear recovery areas** to address run off the road crashes, **access control to reduce potential conflicts** between turning vehicles and through movements, and a **shared use path to separate vulnerable road users from vehicle traffic**. The Connector project is **expected to reduce crashes on the corridor by 25% (216 crashes)**, based on existing traffic volumes and crash trends. As a result, the Connector would provide a regional safety benefit, reducing overall crashes by 1% annually for the combined jurisdictions of Sacramento County, Elk Grove, and Folsom.

This memorandum includes the following sections:

- Project Background
- Crash Data Review and Summary
- Corridor Safety Performance
- Segment Specific Factsheets

The following page summarizes the key takeaway from the Safety Benefit Analysis, including existing crash trends and safety improvements with the Connector project.

KEY TAKEAWAYS

SAFETY BENEFIT ANALYSIS

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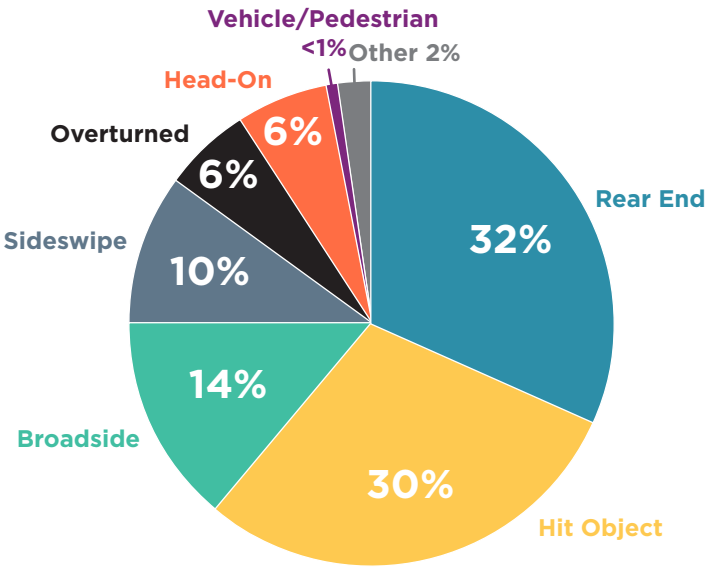
The Connector project specifically targets the crash types currently occurring on the corridor, transforming the existing roadway with narrow shoulders, roadside obstructions, inconsistent pedestrian and bicycle facilities, and substandard horizontal and vertical alignment into a modern four-lane multimodal facility. The Connector project presents the opportunity to utilize a **performance-based design approach** and bring the corridor up to the **latest design standards to improve safety**.

CRASHES BY COLLISION TYPE:



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FIXED OBJECT CRASHES: **4** FATAL, **12** SERIOUS INJURY, **75** OTHER INJURY

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SAFETY IMPROVEMENTS TO ADDRESS CRASH HISTORY:

The corridor includes improvements directed at the crash patterns, including broadside, run off road/hit object, nighttime, and bicycle and pedestrian crashes.

Access Control	**Improved Roadway Alignment**
Separated Pedestrian and Bicycle Accommodations	**Smart Corridor Elements**
Landscaped Median	**Lighting**
Wider Shoulders and Clear Recovery Zones	**Intersection Improvements**

Providing "safe transportation options for all road users" is a key component of an **effective Vision Zero strategy** and the Federal Highway Administration's Safe System Approach. Improvements identified for the corridor respond to several of the **high priority challenge areas** in the **California Strategic Highway Safety Plan**, including lane departures, pedestrians and bicyclists, and intersections.

TOP THREE SAFETY BENEFITS INCLUDE:

1 PROVIDING **CLEAR RECOVERY AREA** TO ADDRESS RUN OFF THE ROAD CRASHES

2 **ACCESS CONTROL** TO REDUCE POTENTIAL CONFLICTS BETWEEN TURNING VEHICLES AND THROUGH MOVEMENTS

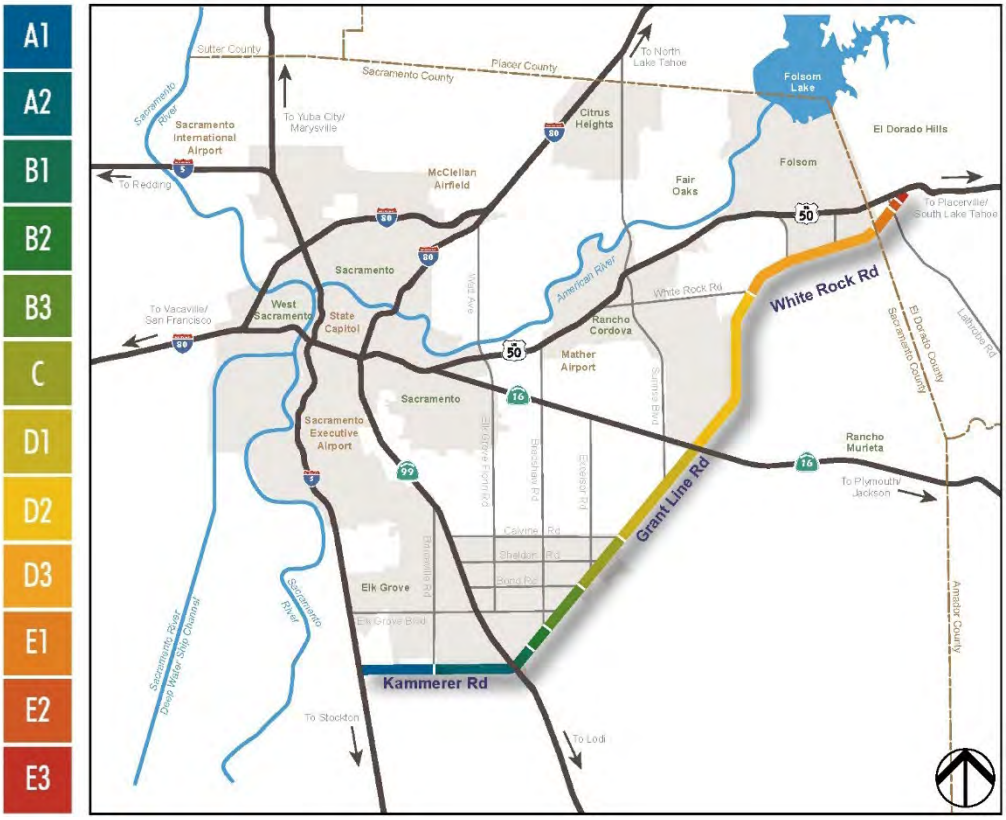
3 SEPARATING VULNERABLE ROAD USERS FROM VEHICLE TRAFFIC WITH **SHARED USE PATH**

EXPECTED REDUCTION OF **216 CRASHES (25%)** OVER 5 YEARS ON THE CORRIDOR THANKS TO THE CONNECTOR PROJECT

Project Background

The Connector is a 34-mile roadway linking Interstate 5 (I-5) to US Highway 50 (US 50) southeast of Sacramento. While the Connector includes some new sections of roadway, the majority of the Connector is existing roadways which will be upgraded as part of the overall project. The ultimate Connector design includes four to six travel lanes, a separated multi-use path, landscape median, and limited access points. Existing roadways that make up the Connector include Kammerer Road, Grant Line Road, and White Rock Road. The Connector is divided into five major segments, A through E, which are each relatively homogenous in design and character. Portions of the Connector roadway are complete, including segments B1, B2, and E3. Interim construction is also complete on segment A2.

Figure 1. Connector Segments



Crash Data Review

In order to better understand the impact of the Connector Project, existing safety conditions on the corridor were reviewed. This section describes the crash data reviewed and key trends and patterns.

CRASH DATABASE

The crash database used for this analysis is composed of the most recent five years of reported collisions, representing January 1, 2016 through December 31, 2020. Crash data was pulled from the Statewide Integrated Traffic Records System (SWITRS) and requested from Sacramento County (referred to as Crossroads data as the County uses a software program called Crossroads). The majority of the SWITRS and Crossroads data reflected the same crashes, but each contained some unique crashes. The full compilation was used for this analysis to reflect the most complete database of crashes reported to law enforcement. Some crash events are unreported to law enforcement or are not reported to the crash databases due to the minimal property damage

resulting from the crash. Crashes were included in the database if they occurred along the Connector or on intersecting roadways within 250 feet of the Connector, or if they occurred on the parallel routes to segment A1 of the Connector, since this portion of the Connector is largely unbuilt.

Collision severity is coded according to the highest degree of injury experienced, and the data used for this analysis includes the following coded severity levels (listed in descending order):

- **Fatal:** death because of injuries sustained in the collision.
- **Serious Injury:** Injuries include, for example, broken bones, severe lacerations, or other injuries that go beyond the reporting officer's assessment of "other visible injuries."
- **Moderate Injury (referred to as "other visible injury"):** an injury, other than those described above, that is evident to observers at the scene of the collision—for example, bruises or minor lacerations.
- **Minor Injury (referred to as "complaint of pain"):** internal or other non-visible injuries—for example, a person limps or seems incoherent.
- **Property damage only (PDO):** no injuries sustained.

For simplicity in presentation, moderate injury and minor injury collisions are frequently combined into a single "other injury" category.

CRASH SEVERITY AND USER

Table 1 shows crashes along the Connector Project by crash severity and road user type. Over the five-year period reviewed, a total of 873 crashes were reported on the corridor, including six fatal crashes and 34 serious injury crashes

Table 1. Crashes by User and Severity

Road User Type	Severity				
	Fatal	Serious Injury	Other Injury	Property Damage Only	Total
Bicycle-Involved	-	1	2	-	**3**
Pedestrian-Involved	-	3	1	-	**4**
Vehicle-Vehicle or Vehicle-Only	6	30	330	500	**866**
Total	**6**	**34**	**333**	**500**	**873**

Source: SWITRS and Crossroads data from January 1, 2016 through December 31, 2020

As shown in the table, there were four crashes that involved a pedestrian and three that involved a bicycle along the corridor between 2016 and 2020.

- Three of the four pedestrian crashes resulted in serious injuries. All four crashes occurred at night (two in areas without streetlights, two in an area with streetlights). One was recorded as pedestrian crossing not in crosswalk, two as pedestrian in road or shoulder, and one as pedestrian not in road.

- The three bicycle crashes resulted in some form of injury (one crash resulted in a serious injury and two resulted in minor injuries). Two of the bicycle crashes occurred during the daytime, including the crash that resulted in a serious injury; the third crash occurred at night in an area with streetlights.
- Of the six fatal crashes, four were reported as fixed object crashes, one as a broadside crash, and one as a head-on crash. Three of the six fatal crashes occurred in the vicinity of the White Rock Road/Prairie City Road intersection. Two of the crashes noted alcohol or drugs as a primary contributing factor.
- Ten of 34 serious injury crashes were reported as fixed object crashes and nine as broadside crashes. Seven occurred on Segment C and twelve on Segment D.

The most recent data available includes crashes reported between January 1, 2016 and December 31, 2020. At least two fatal crashes have occurred on the corridor since the beginning of 2021 resulting in three fatalities. These include a motorcycle crash near the intersection of Grant Line Road/Calvine Road (Segment C) and a crash near the intersection of Grant Line Road/Raymer Way (Segment D2).

LOCATION

Table 2 lists the crashes by location and severity, with intersection and segment crashes differentiated. Most fatal and serious injury crashes are segment crashes. Three of the fatal crashes occurred on Segment D3 in the vicinity of the intersection of White Rock Road and Prairie City Road. The highest number of segment crashes per mile was reported on Segment D2, followed by Segment B2.

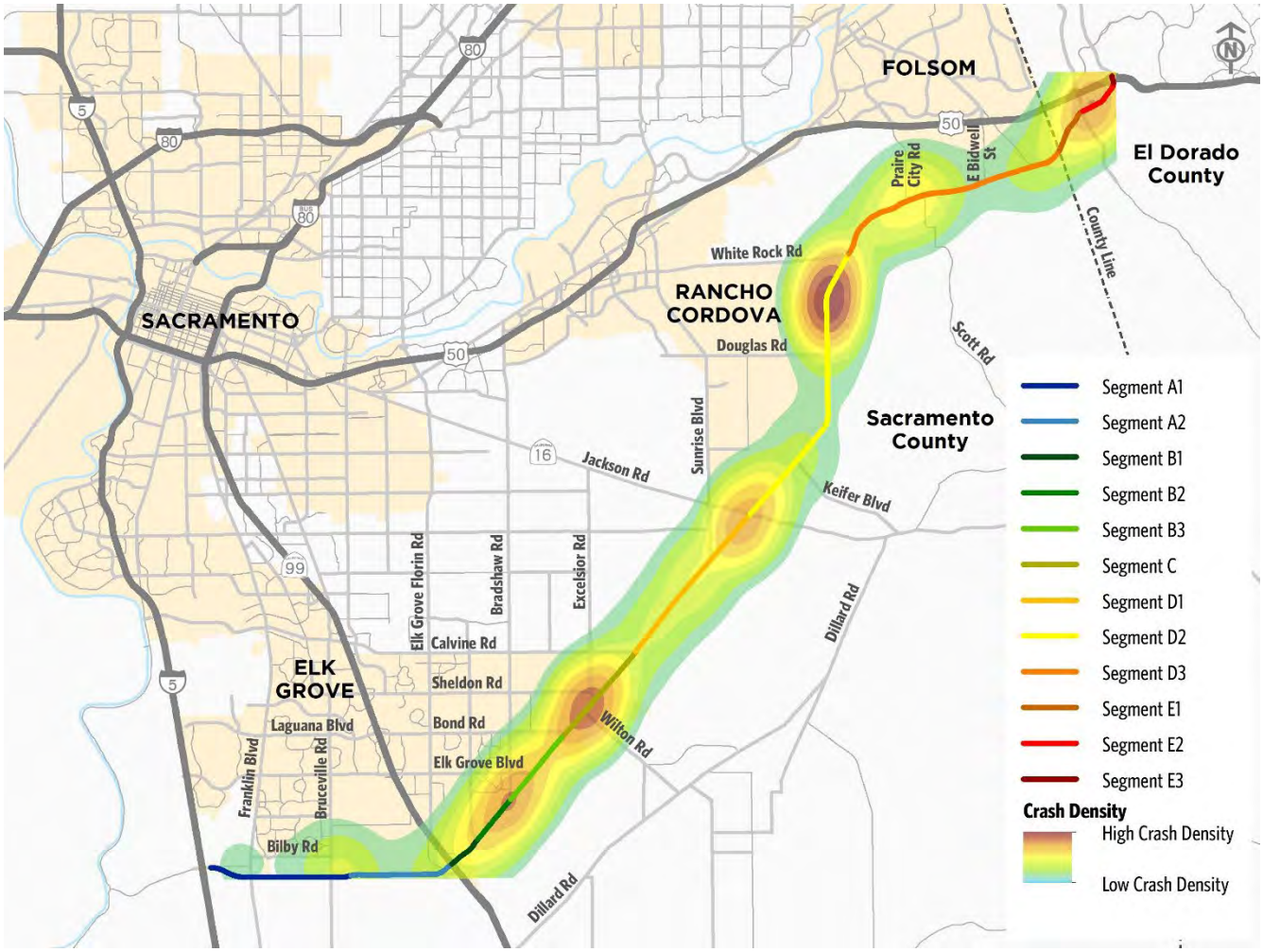
Table 2. Crashes by Location and Severity

Segment	Length (miles)	Crashes by Severity (Intersection | Segment)										Crashes per Mile (Int | Seg)	
		Fatal		Serious Injury		Other Injury		Property Damage Only		Total			
A1	3.6	-	-	3	-	13	4	16	10	32	14	8.9	3.9
A2	2.6	-	-	2	2	8	9	12	7	22	18	8.5	6.9
B1	0.9	-	-	-	-	4	2	14	1	18	3	20.0	3.3
B2	1.3	-	1	1	1	24	6	24	12	49	20	37.7	15.4
B3	2.1	-	-	1	-	19	3	17	8	37	11	17.6	5.2
C	2.7	-	-	5	2	57	4	42	7	104	13	38.5	4.8
D1	4.5	-	-	4	2	32	26	49	28	85	56	18.9	12.4
D2	7.4	1	-	4	1	12	31	25	95	42	127	5.7	17.2
D3	6.2	1	2	1	3	16	31	27	42	45	78	7.3	12.6
E1	1.3	1	-	-	-	2	2	5	5	8	7	6.2	5.4
E2	0.9	-	-	1	1	21	-	40	4	62	5	68.9	5.6
E3	0.2	-	-	-	-	7	-	10	-	17	-	85.0	-
Total	**33.7**	**3**	**3**	**22**	**12**	**215**	**118**	**281**	**219**	**521**	**352**	**15.5**	**10.4**

Source: SWITRS and Crossroads data from January 1, 2016 through December 31, 2020

The crash data is mapped by segment in each of the fact sheets at the end of this memorandum. Figure 2 provides a heat map illustrating the relative frequency of reported crashes along the corridor. The darker areas along the corridor indicate portions of the existing roadways with higher frequency of crashes along the future Connector alignment. Note that the darker areas do not necessarily indicate the locations of higher severity crashes.

Figure 2. Crash Frequency Heat Map for JPA Connector



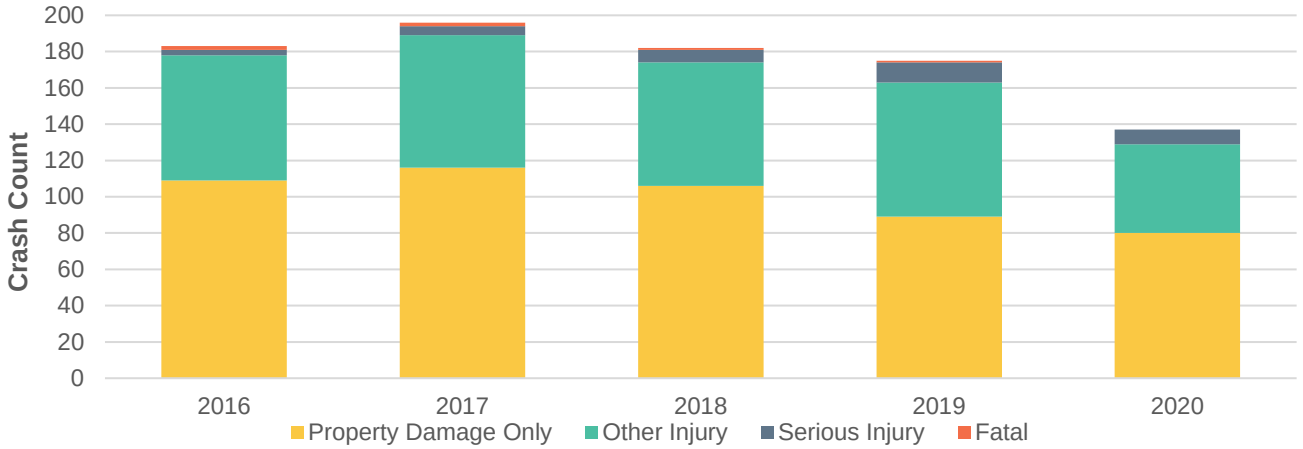
Source: SWITRS and Crossroads data from January 1, 2016 through December 31, 2020

As shown in Figure 2, the highest intensity of crashes along the Connector is at the horizontal curve located between Douglas Road and White Rock Road on Segment D2. Other locations with higher frequencies of crashes include segment B2, C, D1, and E2.

TEMPORAL TRENDS

Figure 3 shows the annual distribution of the 873 crashes reported between 2016 and 2020 along the existing roadways that comprise the Connector. The lower number of crashes reported in 2020 is likely due to reduction in traffic volumes as a result of the COVID-19 pandemic, though a similar number of serious injury crashes occurred in 2020 as compared to 2016, 2017, and 2018.

Figure 3. Total Number of Crashes by Year and Severity

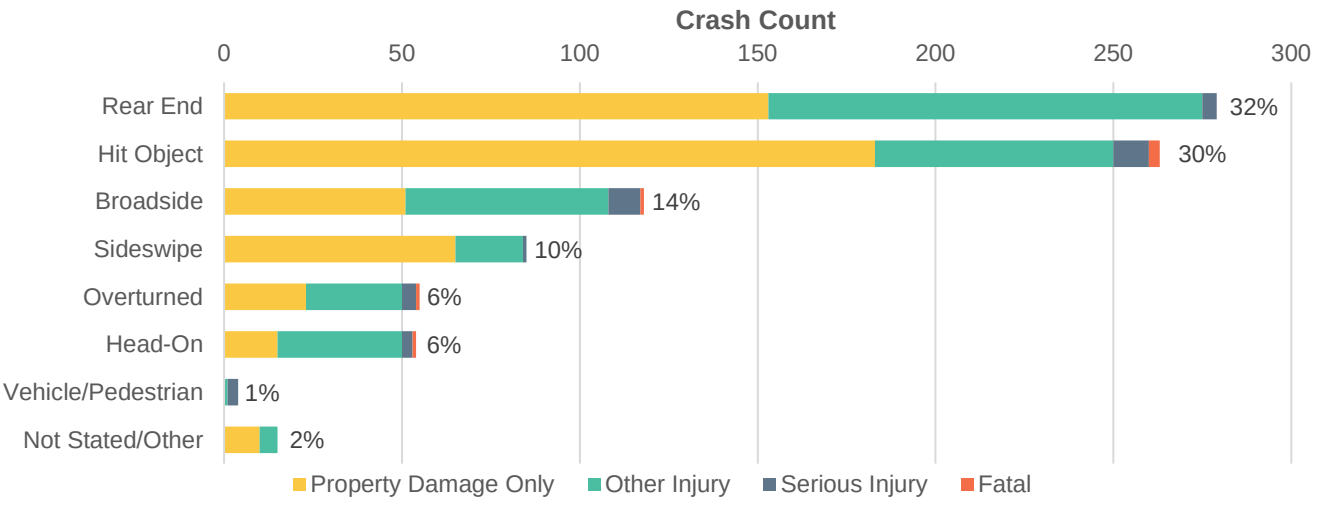


Source: SWITRS and Crossroads data from January 1, 2016 through December 31, 2020

Crashes were relatively evenly spread across the months of the year, with the most crashes occurring in October (10 percent of total crashes) and least crashes occurring in July (6 percent).

Figure 4 illustrates crashes by type and severity. The most frequent collision types on the corridor are rear end (32 percent), hit object (30 percent), and broadside (14 percent). The majority of the hit object crashes were classified as fixed object (238 of the 263 hit object crashes). Four of the six fatal crashes were fixed object crashes (three hit object crashes and one overturned crash). Ten of the 34 serious injury crashes were fixed object crashes.

Figure 4. Crashes by Collision Type and Severity

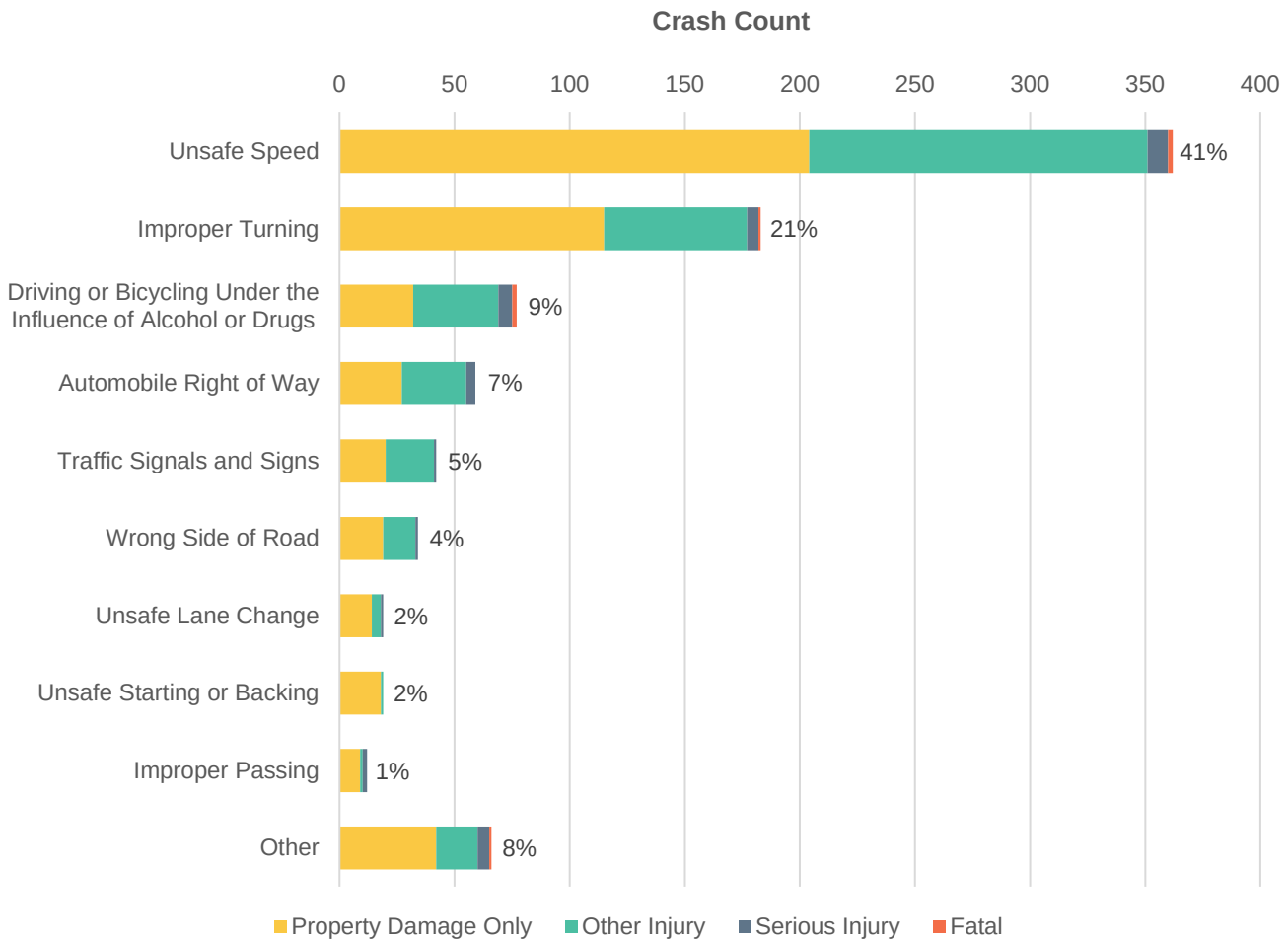


Note: The percentage shows the crash share for each crash type
Source: SWITRS and Crossroads data from January 1, 2016 through December 31, 2020

PRIMARY COLLISION FACTOR

As shown in Figure 5, the top reported primary collision factors were unsafe speed (41 percent of reported crashes), improper turning (21 percent), and driving or bicycling under the influence of alcohol or drugs (9 percent). The top primary collision factors among fatal and severe crashes are unsafe speed (two fatal and nine serious injury crashes) and driving or bicycle under the influence of alcohol or drugs (two fatal crashes and six serious injury crashes).

Figure 5. Crashes by Primary Collision Factor and Severity

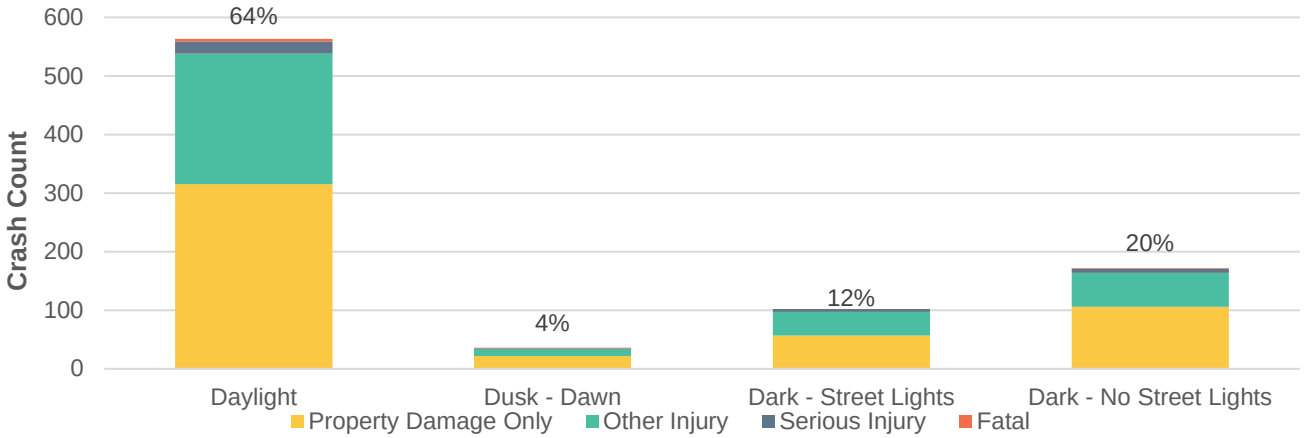


Note: The percentage shows the crash share for each primary collision factor
Source: SWITRS and Crossroads data from January 1, 2016 through December 31, 2020

LIGHTING

As shown in Figure 6, 64 percent of crashes occurred in the daytime and 32 percent occurred in dark conditions. Of the 32 percent of dark crashes, about two-thirds occurred in areas without streetlights. About a third of the crashes that occurred in dark conditions without streetlights were at intersections.

Figure 6. Crashes by Lighting Condition and Severity

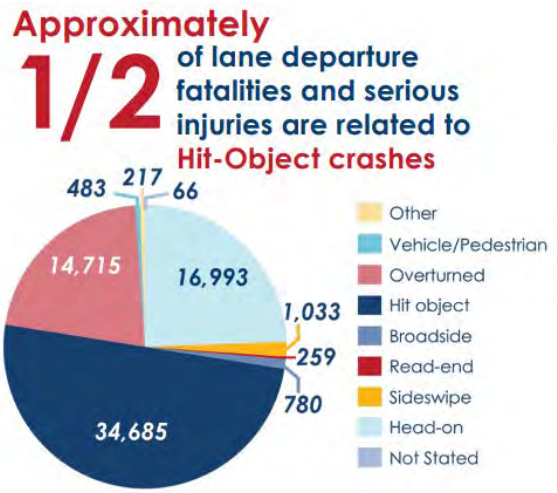


Note: The percentage shows the crash share for each lighting condition
Source: SWITRS and Crossroads data from January 1, 2016 through December 31, 2020

Crash Data Summary

The trends observed in the crash data review were compared to statewide trends, as reported as part of the California Strategic Highway Safety Plan (SHSP) in the September 2021 Traffic Safety Facts. Key similarities between the data include:

- Predominance of unsafe speed and impaired driving, especially in fatal and serious injury crashes. *Together, speed management/aggressive driving and impaired driving make up 62% of statewide fatalities and serious injuries.*
- High proportion of fixed object crashes, especially in fatal and serious injury crashes. *Lane departure crashes make up 45% of statewide fatalities and serious injuries, of which half are hit-object crashes.*
- High severity of pedestrian crashes. *25 percent of statewide fatalities are pedestrians.*



Source: California SHSP

Additionally, the existing corridor crash rate was compared to similar state facilities to understand the corridor's safety performance relative to other similar state facilities. Using 2019 traffic volumes from the County of Sacramento's Traffic Flow Map (Sacramento County Department of Transportation's Traffic Count Program, 2019), the existing Connector alignment has a crash rate of 1.2 crashes per million vehicle miles (MVM) over the corridor's 34-mile extent. Similar two- or three-lane expressway state facilities have a crash rate of 0.61 crashes per MVM (Caltrans *2018 Collision Data on California State Highways*). As such, the current corridor exceeds the average crash rate for similar Caltrans facilities.

As described in the following section, the improvements planned as part of the Connector Project address crash trends by providing a modern corridor with clear recovery zones, limited access points, and separate space for vulnerable road users.

Corridor Safety Performance

The Connector Project includes a variety of elements aimed at improving safety along the corridor and at intersections. Much of the current corridor was constructed over sixty years ago and is beyond its useful life. The roadways were designed to serve rural agriculture land uses and are not sufficient for current or projected vehicle volumes as the nearby established communities have grown and new developing community areas occur near or along the Connector Project. There are no existing facilities for pedestrians or bicyclists on most of the corridor. As sections of roadway are upgraded and intersections improved, the JPA is utilizing the latest design manuals and criteria which consider all users and current context-sensitive design practices. The design of the Connector seeks to maximize efficiency and safety for all modes.

> The Connector Project utilizes a **performance-based design** approach "in which key design decisions/criteria are made with consideration of their anticipated effects on project performance as relevant and practical to the project purpose and need. This analysis approach informs design decisions by quantifying impacts to safety and operational performance much in the way agencies quantify traffic growth, environmental impacts, traffic operations, pavement life, and construction cost."
>
> - Connector Project Design Guidelines

While the corridor cross section and intersection forms vary along the Connector, key elements of the project that are consistent across the corridor are discussed in the sections below.

ACCESS CONTROL

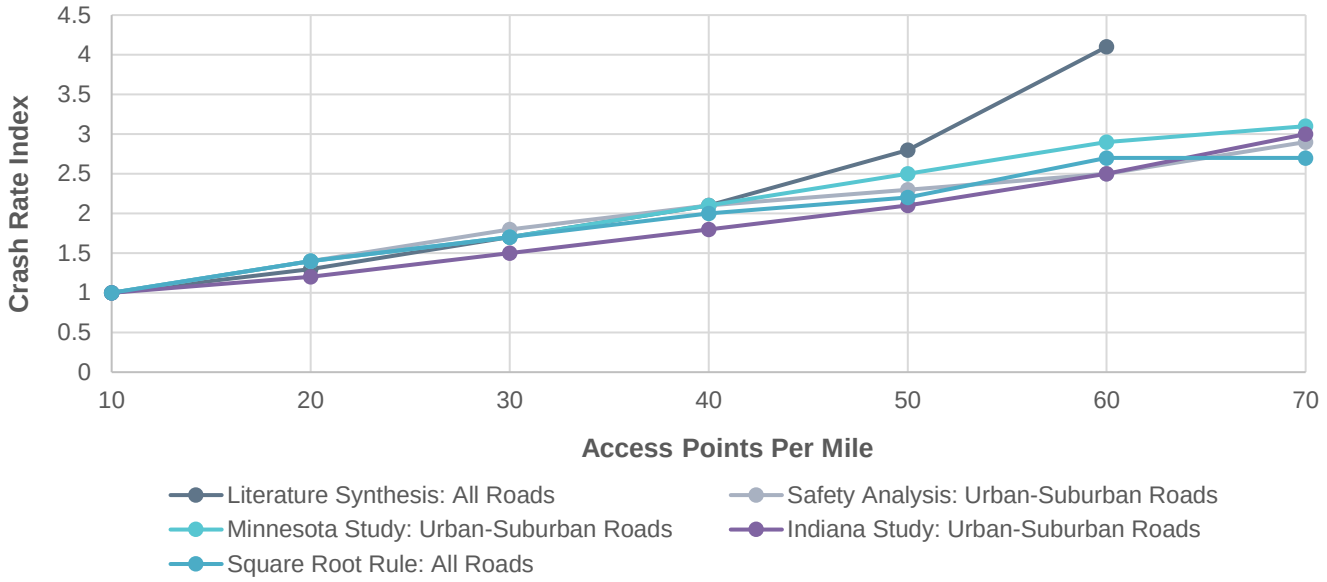
As noted in the Project Design Guidelines, "minimizing access points…reduces safety concerns for vehicular, bicycle, and pedestrian traffic." Along the corridor, the Connector seeks to consolidate and limit driveways and local road connections. In order to limit access in the long-term, the Functional Guidelines for the Connector includes the following:

> "To maximize the efficiency of the roadway, access to the Connector should be allowed only at a limited number of access points; principally, existing primary facilities and new facilities included in the MTP. Access should be limited to the greatest extent possible to retain efficiency, reduce congestion, and enhance mobility. New access to the Connector from areas not designated for growth in the general plans should not be permitted."
>
> - Connector Project Design Guidelines

The Project Design Guidelines include a section on right-of-way, which outlines the process for acquiring right-of-way for the connector to achieve the desired access management goals.

As noted in the Transportation Research Board (TRB) *Access Management Manual*, "research has documented the safety benefits of access management since the 1950s." Figure 7 summarizes data presented in the *Access Management Manual*, which illustrates the relationship between access point density and the rate of crashes. As noted in the manual, "as access density increases, crash rates increase."

Figure 7. Relationship between Access Points and Crash Rate



Source: TRB Access Management Manual

The benefits of limiting access points include:

- Reduction in conflicts between turning vehicles and through vehicles;
- Smaller speed differentials in traffic along the corridor, given vehicles are not slowing to turn off the corridor or accelerating after turning on the corridor;
- Fewer conflicts between vehicles and pedestrians and bicyclists given the physical separation of the shared-use path;
- Facilitates a divided roadway, where vehicles traveling in opposite directions are physically separated to reduce potential conflicts; and
- Reduction in driver workload, given locations for turning on and off the road are less frequent and clearly identified.

Corridor access management is one of Caltrans's **28 Proven Safety Countermeasures** that directly aligns with the first of Caltrans' **4 Pillars of Traffic Safety:**

SEPARATED PEDESTRIAN AND BICYCLE ACCOMMODATIONS

The Connector includes a multi-use path along most of the alignment, separated from the roadway by a vegetated buffer. In some areas, buffered bicycle lanes and sidewalks will instead be provided, given the context and proximity of adjacent development. The multi-use path will be connected to local and regional trails, as well as development adjacent to the corridor and transit facilities. Where spacing between intersections is greater than half a mile or where bicycle and pedestrian crossing demand is anticipated to be high, a protected crossing will be provided.

Proving "safe transportation options for all road users" is a key component of an **effective Vision Zero strategy and the FHWA Safe System Approach.**

Most of the current roadways that make up the Connector provide no shoulder or a minimal shoulder, presenting an unattractive environment for potential bicyclists or pedestrians along the corridor. Three of the four pedestrian crashes reported on the corridor resulted in serious injuries, comprising 9 percent of all serious injury crashes on the corridor. One of the three bicycle crashes resulted in serious injuries. The Connector Project provides a significant improvement in safety for pedestrians and bicyclists on the corridor and takes advantage of the opportunity to provide a high-quality, regional multi-use facility.

Local Roadway Safety: A Manual for California's Local Road Owners, includes sidewalks/pathways as a mitigation measure to address pedestrian and bicycle crashes, with an expected reduction in crashes of 80 percent.

LANDSCAPE MEDIAN

The Connector Project will provide a wide landscape median for the majority of the Connector's alignment, with a hardscape median used on the northeastern portion of the Connector. A median separates vehicles traveling opposite directions and facilitates access restrictions and turning restrictions. One of the six fatal crashes and three the 34 serious injury crashes reported on the corridor were head-on crashes.

WIDER SHOULDERS AND CLEAR RECOVERY ZONES

Much of the corridor has minimal to no shoulders, steep roadside ditches, and obstructions such as trees and utility poles close to the roadway. This is reflected in the crash types observed on the corridor, with hit object crashes the most common type. Fixed object crashes accounted for four of the six fatal crashes and ten of the 34 serious-injury crashes. In addition, based on information from the Sacramento Municipal Utility District (SMUD), there were 20 hits of SMUD utility poles along the Connector alignment between 2016 and 2020 and 51 hits over the last two decades, with an increase in frequency of pole hits over the past several years.

As part of the Connector project, utility poles will be relocated into a dedicated public utility easement outside the clear recovery zone, significantly increasing separation between vehicles and utility poles. This improvement reduces potential strikes to utility poles, improving safety and decreasing fire risk due to downed power lines.

The California Statewide Highway Safety Plan includes **lane departures** as one of its six high priority challenge areas. This includes head-on, hit object, and overturned crashes. High priority challenge areas represent the greatest opportunity to reduce fatalities and serious injuries across the state.

Local Roadway Safety: A Manual for California's Local Road Owners, was developed in April 2020 by Caltrans in conjunction with the Federal Highway Administration (FHWA) and the Berkeley Safe Transportation Research and Education Center (SafeTREC). It provides guidance on systemic safety improvements. The manual notes the following:

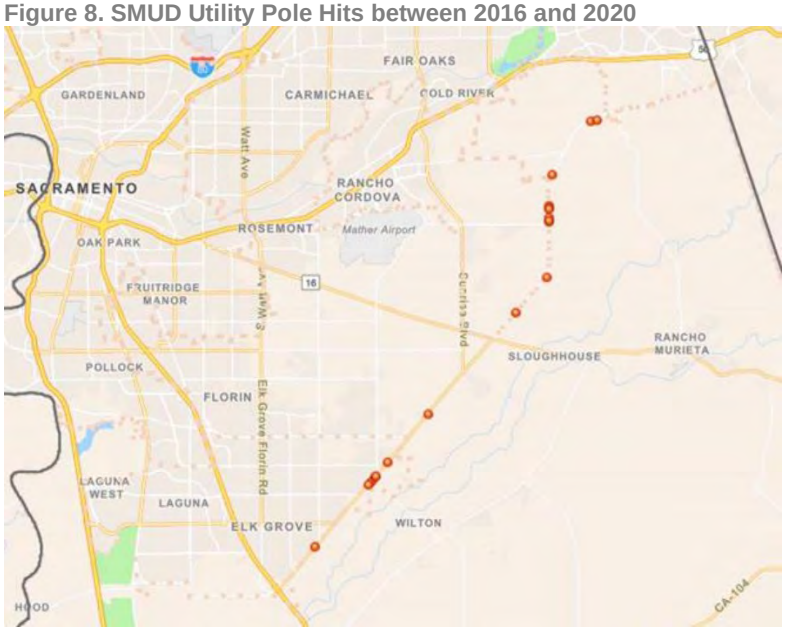
Medians address head-on crashes by creating a "buffer median between opposing lanes" and "providing a greater opportunity to correct an errant maneuver and further reinforce the limits of the travel lane" (page Appendix-33).

Wider shoulders increase the "probability of a safe recovery" and address fixed object, run-off road, and sideswipe crashes (page Appendix-36).

A "**clear recovery zone** should be developed on every roadway, as space is available… Removing or moving fixed objects… reduces the likelihood of a crash" (page Appendix-29).

Landscape medians and wider shoulders and clear recovery zones directly address lane departures along the Connector Project.

Figure 8. SMUD Utility Pole Hits between 2016 and 2020



Source: SMUD

Local Roadway Safety: A Manual for California's Local Road Owners, includes shoulder widening as a mitigation measure to address fixed object and run-off-the-road crashes, noting that "based on the best available research, adding shoulder or widening an existing shoulder provides a greater area to regain control of a vehicle, as well as lateral clearance to roadside objects such as guardrail, signs and poles" (page Appendix-36). The Manual indicates that widening shoulders can reduce crashes related to the shoulder or clear zone by 30 percent.

IMPROVED ROADWAY ALIGNMENT

Much of the Connector Project utilizes existing roadways, including Kammerer Road, Grant Line Road, and White Rock Road. Where the existing roadways have substandard horizontal and vertical curves, a new roadway alignment will be constructed as close to the existing alignment as possible. Short vertical and horizontal curves contribute to limited decision and stopping sight distance. These curves may also contribute to run-off-the-road fixed object collisions along the corridor.

Figure 9. Typical Expressway Cross Section

Source: Connector Project Design Guidelines

The additional travel lanes, landscape median, wider shoulders, clear recovery zone, and improved roadway alignment support envisioned speeds on the corridor, compared to the existing corridor, which was not designed for the speeds drivers expect to travel.

SMART CORRIDOR ELEMENTS

The Connector will be a Smart Corridor, implementing established intelligent transportation system (ITS) infrastructure and providing the opportunity to test emerging transportation technologies. In order to ensure that technology-related infrastructure is coordinated between member agencies and incorporated into final design efforts, the JPA developed a Smart Corridor Plan to identify foundational ITS infrastructure.

> "This Smart Corridor Plan includes the technology vision and goals of the corridor, recommends the foundational Intelligent Transportation System (ITS) infrastructure that will be programmed and implemented as part of the project, and establishes the Connector as a transportation facility well suited to accommodate, test, and promote a broad range of transportation technologies."
>
> - Smart Corridor Plan for the Connector, March 2019

Established ITS infrastructure includes backbone communications, vehicle detection, closed circuit television cameras, and changeable message signs. This infrastructure helps improve safety by:

- Enabling faster incident response times;
- Gathering more data on the corridor's performance that can help target improvements;
- Providing data to refine traffic signal timing to reduce red-light-running and congestion-related Incidents; and
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more.

The Connector will feature electric vehicle charging stations and connected vehicle infrastructure. It also presents opportunities to test automated vehicles, which have the potential to provide significant safety benefits.

The California Statewide Highway Safety Plan includes Emerging Technologies as one of its focus areas. "It includes exploring technology advancements that are new or underutilized and that can potentially reduce the frequency and severity of crashes. It is inclusive of autonomous and connected vehicles as well as advancements to safety devices in vehicles, improvements to emergency response, and any technologies helping the 5 Es, including the use of a Transportation Network Company (TNCs) for cars, bike or scooters."

LIGHTING

The Connector Project includes lighting at intersections, interchanges, and along the multi-use path. Smart street lighting will be used along the pathway, which can dim during nighttime hours when activity is expected to be low and revert back to full output when motion is detected. The *Local Roadway Safety Manual* notes that "Providing lighting at the intersection itself, or both at the intersection and on its approaches, improves the safety of an intersection during nighttime conditions by (1) making drivers more aware of the surroundings at an intersection, which improves drivers' perception-reaction times, (2) enhancing drivers' available sight distances, and (3) improving the visibility of non-motorists" (page Appendix-5). One of the six fatal crashes on the corridor occurred at an intersection in dark conditions with no lighting, as did four of the 34 serious injury crashes.

INTERSECTION IMPROVEMENTS

The Connector Project includes six new roundabouts and approximately nine new traffic signals, as well as upgrades to existing signalized intersections along the Connector. Traffic signals will be designed to maximize efficiency and safety, considering design features like turn lanes, storage lengths and tapers, signal hardware and timing, and ITS infrastructure. New ITS infrastructure at the intersections will enable closer tracking of performance and data-driven refinements to signal operations. The Connector will limit intersections to key intersecting roadways, with existing accesses consolidated or relocated where possible.

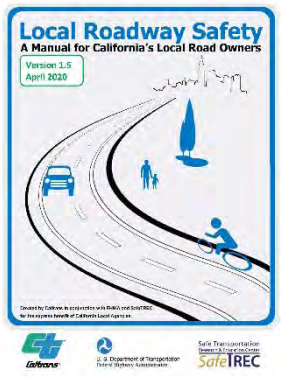
Where two-way stop-controlled intersections are provided along the corridor, turn lanes will typically be provided on the Connector to separate slower turning vehicles from through traffic.

Intersections are one of the six priority areas in the California SHSP. Proven countermeasures that will be implemented as part of the Connector Project to address intersection conflicts include:	
	Access management
	Left- and right-turn lanes at two-way stop-controlled intersections
	Roundabouts

RAIL CROSSING GRADE SEPARATIONS

As part of the Connector project implementation, existing rail crossings west of Waterman Road and at Old Placerville Road have been identified for grade separations or rail crossing enhancements. The rail crossing west of Waterman Road has been grade separated with a new overcrossing to completely separated multimodal traffic from the rail crossing (show at right). As noted in the FHWA *Highway-Rail Crossing Handbook, Third Edition*, grade separation is the "first alternative that should always be considered" to "provide the highest level of crossing safety." An additional rail undercrossing grade separation is planned at the Old Placerville Road rail crossing. These enhancements will eliminate future rail-related crashes along the corridor.

CORRIDOR, SEGMENT AND INTERSECTION TREATMENTS SAFETY PERFORMANCE



The California publication, *Local Roadway Safety: A Manual for California's Local Road Owners* (LRSM), and American Association of State Highway Officials (AASHTO) publication, *Highway Safety Manual* (HSM), both provide information on the quantitative impact of many of the treatments planned for the Connector.

Key terms used in both manuals include:

Crash Modification Factor (CMF): multiplicative factor to estimate the expected number of crashes after implementing a given countermeasure at a specific site. The lower the CMF, the greater the reduction in crashes expected. For example, a CMF of 0.2 for a treatment indicates that if ten crashes are currently occurring per year, with the treatment two crashes per year are expected.

Crash Reduction Factor (CRF): percentage of crashes the countermeasure is expected to reduce. The CRF is defined as 1 – CMF. The higher the CRF, the greater the reduction in crashes expected. For example, a CRF of 0.2 for a treatment indicates that if ten crashes are currently occurring per year, with the treatment eight crashes per year are expected (ten crashes minus two crashes).

Table 3 lists elements with available data to support the expected reduction in crashes.

Table 3. Safety Performance of Improvements Planned for Connector

Element	CRF[1]	Crashes Addressed[2]	Why it Works
Multi-use path	80%	Pedestrian and bicycle crashes	Provides separated space for pedestrians and bicyclists
Buffered bicycle lanes	45%	Pedestrian and bicycle crashes	Separated bicycle lanes provide increased safety and comfort for bicyclists due to additional space and barriers separating bicyclists from vehicles
Sidewalks	80%	Pedestrian and bicycle crashes	Reduces walking on the roadway and provides a physically separated space for pedestrians
Landscape or hardscape median	25%	Head-on crashes	Provides a buffer between opposing vehicles, reinforces the limits of the traveling lane, and limits turning movements
Shoulder widening	30%	Fixed object crashes Sideswipe crashes	Provides a greater area to regain control of a vehicle and avoid fixed objects
Clear recovery zone	35%	Fixed object crashes	Allows drivers to safely stop and regain control of the vehicle, reducing likelihood of a crash
Reduce vertical curvature	25%	Crashes within influence area of curvature	Improves sight distance
Reduce horizontal curvature	50%	Crashes within influence area of curvature	Reduces likelihood of a vehicle leaving its lane or the roadway

Element	CRF[1]	Crashes Addressed[2]	Why it Works
Lighting	Segment: 35% Intersection: 40%	Nighttime crashes	Improves perception-reaction times and sight distance
Traffic signal	30%	Intersection crashes	Traffic signals have the potential to reduce the most severe type crashes but will likely cause an increase in rear-end collisions
Raised median on intersection approaches	25%	Crashes on approaches to traffic signals	Reinforces the separation between turning vehicles and oncoming vehicles and prohibits left turns into and out of accesses near the intersection
Roundabout	Existing signal: 67%[3] Existing two-way stop-control: 19%[3]	Intersection crashes	Reduces speeds and removes conflicts from crossing and left-turn movements
Reduce intersection skew	Varies	Intersection crashes	Increases sight distance

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
3 Converting a traffic signal to a roundabout, from the Highway Safety Manual

When quantifying the overall expected changes in crashes with the implementation of multiple treatments, both the *LRSM* and *HSM* suggest the benefits are multiplicative, meaning the crash modification factors may be multiplied to estimate a combined effect. The *LRSM* and *HSM* guidance caution that the combined effect of multiple treatments may be overestimated when multiplying several crash modification factors, and suggest that only up to three countermeasures should be included in an assessment when considering combined safety performance changes. This is because while the crash modification factors for the treatments are assumed to have independent effects, there could be some redundancy between the effects of multiple treatments. This means that the net benefit is less than what would be calculated by summing the impact of each independent improvement. As an example, the calculation to determine the estimate of reduction in crashes with the Connector Project for Segment B3 is shown below.

Treatments included:

1. Landscape median: 0.75 CMF for head-on crashes
2. Shoulder widening: 0.7 CMF for fixed object and sideswipe crashes
3. Clear recovery zone (CRZ) widening: 0.65 CMF for fixed object crashes
4. Multi-use path: 0.2 CMF for pedestrian and bicycle crashes
5. Install traffic signal at Elk Grove Boulevard: 0.7 intersection crashes
6. Intersection lighting: 0.6 CMF for intersection crashes under dark conditions with no lighting

Table 4. Segment B3 Example: Reduction in Crashes with Connector Project

Crash Category	# of Crashes	Applicable Treatments CMF (see list above)						Expected Crashes	
		1	2	3	4	5	6	All Treatments	Treatments 2, 3, & 5
Head-on crashes	2	0.75						2 x 0.75 = 1.5	2
Fixed-object crashes	5		**0.7**	**0.65**				5 x 0.7 x 0.65 = 2.3	5 x 0.7 x 0.65 = 2.3
Sideswipe crashes	3		**0.7**					3 x 0.7 = 2.1	3 x 0.7 = 2.1
Pedestrian/bicycle crashes	1				**0.2**			1 x 0.2 = 0.2	1
Elk Grove Boulevard intersection crashes (not in dark conditions with no lighting)	28					**0.7**		28 x 0.7 = 19.6	28 x 0.7 = 19.6
Elk Grove Boulevard intersection crashes (dark conditions with no lighting)	1					**0.7**	0.6	1 x 0.7 x 0.6 = 0.4	1 x 0.7 = 0.7
Total	**40**							**26.1**	**27.7**

As shown in Table 4, considering all six applicable treatments results in 26.1 expected crashes, for a reduction of 14 crashes (40-26.1). Using the methodology in the *LRSM* and *HSM*, up to three treatments should be considered at once. Considering treatments #2 (shoulder widening), #3 (clear recovery zone), and #5 (traffic signal at Elk Grove Boulevard) results in 27.6 expected crashes, for a reduction of 12 crashes (40-27.7). This analysis does not suggest that the other treatments should not be implemented or are not likely to improve safety performance on the corridor. In order to be consistent with guidance in the *LRSM* and *HSM*, the assessment done for the Connector Project accounts for crash reductions associated with three or less countermeasures when calculating the overall segment or corridor potential crash reduction. Therefore, the total potential crash reduction shown for each segment on the following fact sheets is lower than the sum of the potential crash reductions for each element. As an example, the portion of the fact sheet for Segment B3 showing the planned safety improvements is provided in Figure 10. Summing the potential crash reductions for each elements indicates a reduction in over 15 crashes, while a total potential reduction of 12 crashes is indicated when only three treatments are considered. However, the potential safety benefits of each treatment applicable to each segment where quantitative safety benefits are known is provided to document known quantitative benefits associated with each element of the safety improvements associated with the Connector.

Figure 10. Planned Safety Improvements Table Segment B3

ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
Landscape median	36' wide landscaped median	25% - Crashes within limits of new median	2 head-on crashes	1 crash
Shoulder widening	5' inner shoulders, 10' outer shoulders	30% - Crashes within limits of new paved shoulder	5 fixed object crashes 3 sideswipe crashes	2 crashes
Clear recovery zone	20' feet or more of drainage swale/vegetated buffer	35% - Crashes in new clear recovery zone	5 fixed object crashes	2 crashes
Multi-use path	10-12' multi-use path separated from roadway	80% - Pedestrian and bicycle crashes	1 bicycle crash	1 crash
Install traffic signal	Grant Line Road/Elk Grove Boulevard	30% - Intersection crashes	29 crashes	9 crashes
Lighting	Lighting at interchanges and intersections	40% - Night crashes at intersections	1 intersection crash in dark conditions with no street lights	<1 crash

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
**Potential crash reductions is over 5 year period*

TOTAL POTENTIAL REDUCTION OVER 5 YEARS =**12 CRASHES**

(BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.)

Segment Specific and Corridor Safety Performance

Appendix A provides factsheets with crash summaries and planned safety improvements specific to each segment of the Corridor. Segment fact sheets are not included for Segments B1 or E3, given that these segments of the Connector were completed prior to or during the analysis period. Each factsheet summarizes the expected crash reduction associated with implementation of the Connector. These expected crash reductions and the treatments used to calculate the benefit for each segment and the Connector corridor are show in Table 1. The individual crash reduction calculations for each CRF are shown on each segments factsheet.

Combined the segments would results in an expected overall reduction of 216 crashes, or 25% decrease over a similar five-year period, or approximately 43 crashes annually. Considering this reduction, the Connector project alone could account for a 1% decrease in annual crashes for the subregion including Sacramento County, Elk Grove, and Folsom.

Table 1: Crash Reductions by Segment Summary

Segment	Calculation Treatments	Crash Reduction
A1	Intersection Improvements	6
A2	Shoulder Widening Clear Recovery Zone Widening Install Median	11
B2	Clear Recovery Zone Widening Install Traffic Signals Install Lighting	15
B3	Shoulder Widening Clear Recovery Zone Widening Install Traffic Signals	11
C	Clear Recovery Zone Widening Roundabouts (from Signal) Roundabouts (from Two-Way Stop Control)	41
D1	Install Median Clear Recovery Zone Widening Install Lighting	15
D2	Shoulder Widening Clear Recovery Zone Widening Improve Horizonal Curves	66
D3	Shoulder Widening Clear Recovery Zone Widening Improve Horizonal Curves	38
E1	Install Median Shoulder Widening Clear Recovery Zone Widening	3
E2	Install Median Install Sidewalk	12
Total		**216**

Conclusion

As documented through this memorandum, the Connector project provides significant safety benefits for the corridor, transforming the existing roadway with narrow shoulders, roadside obstructions, inconsistent pedestrian and bicycle facilities, and substandard horizontal and vertical alignment into a modern four-lane multimodal facility. The Connector project presents the opportunity to utilize a performance-based design approach and bring the corridor up to the latest design standards to improve safety. The project is consistent with statewide and national safety practices. For example, improvements identified for the corridor respond to several of the high priority challenge areas in the California Strategic Highway Safety Plan, including lane departures, pedestrians and bicyclists, and intersections. Providing “safe transportation options for all road users” is a key component of an effective Vision Zero strategy and the Federal Highway Administration’s Safe System Approach. The Connector project is expected to reduce crashes on the corridor by 25%, based on existing traffic volumes and crash trends.

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Appendix A. Segment Fact Sheets

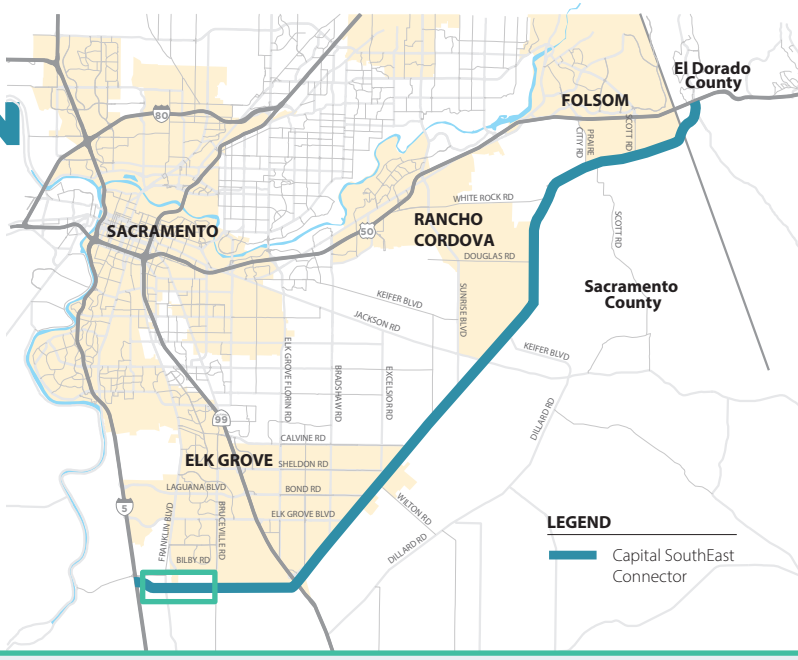
A1: I-5/HOOD FRANKLIN ROAD INTERCHANGE TO BRUCEVILLE ROAD

LENGTH: 3.6 miles

JURISDICTION: City of Elk Grove and Sacramento County

INTENT: Provide a modern expressway with access control and railroad grade separation

STATUS: NEPA and preliminary engineering in progress



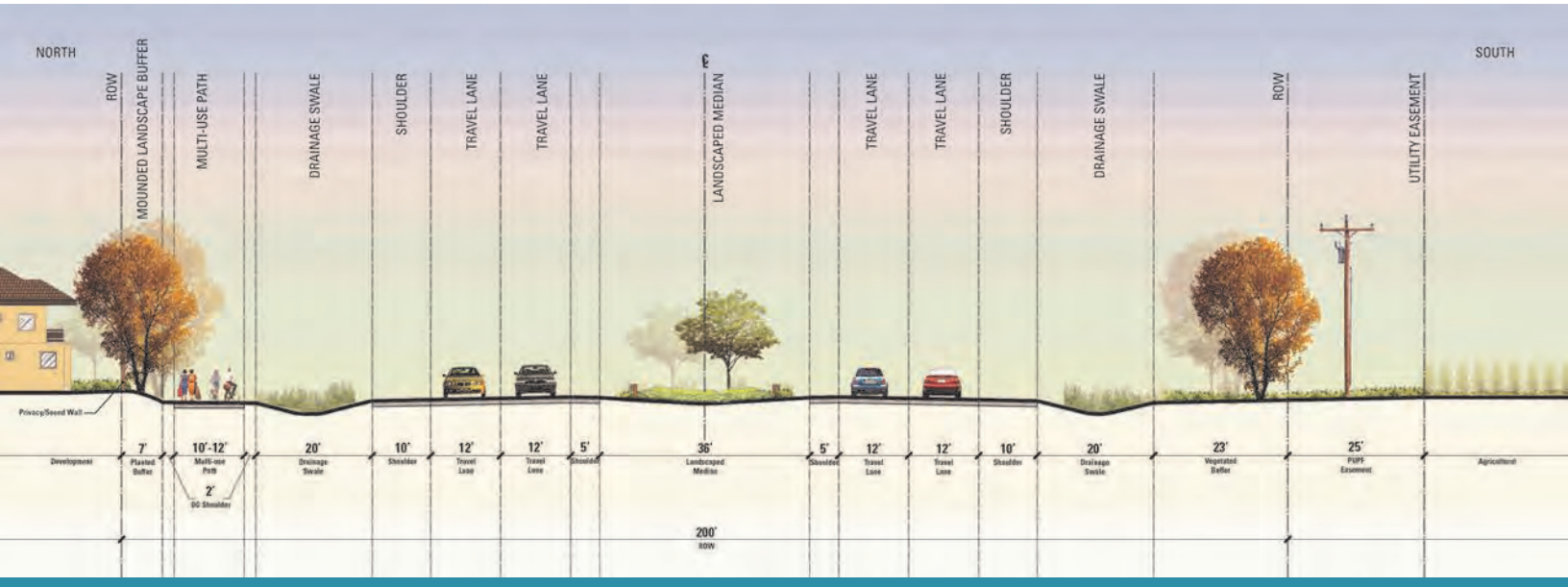
EXISTING CORRIDOR INCLUDES:

- Three signalized intersections
- Full access at residential driveways and cross-street connections along the corridor
- Utility poles immediately adjacent to the roadway
- West of Lent Ranch Parkway: two travel lanes with minimal to no shoulders
- East of Lent Rach Parkway: six travel lanes, bike lanes, partial sidewalks

FUTURE CORRIDOR INCLUDES:

- New Connector Roadway between Hood Franklin Road (just east of I-5) and Kammerer Road
- Traffic signals at Hood Franklin Road/I-5 Northbound Ramps, new Connector Roadway/Franklin Boulevard, and new Connector Roadway-Kammerer Road/ Bruceville Road
- Grade-separated railroad crossing
- Limited access points
- Separated multi-use path
- Four travel lanes, wider shoulders, landscape median
- Smart Corridor elements
- Roadway lighting at intersections

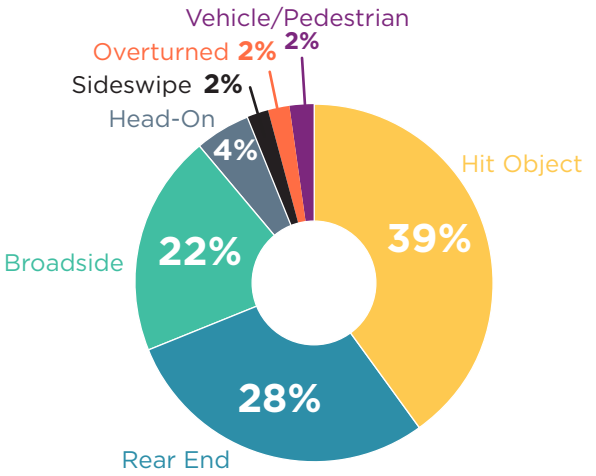
FUTURE CROSS SECTION:



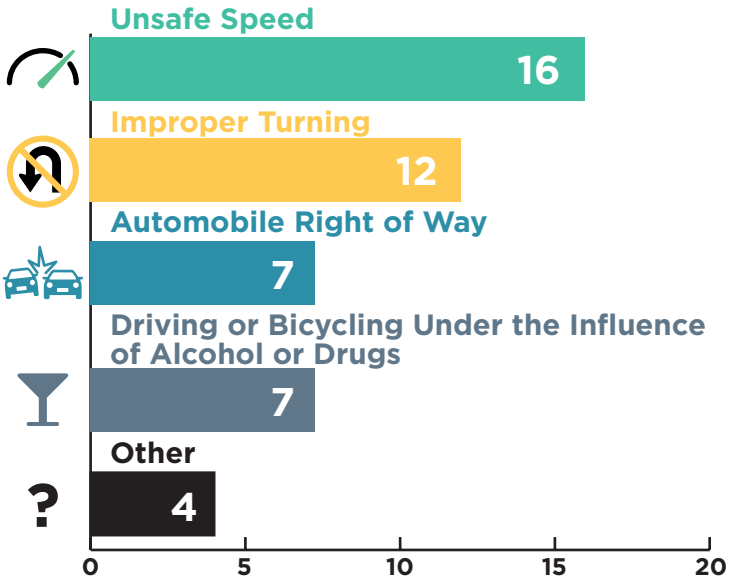
CRASH DATA SUMMARY

A1: I-5/HOOD FRANKLIN ROAD
INTERCHANGE TO BRUCEVILLE ROAD

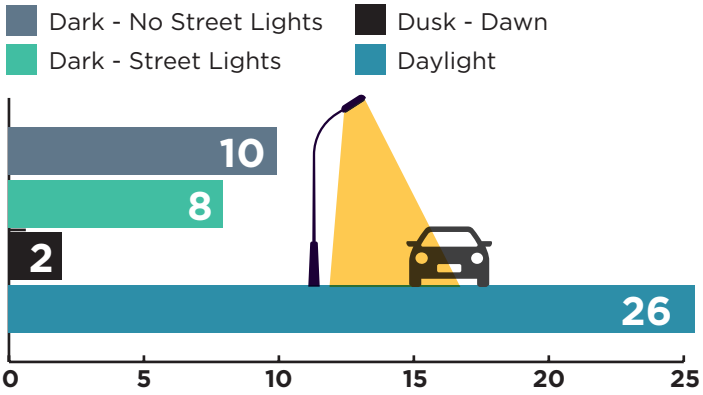
CRASH TYPE



CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

14 SEGMENT CRASHES

32 INTERSECTION CRASHES

CRASHES BY YEAR AND SEVERITY

Year	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	-	5	4	9
2017	3	4	8	15
2018	-	2	6	8
2019	-	3	6	9
2020	-	3	2	5
Total	3	17	26	46

OTHER STATS TO HIGHLIGHT

3 SERIOUS INJURY CRASHES

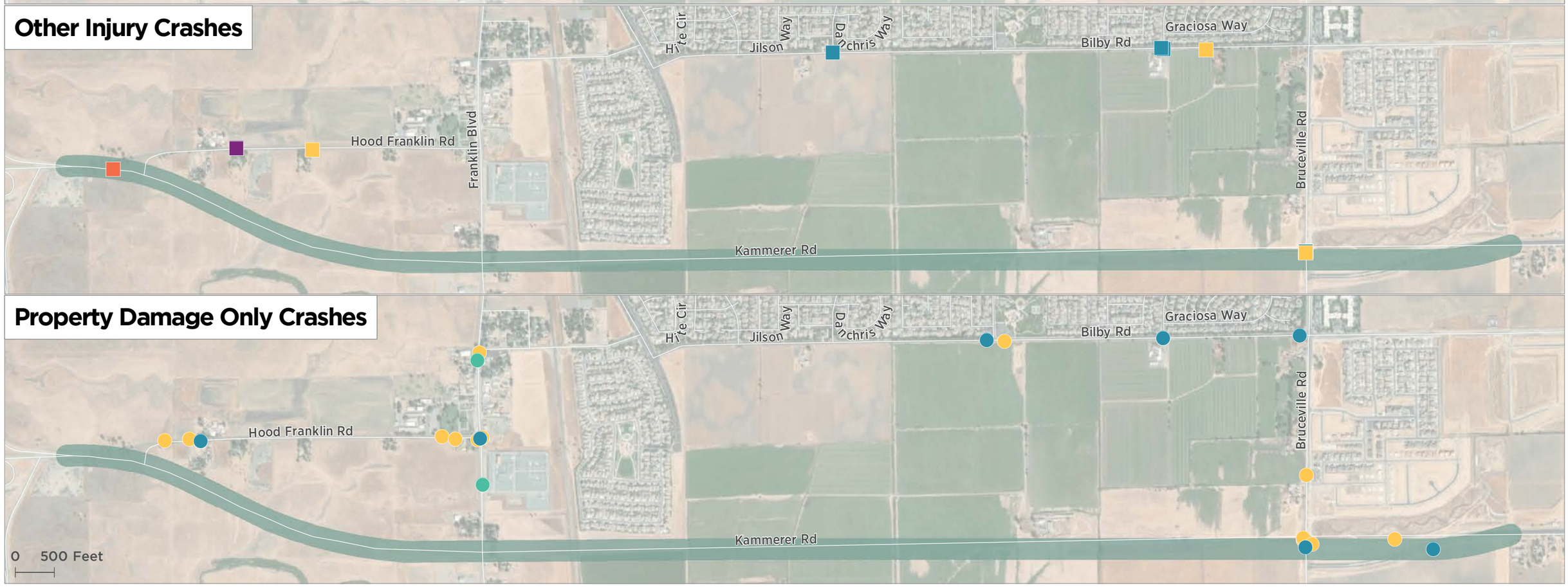
1 PEDESTRIAN CRASH (OTHER INJURY)

46 TOTAL CRASHES

Data Source: SWITRS, Crossroads (Jan 1,2016-Dec 31, 2020)

Fatal or Serious Injury Crashes

Other Injury Crashes



Property Damage Only Crashes

Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

A1: I-5 TO BRUCEVILLE
CRASH TYPE AND SEVERITY (2016-2020)

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

PLANNED SAFETY IMPROVEMENTS

The Connector Project provides a new roadway connection between Hood Franklin Road (just east of I-5) and Kammerer Road. This provides a more direct route, compared to the existing, disjointed route utilizing Franklin Boulevard, Bilby Road, and Bruceville Road. The new roadway will be a four-lane multimodal facility, with a landscape median and wide outside shoulders. The Connector Project presents the opportunity to utilize a Performance-Based Design Approach and bring the corridor up to the latest design standards.

TOTAL POTENTIAL REDUCTION IN CRASHES FROM SIGNAL IMPROVEMENTS (OVER A 5 YEAR PERIOD) = **6 CRASHES**

BASED ON SIGNALIZATION OF HOOD FRANKLIN ROAD/I-5 NORTHBOUND RAMPS AND NEW CONNECTOR ROADWAY-KAMMERER ROAD/BRUCEVILLE ROAD

The methodology used to assess the crash reduction uses the crash history to provide a basis for the estimate. Segment A1 of the Connector provides an alternative route between I-5 and Krammer Road and is largely a new roadway. Therefore, the estimated crash reduction reflects improvements to existing intersections.

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

- **BACKBONE COMMUNICATIONS**
- **VEHICLE DETECTION**
- **CLOSED-CIRCUIT TELEVISION CAMERAS**
- **CHANGEABLE MESSAGE SIGNS**

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

KEY SAFETY IMPROVEMENTS:

Signalized intersections at Hood Franklin Road/I-5 Northbound Ramps, new Connector Roadway/Franklin Boulevard, and new Connector Roadway-Kammerer Road/Bruceville Road: These intersections replace or provide alternatives to existing two-way stop-controlled intersections. Two crashes were reported at the existing I-5 Northbound Off Ramps, including a serious injury crash and other injury crash. 18 crashes were reported at the existing intersection of Kammerer Road/Bruceville Road, including one serious injury crash and ten other injury crashes. Traffic signals are expected to reduce crashes by 30 percent compared to two-way stop-controlled intersections, based on data in the publication *Local Roadway Safety: A Manual for California's Local Road Owners*.

Grade-separated railroad crossing east of Franklin Boulevard: The existing crossing on Bigby Road is at-grade, with the closet grade-separated crossing approximately two miles north on Elk Grove Boulevard.

Modern cross section: The Connector includes four travel lanes, wider shoulders, clear recovery zones, and a landscape median, which help reduce head-on, fixed object, and sideswipe crashes. Crash data reviewed for the existing segment and parallel routes included two head-on crashes, 18 fixed object crashes, and one sideswipe crash.

Bicycle and pedestrian facilities: The Connector Project includes a separated multi-use path, filling a gap in pedestrian and bicycle connectivity in the area. A pedestrian crash was reported on Hood Franklin Road about a half-mile east of the I-5 northbound ramps, which resulted in an injury.

Limited access points: The Connector Project provides a limited access roadway, compared to the existing connection between I-5 and Kammerer Road, which is indirect and includes numerous residential and business access points. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

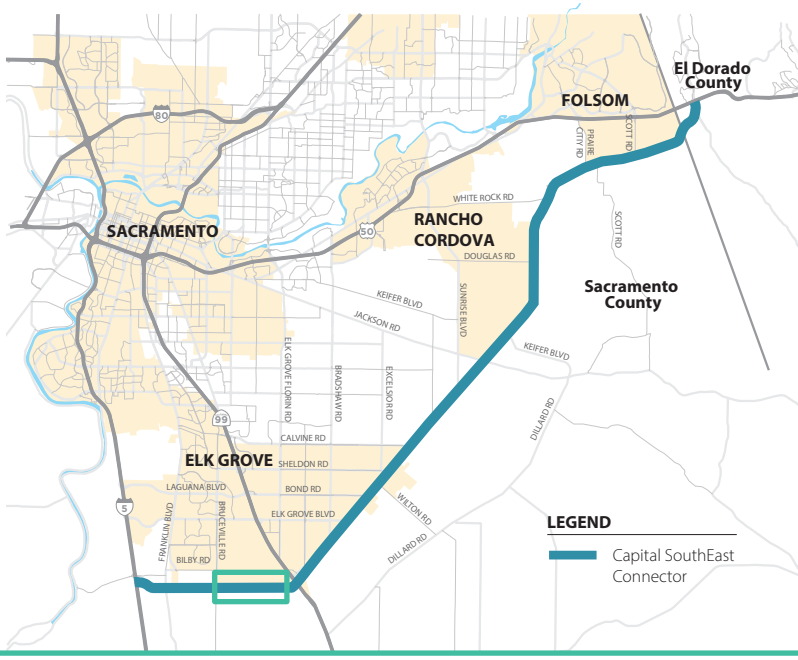
A2: BRUCEVILLE ROAD TO STATE ROUTE 99 (CA-99)

LENGTH: 2.6 miles

JURISDICTION: City of Elk Grove and Sacramento County

INTENT: Provide a thoroughfare that accommodates planned development and agricultural operations, yet limits access and cross-street connections

STATUS: NEPA in progress, construction started on interim phase in May 2020



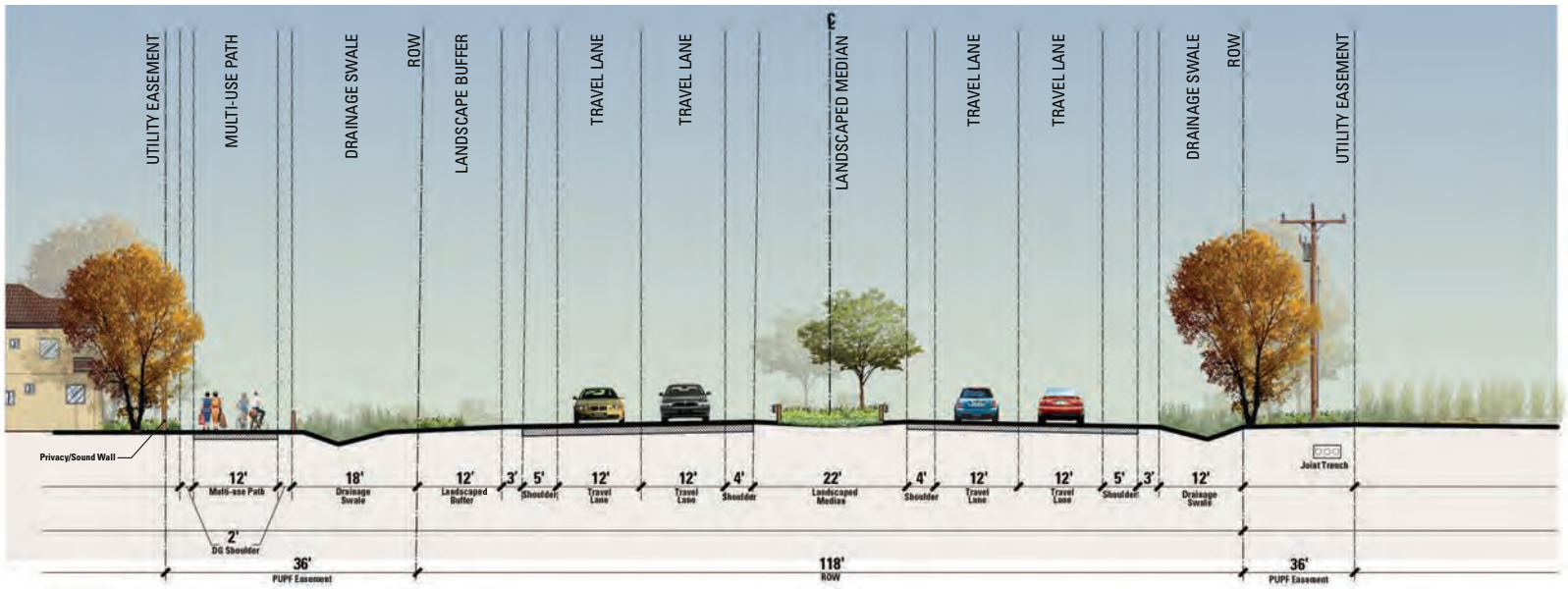
EXISTING CORRIDOR INCLUDES:

- Three signalized intersections
- Full access at residential driveways and cross-street connections along the corridor
- Utility poles immediately adjacent to the roadway
- West of Lent Ranch Parkway: two travel lanes with minimal to no shoulders
- East of Lent Rach Parkway: six travel lanes, bike lanes, partial sidewalks

FUTURE CORRIDOR INCLUDES:

- Limited access points
- Separated multi-use path
- Four to six travel lanes, wider shoulders, landscape median
- Smart Corridor elements
- Roadway lighting at intersections
- Relocation of utilities to public utilities easement outside clear recovery zone

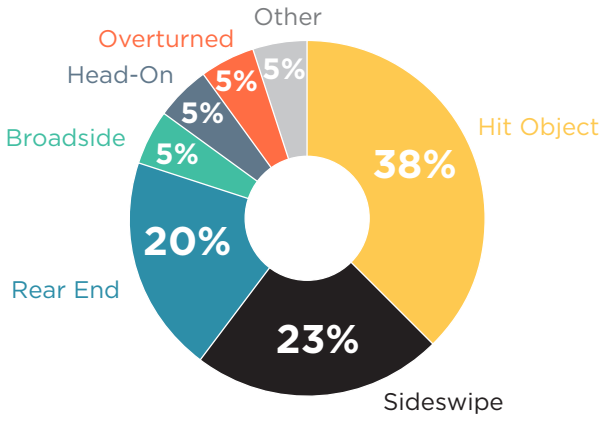
FUTURE CROSS SECTION:



CRASH DATA SUMMARY

A2: BRUCEVILLE ROAD TO STATE ROUTE 99 (CA-99)

CRASH TYPE

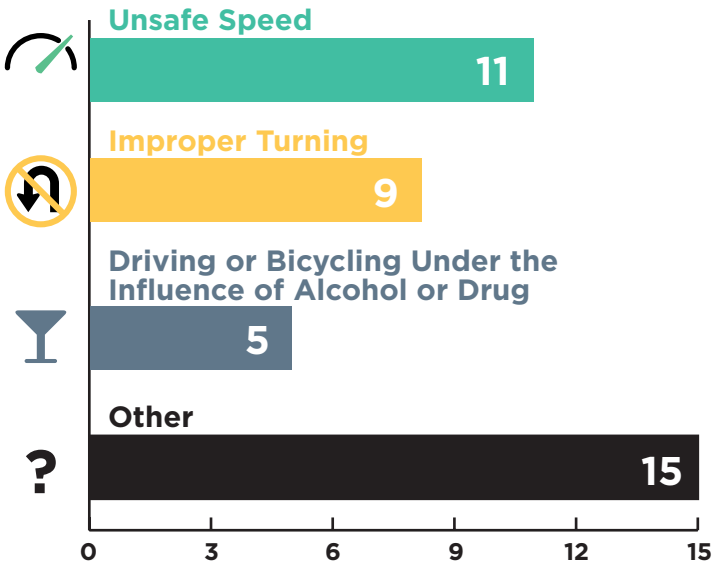


REAR END 20%

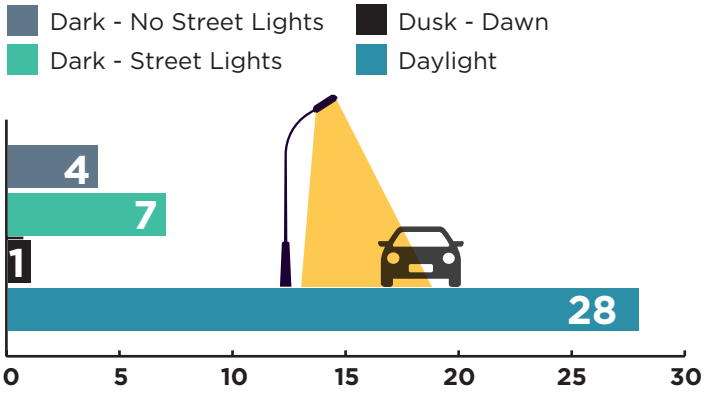
SIDESWIPE 23%

HIT OBJECT 38%

CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

18 SEGMENT CRASHES

22 INTERSECTION CRASHES

CRASHES BY YEAR AND SEVERITY

Year	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	1	4	1	6
2017	1	4	7	12
2018	-	3	3	6
2019	1	4	-	5
2020	1	2	8	11
Total	4	17	19	40

OTHER STATS TO HIGHLIGHT

4 SERIOUS INJURY CRASHES

40 TOTAL CRASHES

Data Source: SWITRS, Crossroads (Jan 1, 2016-Dec 31, 2020)

Fatal or Serious Injury Crashes

Other Injury Crashes

Property Damage Only Crashes

Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

A2: BRUCEVILLE TO CA-99
CRASH TYPE AND SEVERITY (2016-2020)

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

PLANNED SAFETY IMPROVEMENTS

The Connector Project specifically targets the crash types currently happening on the corridor, transforming the existing two-lane section with narrow shoulders and roadside obstructions into a four-lane multimodal facility with a landscape median and wide outside shoulders. The Connector project's performance-based design approach will bring the corridor up to the latest design standards. Specific elements anticipated to improve the corridor's safety performance are shown below.

ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
Landscape Median	22' wide landscaped median	25% - Crashes within limits of new median	2 head-on crashes	1 crash
Shoulder Widening	5' inner shoulders, 10' outer shoulders	30% - Crashes within limits of new paved shoulder	15 fixed object crashes 9 sideswipe crashes	7 crashes
Clear Recovery Zone	20' feet or more of drainage swale/vegetated buffer	35% - Crashes in new clear recovery zone	15 fixed object crashes	5 crashes
Multi-Use Path	10-12' multi-use path separated from roadway	80% - Pedestrian and bicycle crashes	0 pedestrian crashes or bicycle crashes	0 crashes[3]
Lighting	Lighting at interchanges and intersections	40% - Night crashes at intersections	1 intersection crash in dark conditions with no street lights	<1 crash

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
3 Multi-use path likely to induce demand and provide a safer environment for future users
**Potential crash reductions is over 5 year period*

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

- **BACKBONE COMMUNICATIONS**
- **VEHICLE DETECTION**
- **CLOSED-CIRCUIT TELEVISION CAMERAS**
- **CHANGEABLE MESSAGE SIGNS**

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

TOTAL POTENTIAL REDUCTION OVER 5 YEARS= **11 CRASHES**

(BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.)

KEY SAFETY IMPROVEMENTS:

Rau Road Access Road: The Connector Project includes creating a frontage connection from Rau Road to either Bruceville Road or Big Horn Boulevard, eliminating the existing two-way stop-controlled intersection. Three crashes were reported at this intersection, including one serious injury crash and one other injury crash.

Limited access points: Where possible, access locations will be consolidated or removed, which reduces potential conflict points and minimizes variations in speeds associated with turning movements along the corridor. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

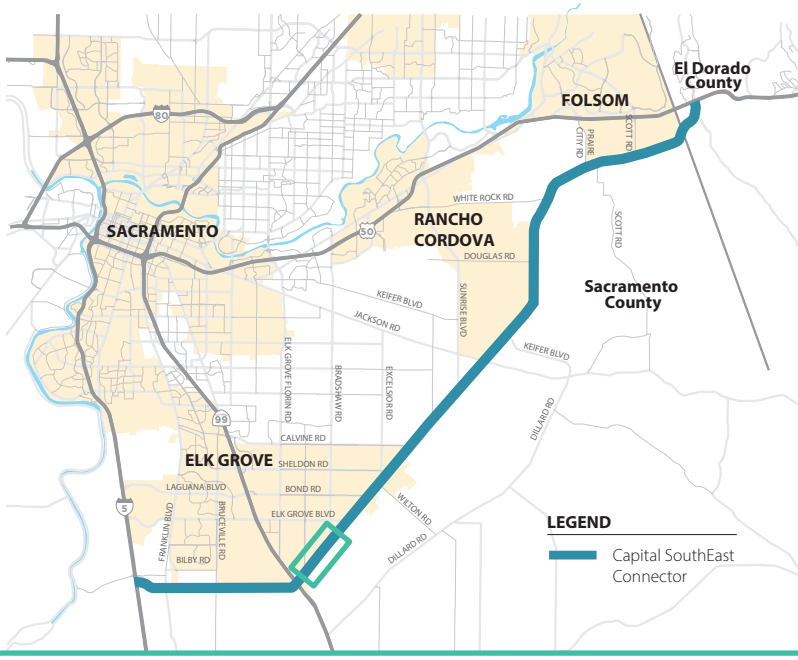
B2: WATERMAN ROAD TO BRADSHAW ROAD

LENGTH: 1.3 miles

JURISDICTION: City of Elk Grove and Sacramento County

INTENT: Provide a thoroughfare that accommodates planned development and agricultural operations, yet limits access and cross-street connections

STATUS: NEPA complete, construction of four travel lanes and Class 1 path complete, ITS and smart corridor elements to be added in future.



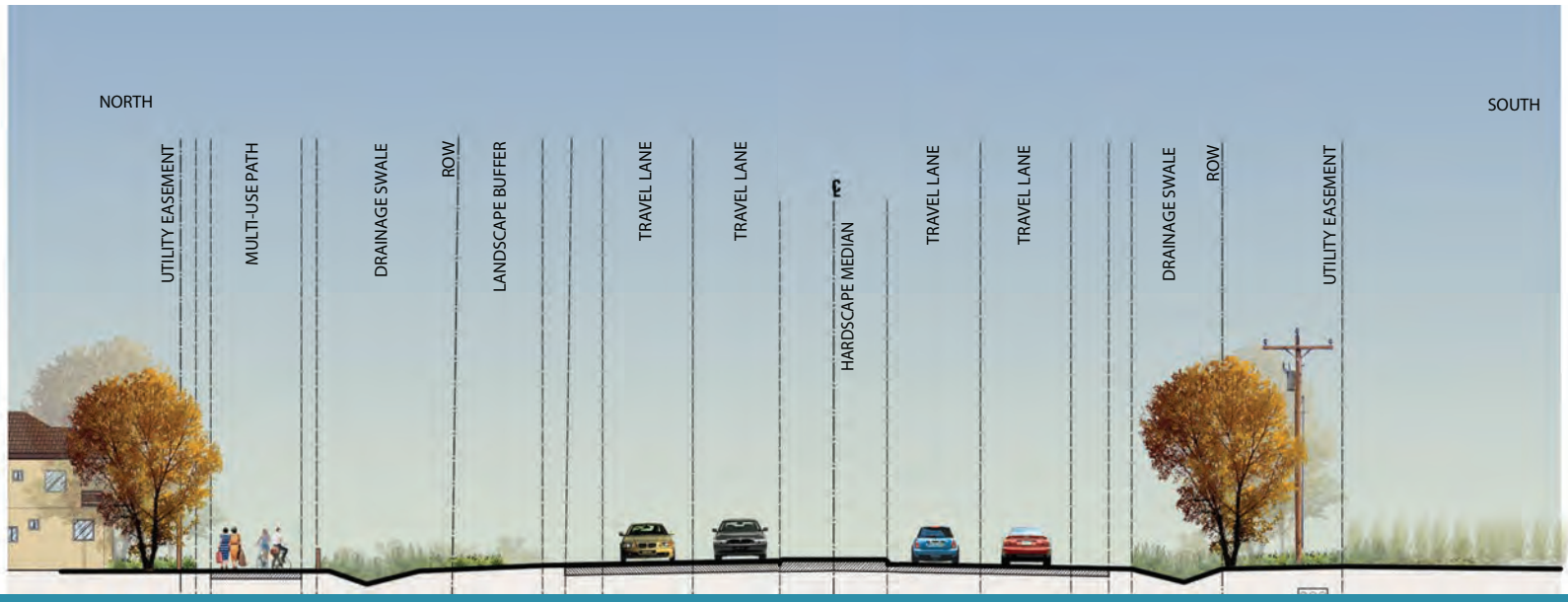
EXISTING CORRIDOR INCLUDES:

- Full access at residential driveways and cross-street connections along the corridor
- Two travel lanes with 4- to 6-foot shoulders
- Utility poles immediately adjacent to the roadway

FUTURE CORRIDOR INCLUDES:

- Signal installation at Mosher Road
- Realignment of Bradshaw Road to intersection Grant Line Road perpendicularly and installation of a signal
- Limited access points
- Separated multi-use path
- Four travel lanes, wider shoulders, paved median
- Smart Corridor elements
- Roadway lighting at intersections
- Relocation of utilities to public utilities easement outside clear recovery zone

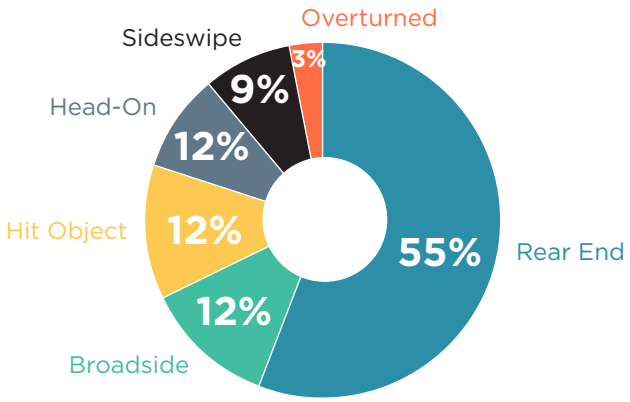
FUTURE CROSS SECTION:



CRASH DATA SUMMARY

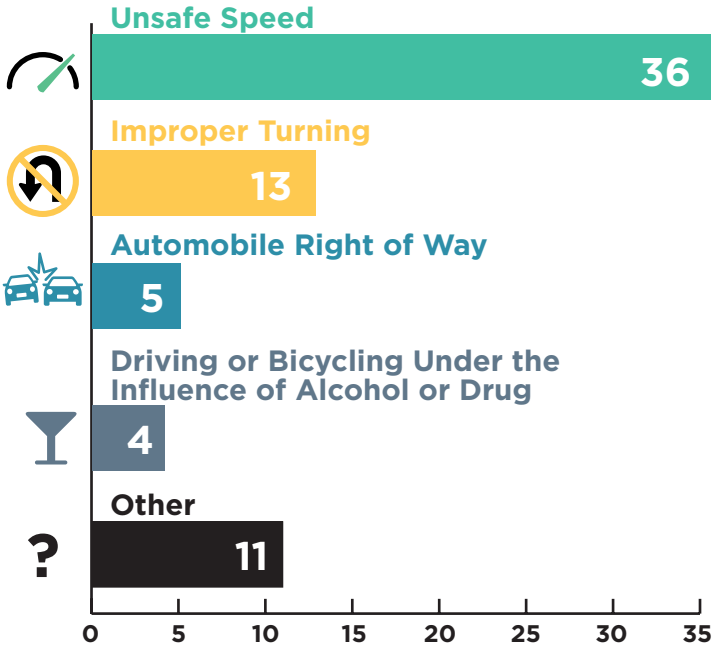
B2: WATERMAN ROAD TO BRADSHAW ROAD

CRASH TYPE

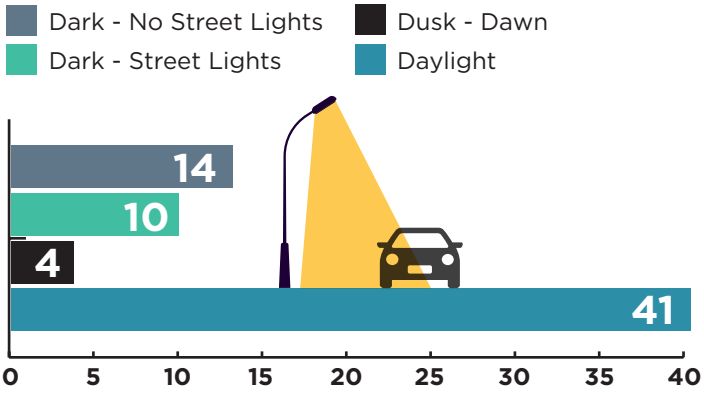


HEAD-ON 12%
HIT OBJECT 12%
BROADSIDE 12%
REAR END 55%

CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

20 SEGMENT CRASHES

49 INTERSECTION CRASHES, INCLUDING:

- **13** CRASHES AT MOSHER ROAD
- **25** CRASHES AT BRADSHAW ROAD

CRASHES BY YEAR AND SEVERITY

Year	Fatal	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	1	-	2	8	11
2017	-	-	10	6	16
2018	-	-	6	6	12
2019	-	1	6	10	17
2020	-	1	6	6	13
Total	1	2	30	36	69

OTHER STATS TO HIGHLIGHT

1 FATAL CRASH

2 SERIOUS INJURIES

69 TOTAL CRASHES

Data Source: SWITRS, Crossroads (Jan 1, 2016-Dec 31, 2020)

Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

B2: WATERMAN TO BRADSHAW
CRASH TYPE AND SEVERITY (2016-2020)

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

PLANNED SAFETY IMPROVEMENTS

The Connector Project specifically targets the crash types currently happening on the corridor, transforming the existing two-lane section with narrow shoulders and roadside obstructions into a four-lane multimodal facility with a paved median and wide outside shoulders. The Connector project's performance-based design approach will bring the corridor up to the latest design standards. Specific elements anticipated to improve the corridor's safety performance are shown below.

ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
Paved median	2-16' wide median	25% - Crashes within limits of new median	4 head-on crashes	2 crash
Shoulder widening	8' shoulders	30% - Crashes within limits of new paved shoulder	5 fixed object crashes 2 sideswipe crashes	2 crashes
Clear recovery zone	Varied drainage swale/vegetated buffer	35% - Crashes in new clear recovery zone	5 fixed object crashes	2 crashes
Multi-use path	12' multi-use path separated from roadway	80% - Pedestrian and bicycle crashes	0 pedestrian crash or bicycle crashes	0 crashes[3]
Install traffic signal	Grant Line Road/Mosher Road Grant Line Road/Bradshaw Road	30% - Intersection crashes	38 crashes	11 crashes
Lighting	Lighting at interchanges and intersections	40% - Night crashes at intersections	7 intersection crashes in dark conditions with no street lights	3 crashes

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
3 Multi-use path likely to induce demand and provide a safer environment for future users

**Potential crash reductions is over 5 year period*

TOTAL POTENTIAL REDUCTION OVER 5 YEARS = 15 CRASHES

(BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.)

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

- BACKBONE COMMUNICATIONS
- VEHICLE DETECTION
- CLOSED-CIRCUIT TELEVISION CAMERAS
- CHANGEABLE MESSAGE SIGNS

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

KEY SAFETY IMPROVEMENTS:

Signalization at Mosher Road and Bradshaw Road: The existing two-way stop-controlled intersection at Mosher Road will be signalized, including additional turn lanes and ITS infrastructure that will enable tracking of the intersection's performance and data-driven refinements to signal operations. Thirteen crashes were reported at this intersection, including five other injury crashes. Bradshaw Road will be realigned to meet Grant Line Road more perpendicularly and signalized, with turn-lanes and ITS infrastructure. Twenty-five crashes were reported at this intersection, including thirteen other injury crashes.

Limited access points: Where possible, access locations will be consolidated or removed, which reduces potential conflict points and minimizes variations in speeds associated with turning movements along the corridor. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

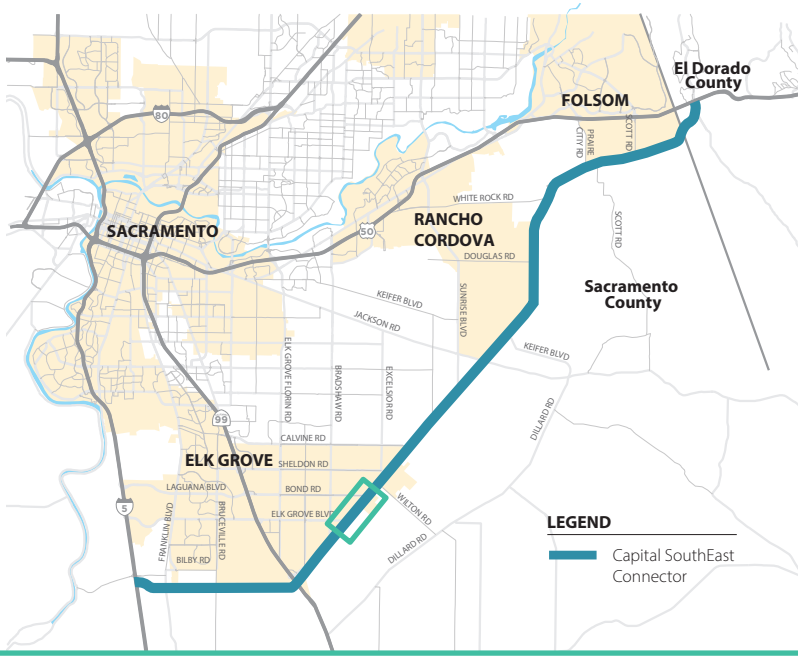
B3: BRADSHAW ROAD TO BOND ROAD

LENGTH: 2.1 miles

JURISDICTION: City of Elk Grove and Sacramento County

INTENT: Provide a thoroughfare that accommodates planned development and agricultural operations, yet limits access and cross-street connections

STATUS: NEPA scheduled to begin in 2025



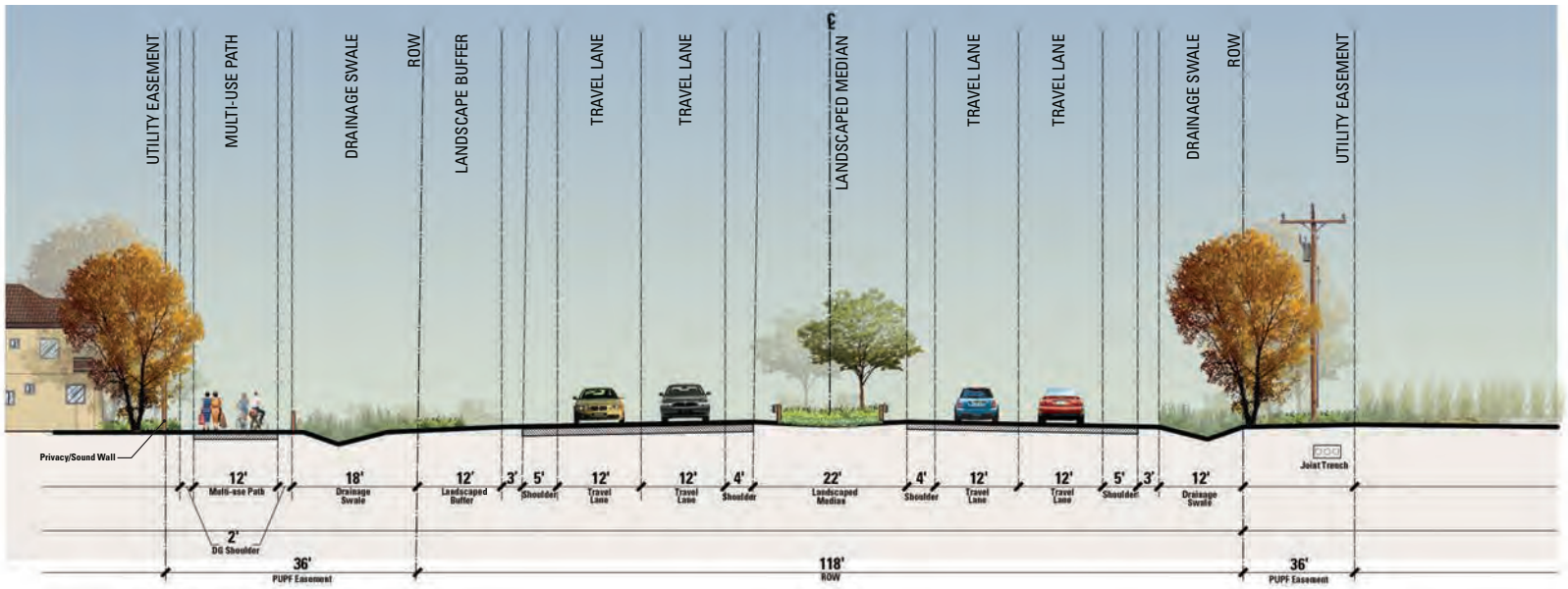
EXISTING CORRIDOR INCLUDES:

- Full access at residential driveways and cross-street connections along the corridor
- Two travel lanes with minimal to no shoulders
- Utility poles immediately adjacent to the roadway

FUTURE CORRIDOR INCLUDES:

- Signal installation at Elk Grove Boulevard
- Limited access points
- Separated multi-use path
- Four travel lanes, wider shoulders, landscape median
- Smart Corridor elements
- Roadway lighting at intersections
- Relocation of utilities to public utilities easement outside clear recovery zone

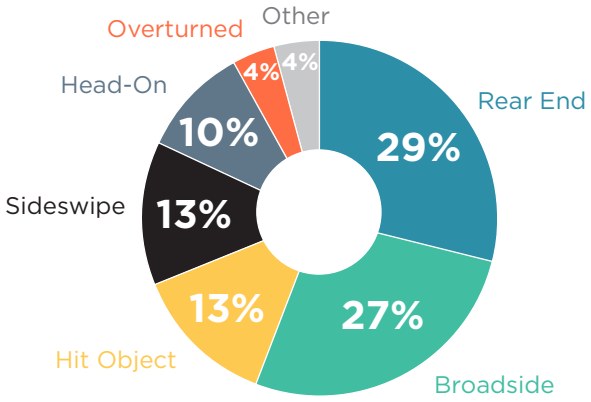
FUTURE CROSS SECTION:



CRASH DATA SUMMARY

B3: BRADSHAW ROAD TO BOND ROAD

CRASH TYPE



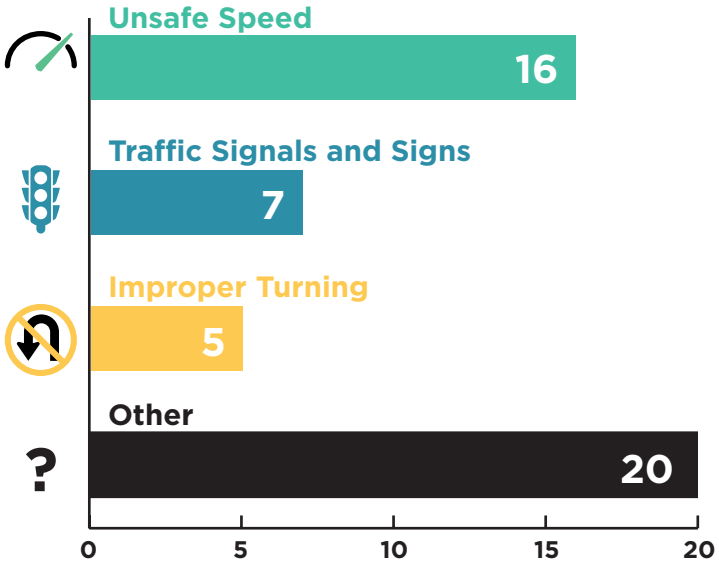

SIDESWIPE 23%

HIT OBJECT 13%

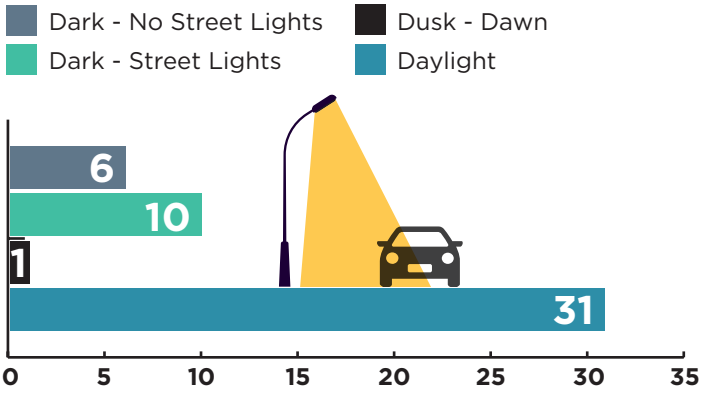

BROADSIDE 27%


REAR END 29%

CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

11 SEGMENT CRASHES

37 INTERSECTION CRASHES, INCLUDING:

29 CRASHES AT ELK GROVE BLVD

CRASHES BY YEAR AND SEVERITY

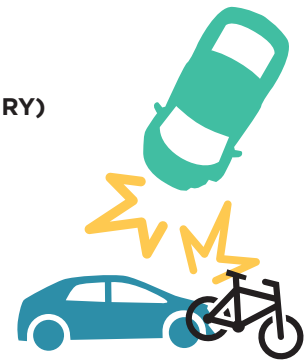
Year	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	-	7	7	14
2017	-	4	7	11
2018	1	2	4	7
2019	-	6	3	9
2020	-	3	4	7
Total	1	22	25	48

OTHER STATS TO HIGHLIGHT

1 SERIOUS INJURY CRASH

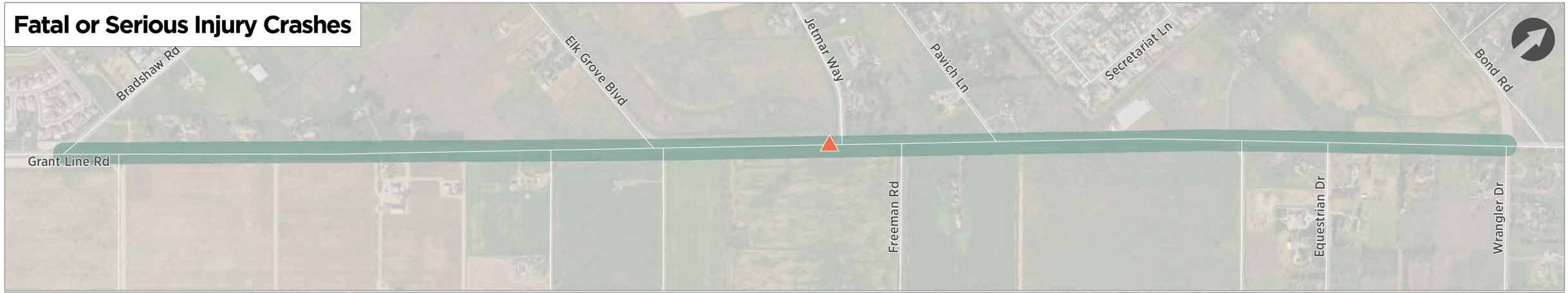
1 BICYCLE CRASH (OTHER INJURY)

48 TOTAL CRASHES

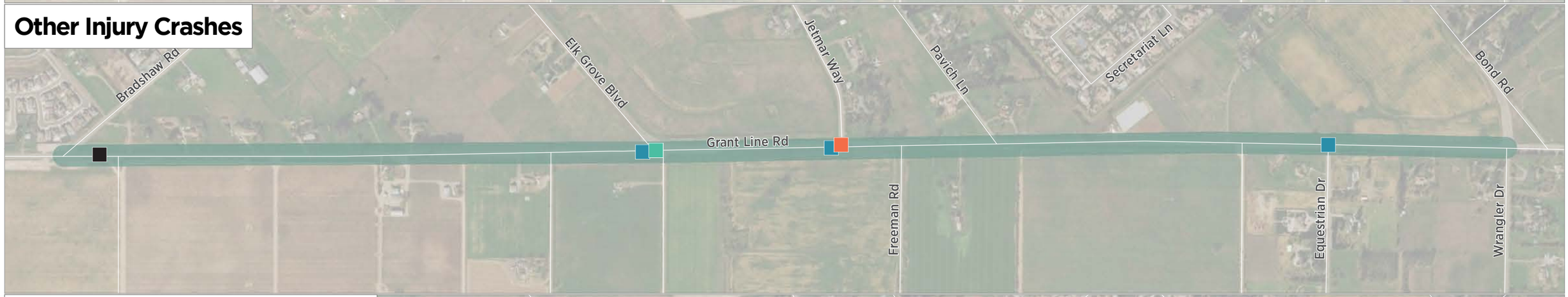


Data Source: SWITRS, Crossroads (Jan 1, 2016-Dec 31, 2020)

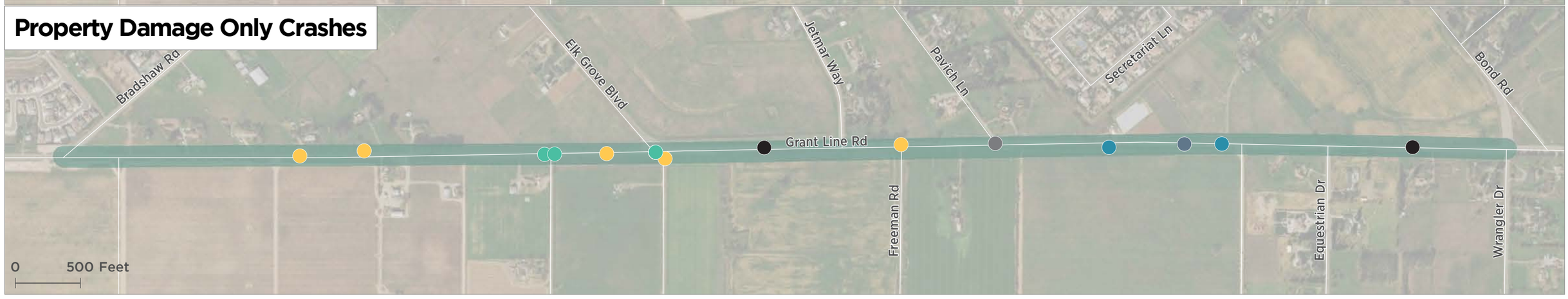
Fatal or Serious Injury Crashes



Other Injury Crashes



Property Damage Only Crashes



Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

B3: BRADSHAW TO BOND
CRASH TYPE AND SEVERITY (2016-2020)

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

PLANNED SAFETY IMPROVEMENTS

The Connector Project specifically targets the crash types currently happening on the corridor, transforming the existing two-lane section with narrow shoulders and roadside obstructions into a four-lane multimodal facility with a landscape median and wide outside shoulders. The Connector project's performance-based design approach will bring the corridor up to the latest design standards. Specific elements anticipated to improve the corridor's safety performance are shown below.

ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
Landscape median	36' wide landscaped median	25% - Crashes within limits of new median	2 head-on crashes	1 crash
Shoulder widening	5' inner shoulders, 10' outer shoulders	30% - Crashes within limits of new paved shoulder	5 fixed object crashes 3 sideswipe crashes	2 crashes
Clear recovery zone	20' feet or more of drainage swale/vegetated buffer	35% - Crashes in new clear recovery zone	5 fixed object crashes	2 crashes
Multi-use path	10-12' multi-use path separated from roadway	80% - Pedestrian and bicycle crashes	1 bicycle crash	1 crash
Install traffic signal	Grant Line Road/Elk Grove Boulevard	30% - Intersection crashes	29 crashes	9 crashes
Lighting	Lighting at interchanges and intersections	40% - Night crashes at intersections	1 intersection crash in dark conditions with no street lights	<1 crash

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
**Potential crash reductions is over 5 year period*

TOTAL POTENTIAL REDUCTION OVER 5 YEARS = 11 CRASHES

(BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.)

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

- **BACKBONE COMMUNICATIONS**
- **VEHICLE DETECTION**
- **CLOSED-CIRCUIT TELEVISION CAMERAS**
- **CHANGEABLE MESSAGE SIGNS**

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

KEY SAFETY IMPROVEMENTS:

Signalization at Elk Grove Boulevard: The existing all-way stop-controlled intersection at Elk Grove Boulevard will be signalized, including additional turn lanes and ITS infrastructure that will enable tracking of the intersection's performance and data-driven refinements to signal operations. Twenty-nine crashes were reported at the intersect, including sixteen other injury crashes, seven of which were broadside crashes. In addition, the existing access at Jetmar Way will be realigned to intersection Elk Grove Boulevard and utilize the planned signal. Three crashes were reported at the intersection at Jetmar Way, including one serious injury crash and two other injury crashes

Limited access points: Where possible, access locations will be consolidated or removed, which reduces potential conflict points and minimizes variations in speeds associated with turning movements along the corridor. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

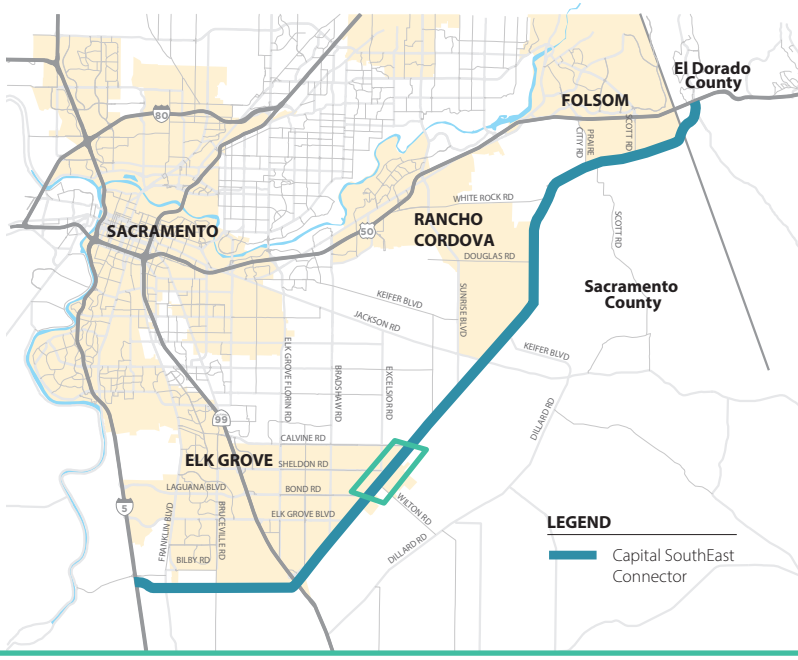
C: BOND ROAD TO CALVINE ROAD (SHELDON SPECIAL SEGMENT)

LENGTH: 2.7 miles

JURISDICTION: City of Elk Grove

INTENT: Provide a thoroughfare roadway that is consistent with the rural setting of the existing developed street network and maintains identified cross-street connections

STATUS: NEPA scheduled to begin in 2023



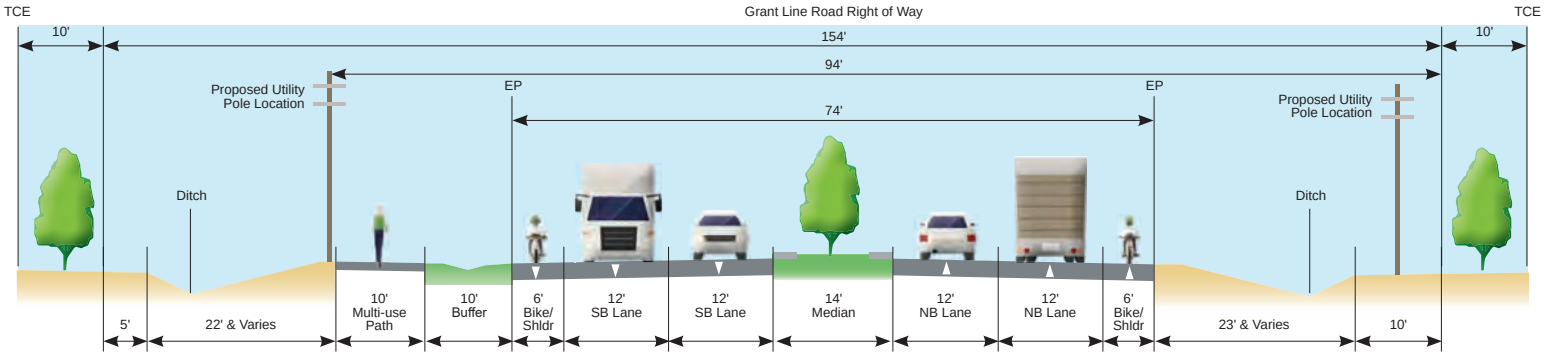
EXISTING CORRIDOR INCLUDES:

- Four signalized intersections
- Full access at residential driveways, businesses, and cross-street connections along the corridor
- Two travel lanes with 6-foot shoulders
- Utility poles immediately adjacent to the roadway

FUTURE CORRIDOR INCLUDES:

- Roundabouts at six locations, including four existing signalized intersections and two two-way stop-controlled intersections
- Limited access points with many existing accesses limited to right-in/right-out
- Separated multi-use path
- Four travel lanes, median, bike lanes/shoulders, clear recovery zone
- Smart Corridor elements
- Roadway lighting at intersections
- Relocation of utilities to public utilities easement outside clear recovery zone

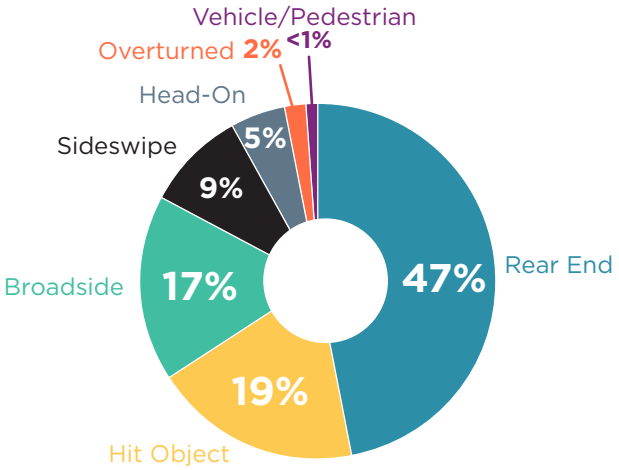
FUTURE CROSS SECTION:



CRASH DATA SUMMARY

C: BOND ROAD TO CALVINE ROAD
(SHELDON SPECIAL SEGMENT)

CRASH TYPE

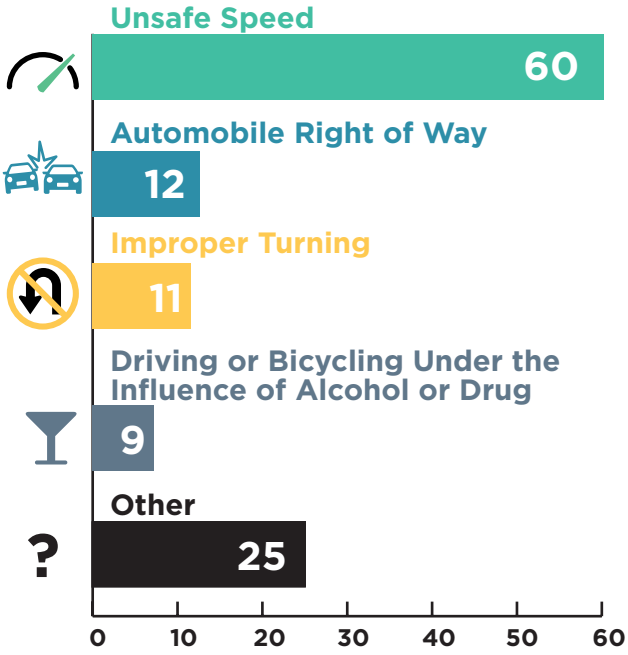


BROADSIDE 17%

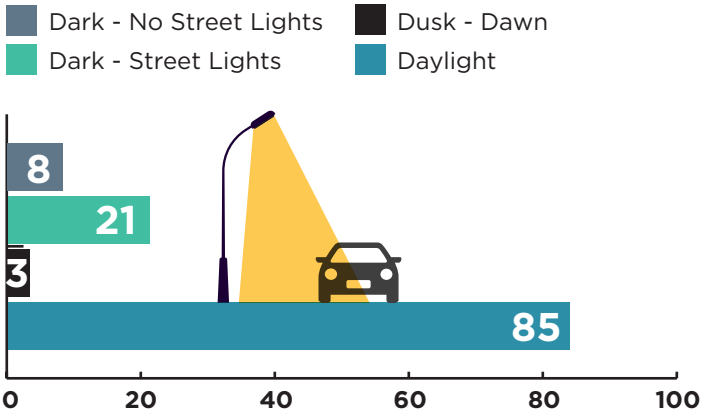
HIT OBJECT 19%

REAR END 47%

CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

13 SEGMENT CRASHES

104 INTERSECTION CRASHES, INCLUDING:

- **9** CRASHES AT BOND ROAD
- **17** CRASHES AT WILTON ROAD
- **10** CRASHES AT ALEILANI LANE
- **19** CRASHES AT SHELDON ROAD
- **1** CRASHES AT GRAYBILL LANE
- **8** CRASHES AT CALVINE ROAD

CRASHES BY YEAR AND SEVERITY

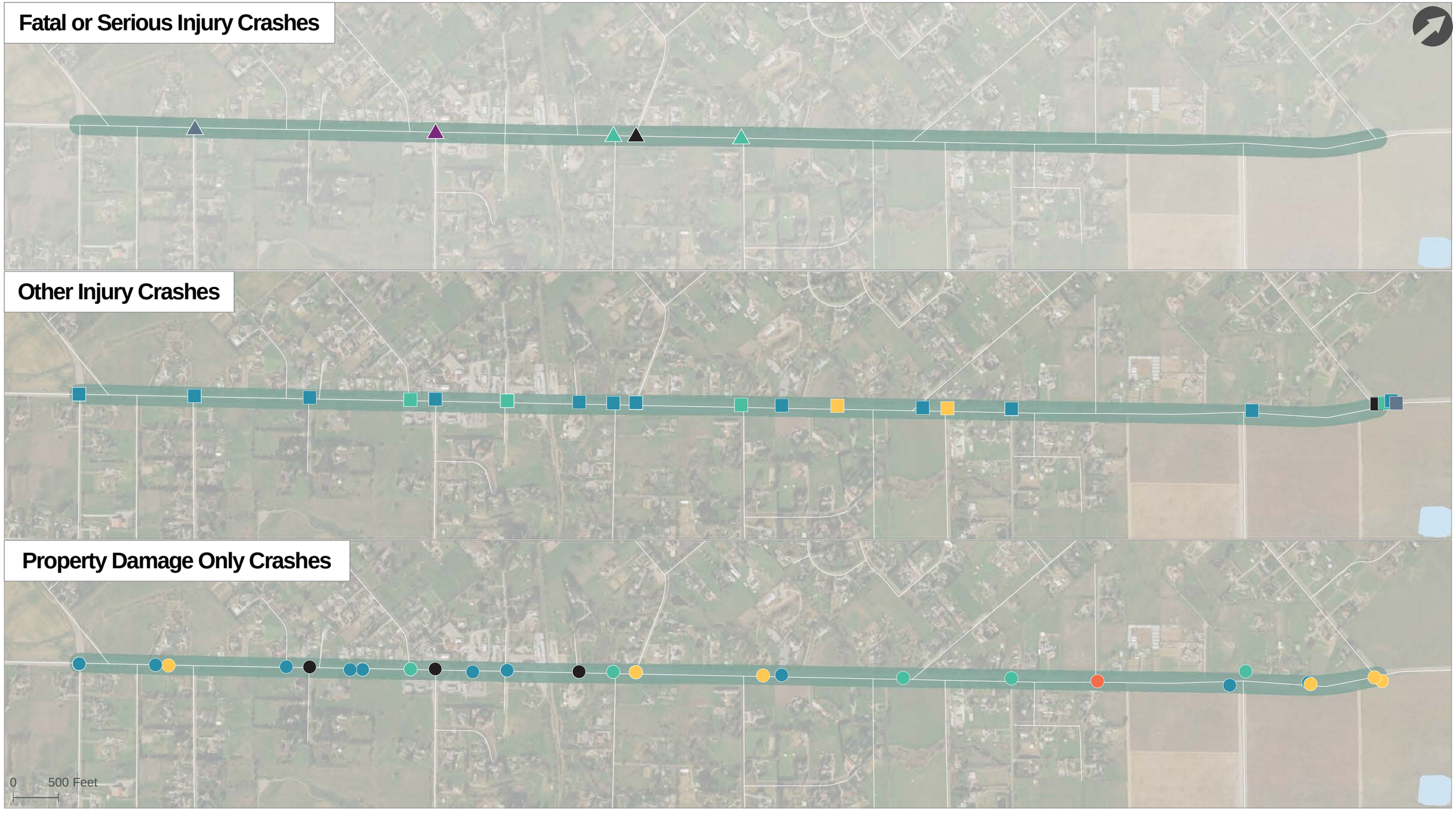
Year	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	-	14	11	25
2017	1	11	12	24
2018	2	13	12	27
2019	4	15	9	28
2020	-	8	5	13
Total	7	61	49	117

OTHER STATS TO HIGHLIGHT

7 SERIOUS INJURY CRASHES

1 PEDESTRIAN CRASH (SERIOUS INJURY)

117 TOTAL CRASHES



Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

C: BOND TO CALVINE
CRASH TYPE AND SEVERITY (2016-2020)

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

PLANNED SAFETY IMPROVEMENTS

The Connector Project specifically targets the crash types currently occurring on the corridor, transforming the existing two-lane section with narrow shoulders and roadside obstructions into a four-lane multimodal facility, with a landscape median and six roundabouts. The Connector Project presents the opportunity to utilize a **performance-based design approach** and bring the corridor up to the **latest design standards**. Specific elements of the Connector Project anticipated to improve the corridor's safety performance are shown below.

ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
Landscape median with guardrail	4-14' wide landscaped median with guardrail	25% - Crashes within limits of new median	2 head-on crashes	1 crash
Clear recovery zone	Where possible, utility poles 20' feet from roadway	35% - Crashes in new clear recovery zone	10 fixed object crashes	4 crashes
Multi-use path	8-10' multi-use path separated from roadway	80% - Pedestrian and bicycle crashes	1 pedestrian crash	1 crashes
Install roundabout (existing signal)	Grant Line Road/Bond Road Grant Line Road/Wilton Road Grant Line Road/Sheldon Road Grant Line Road/Calvine Road	67% - Intersection crashes[3]	53 crashes	36 crashes
Install roundabout (existing two-way stop-control)	Grant Line Road/Aleilani Lane Grant Line Road/Graybill Lane	19% - Intersection crashes[3]	11 crashes	2 crashes
Lighting	Lighting at intersections	40% - Night crashes at intersections	4 intersection crashes in dark conditions with no street lights	2 crashes

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
3 Based on American Association of State Highway Officials Highway Safety Manual

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

- **BACKBONE COMMUNICATIONS**
- **VEHICLE DETECTION**
- **CLOSED-CIRCUIT TELEVISION CAMERAS**
- **CHANGEABLE MESSAGE SIGNS**

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

**Potential crash reductions is over 5 year period*

TOTAL POTENTIAL REDUCTION OVER 5 YEARS = 41 CRASHES

(BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.)

KEY SAFETY IMPROVEMENTS:

Consistent four-lane section with turn lanes: The Connector Project provides a four-lane section throughout the corridor, with turn lanes at access locations, where feasible. The proposed cross section maintains the rural character of the roadway, while modernizing the roadway to better serve all users.

Limited access points: where possible, access locations will be consolidated or removed, which reduces potential conflict points and minimizes variations in speeds associated with turning movements along the corridor. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

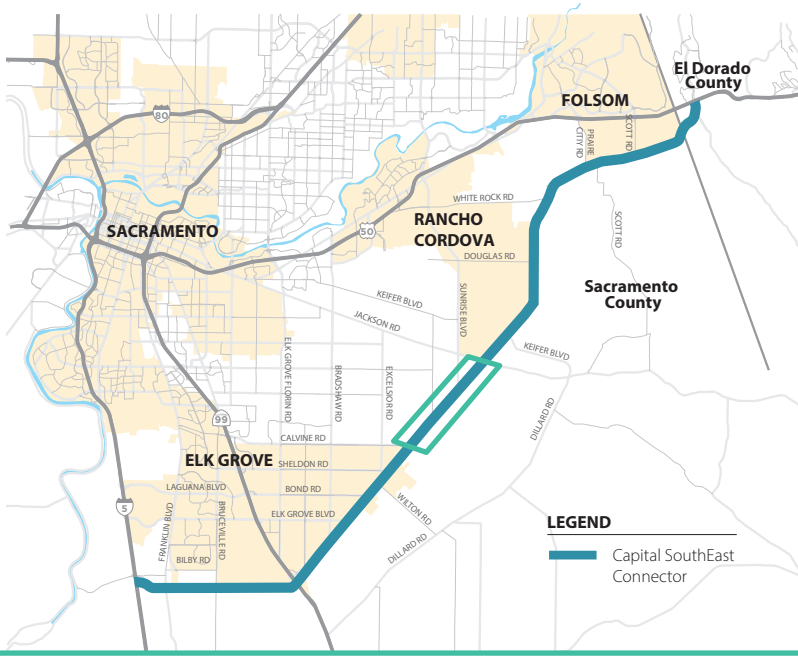
D1: CALVINE RD TO CALIFORNIA HIGHWAY 16 (CA-16)

LENGTH: 4.5 miles

JURISDICTION: Sacramento County

INTENT: Provide a modern expressway with access control and grade-separated interchanges or intersections

STATUS: High-level concepts for improvements



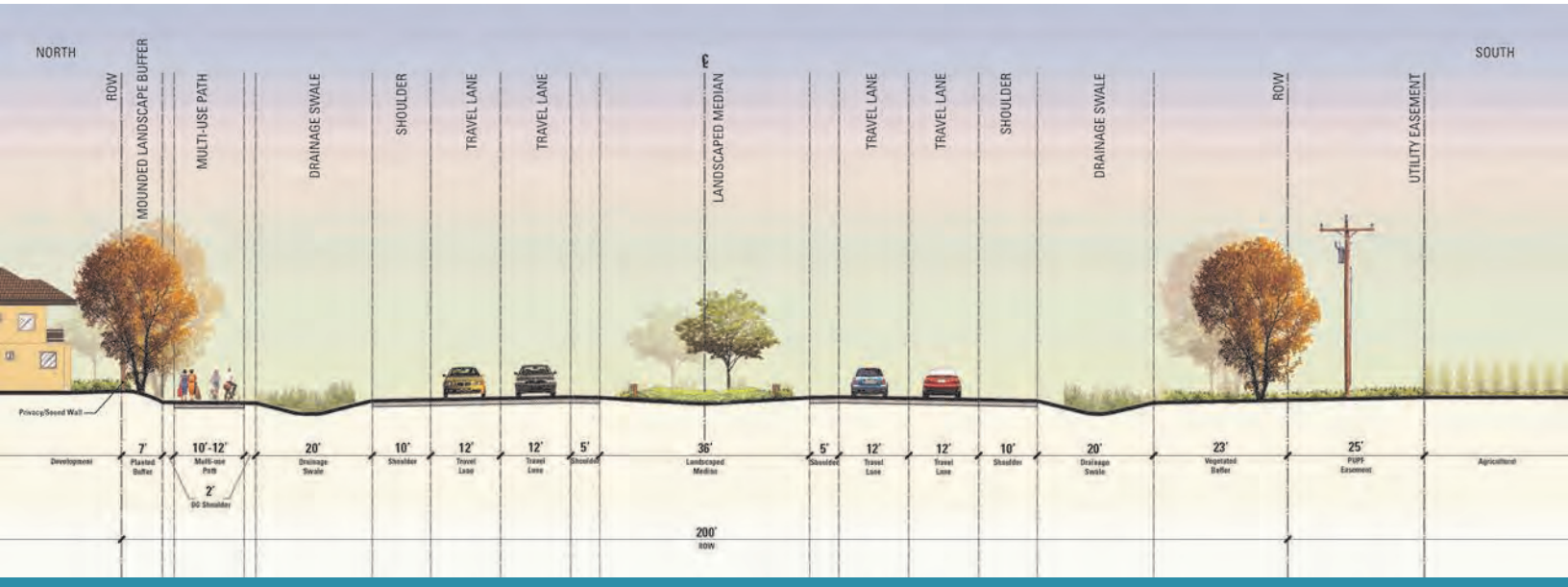
EXISTING CORRIDOR INCLUDES:

- Three signalized intersections
- Full access at residential driveways along the corridor
- Two travel lanes with 4- to 6-foot shoulders
- Utility poles immediately adjacent to the roadway
- Sections with steeper embankments

FUTURE CORRIDOR INCLUDES:

- Signal improvements at Sloughhouse Road
- Grade-separated interchanges at Sunrise Boulevard and Jackson Road
- Limited access points
- Separated multi-use path
- Four travel lanes, wider shoulders, landscape median
- Smart Corridor elements
- Roadway lighting
- Relocation of utilities to public utilities easement outside clear recovery zone

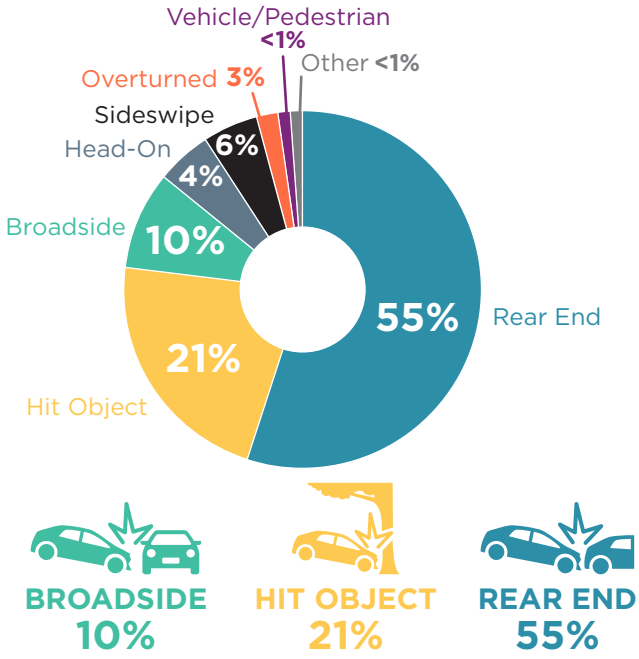
FUTURE CROSS SECTION:



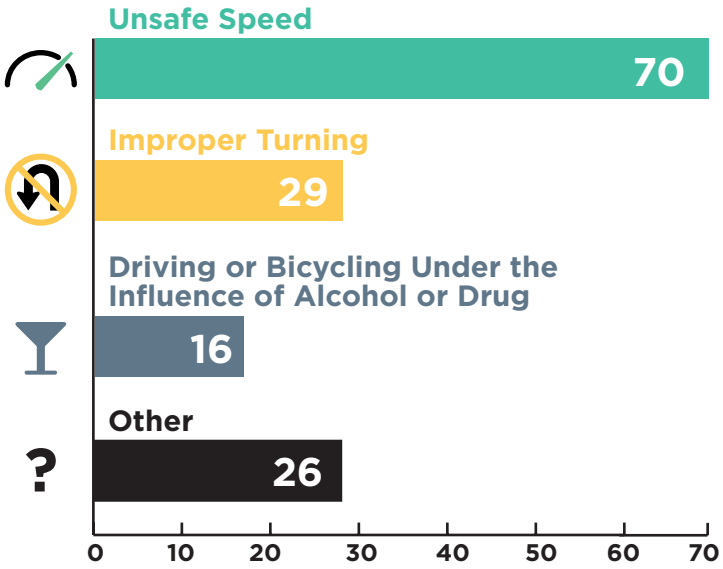
CRASH DATA SUMMARY

D1: Calvine Rd to California Highway 16 (CA-16)

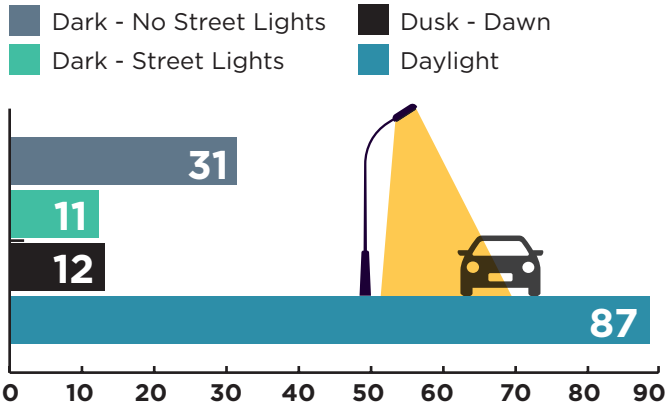
CRASH TYPE



CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

56 SEGMENT CRASHES

85 INTERSECTION CRASHES, INCLUDING:

- **14** CRASHES AT SLOUGHHOUSE ROAD
- **16** CRASHES AT SUNRISE BOULEVARD
- **55** CRASHES AT JACKSON ROAD

CRASHES BY YEAR AND SEVERITY

Year	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	1	15	20	36
2017	-	14	17	31
2018	1	10	12	23
2019	2	13	17	32
2020	2	6	11	19
Total	6	58	77	141

OTHER STATS TO HIGHLIGHT

6 SERIOUS INJURY CRASHES

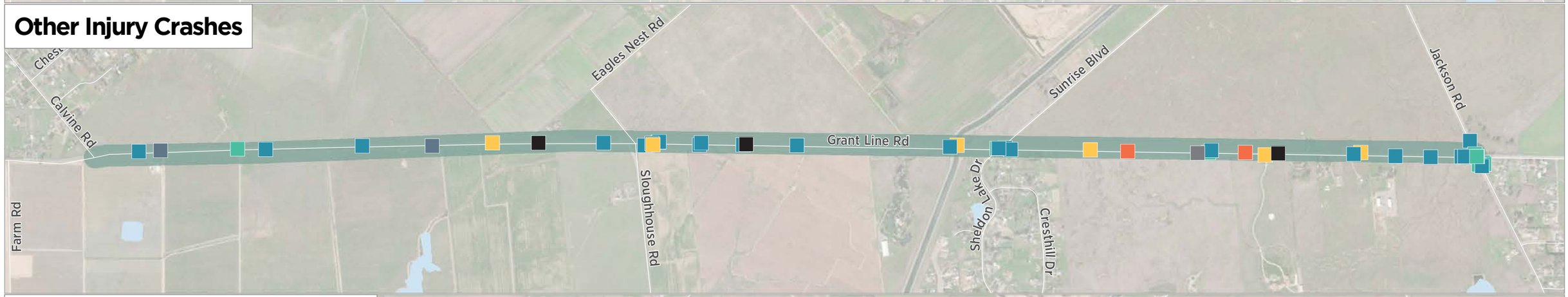
1 PEDESTRIAN CRASH (SERIOUS INJURY)

141 TOTAL CRASHES

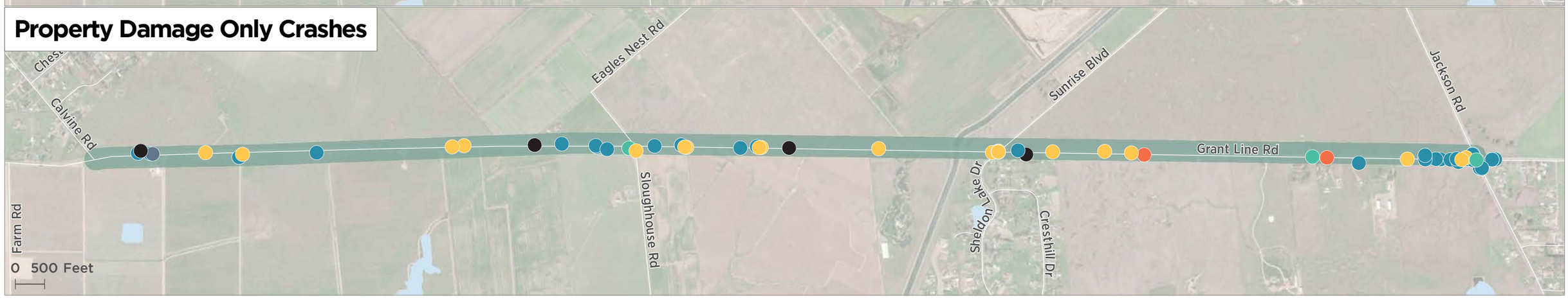
Data Source: SWITRS, Crossroads (Jan 1, 2016-Dec 31, 2020)

Fatal or Serious Injury Crashes

Other Injury Crashes



Property Damage Only Crashes



Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

D1: CALVINE TO CA-16
CRASH TYPE AND SEVERITY (2016-2020)

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

PLANNED SAFETY IMPROVEMENTS

The Connector Project specifically targets the crash types currently happening on the corridor, transforming the existing two-lane section with narrow shoulders and roadside obstructions into a four-lane multimodal facility with a landscape median and wide outside shoulders. The Connector project's performance-based design approach will bring the corridor up to the latest design standards. Specific elements anticipated to improve the corridor's safety performance are shown below.

ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
Landscape Median	36' wide landscaped median	25% - Crashes within limits of new median	3 head-on crashes	1 crash
Shoulder Widening	5' inner shoulders, 10' outer shoulders	30% - Crashes within limits of new paved shoulder	16 fixed object crashes 6 sideswipe crashes	7 crashes
Clear Recovery Zone	20' feet or more of drainage swale/vegetated buffer	35% - Crashes in new clear recovery zone	16 fixed object crashes	6 crashes
Multi-Use Path	10-12' multi-use path separated from roadway	80% - Pedestrian and Bicycle Crashes	12 pedestrian crash	1 crash
Lighting	Lighting at interchanges and intersections	35% - Night Crashes	intersection crashes in dark conditions with no street lights	5 crashes

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
**Potential crash reductions is over 5 year period*

TOTAL POTENTIAL REDUCTION OVER 5 YEARS = **15 CRASHES**

(BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.)

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

- **BACKBONE COMMUNICATIONS**
- **VEHICLE DETECTION**
- **CLOSED-CIRCUIT TELEVISION CAMERAS**
- **CHANGEABLE MESSAGE SIGNS**

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

KEY SAFETY IMPROVEMENTS:

Signal improvements at Sloughhouse Road: The existing signal at Sloughhouse Road will be redesigned to include additional turn lanes, longer storage bays, improved signal hardware and timing, and ITS infrastructure. Providing better visibility of intersection signals with improved hardware as well as exclusive left-turn lanes with adequate storage and space to decelerate can help address rear-end crashes. In addition, new ITS infrastructure at the intersection will enable closer tracking of the intersection's performance and data-driven refinements to signal operations.

Grade-separated interchanges: The existing signals at Sunrise Boulevard and Jackson Road will be converted to grade-separated interchanges, removing the existing conflict points on Grant Line Road. The interchanges will be designed to maximize efficiency and safety, using current best practices.

Limited access points: Where possible, access locations will be consolidated or removed, which reduces potential conflict points and minimizes variations in speeds associated with turning movements along the corridor. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

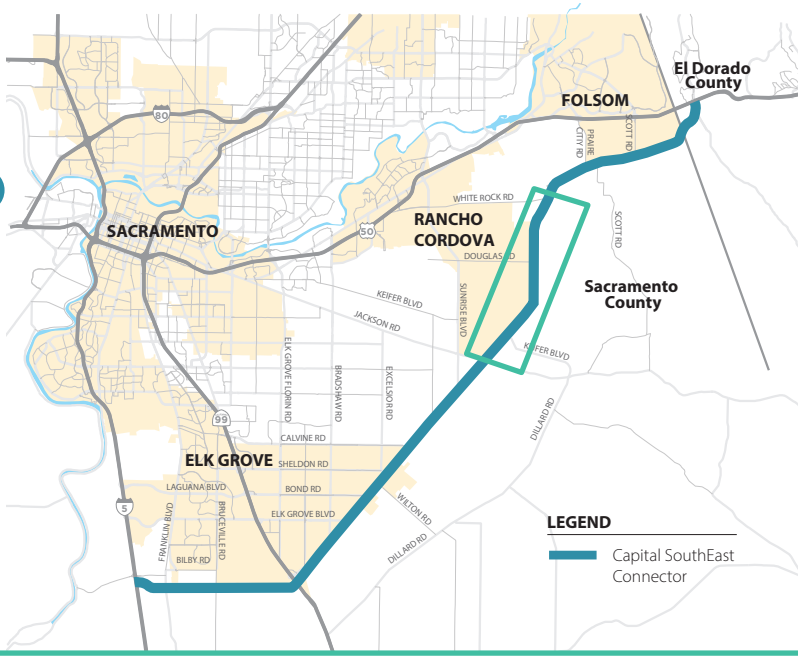
D2: CALIFORNIA HIGHWAY 16 (CA-16) TO WHITE ROCK ROAD

LENGTH: 7.4 miles

JURISDICTION: City of Rancho Cordova and Sacramento County

INTENT: Provide a modern expressway with access control and grade-separated interchanges or intersections

STATUS: Preliminary engineering complete, NEPA approved



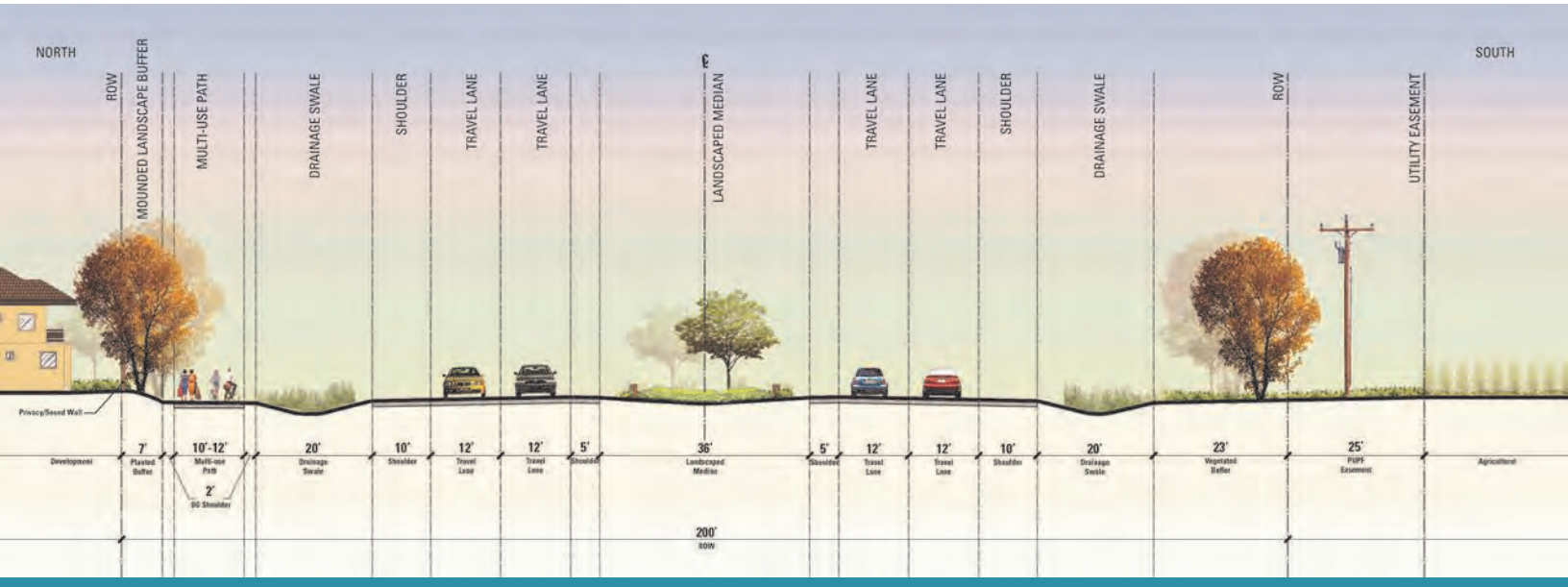
EXISTING CORRIDOR INCLUDES:

- Two signalized intersections
- Full access at residential driveways along the corridor
- Two 10- to 11-foot travel lanes with 6-foot shoulders or less
- Utility poles immediately adjacent to the roadway
- Substandard horizontal curves

FUTURE CORRIDOR INCLUDES:

- Near-term signalized intersections and long-term grade-separated interchanges at six locations, including Kiefer Boulevard, Douglas Boulevard, and White Rock Road
- Limited access points
- Separated multi-use path
- Four travel lanes, wider shoulders, landscape median
- Smart Corridor elements
- Roadway lighting
- Relocation of utilities to public utilities easement outside clear recovery zone

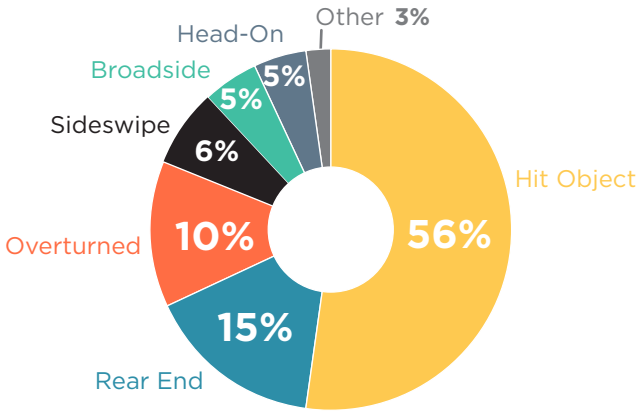
FUTURE CROSS SECTION:



CRASH DATA SUMMARY

D2: CALIFORNIA HIGHWAY 16 (CA-16) TO WHITE ROCK ROAD

CRASH TYPE

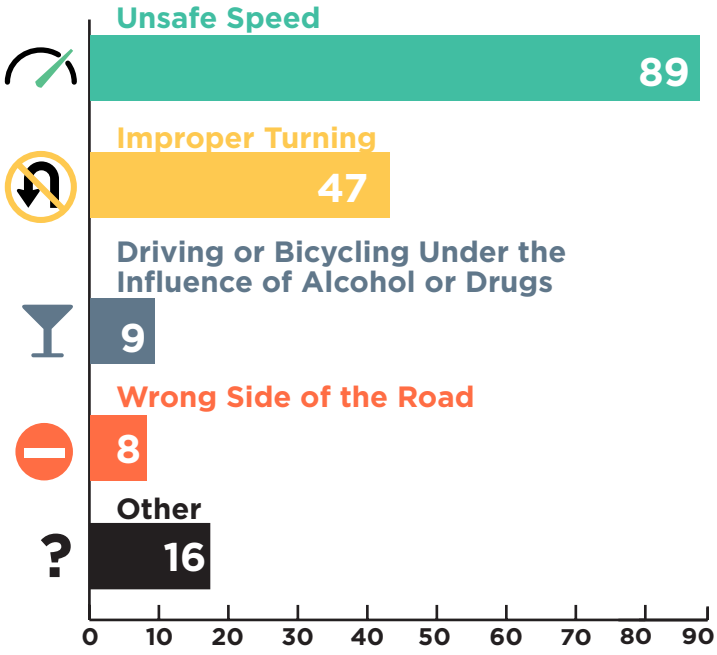


OVERTURNED
10%

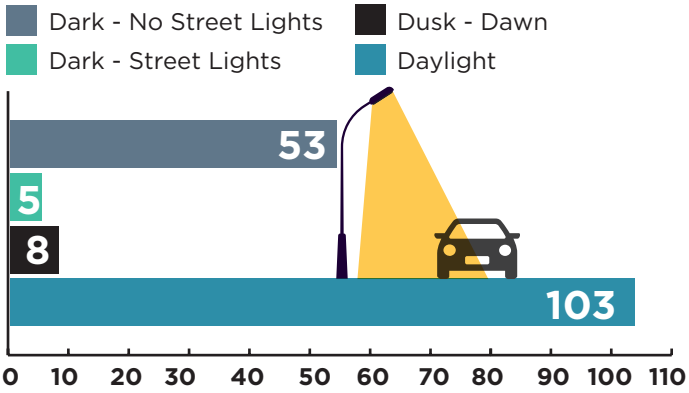
REAR END
15%

HIT OBJECT
56%

CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

127 SEGMENT CRASHES

42 INTERSECTION CRASHES, INCLUDING:

- **11** CRASHES AT GRANT LINE/KIEFER BLVD
- **5** CRASHES AT GRANT LINE/DOUGLAS BLVD
- **5** CRASHES AT GRANT LINE/WHITE ROCK RD

63 CRASHES AT THE HORIZONTAL CURVE WEST OF TEICHERT AGGREGATES

CRASHES BY YEAR AND SEVERITY

Year	Fatal	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	-	-	4	27	31
2017	1	-	9	24	34
2018	-	2	8	34	44
2019	-	1	12	13	26
2020	-	2	10	22	34
Total	1	5	43	120	169

OTHER STATS TO HIGHLIGHT

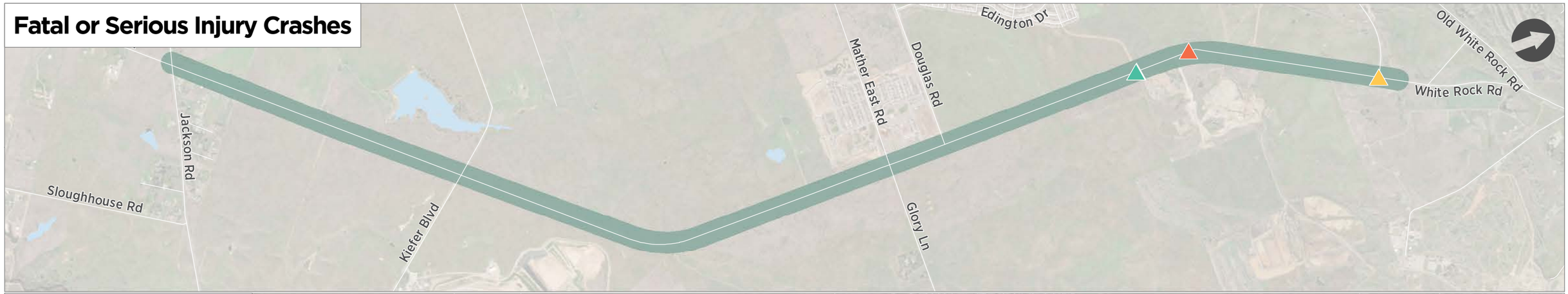
1 FATAL CRASH

5 SERIOUS INJURY CRASHES

169 TOTAL CRASHES

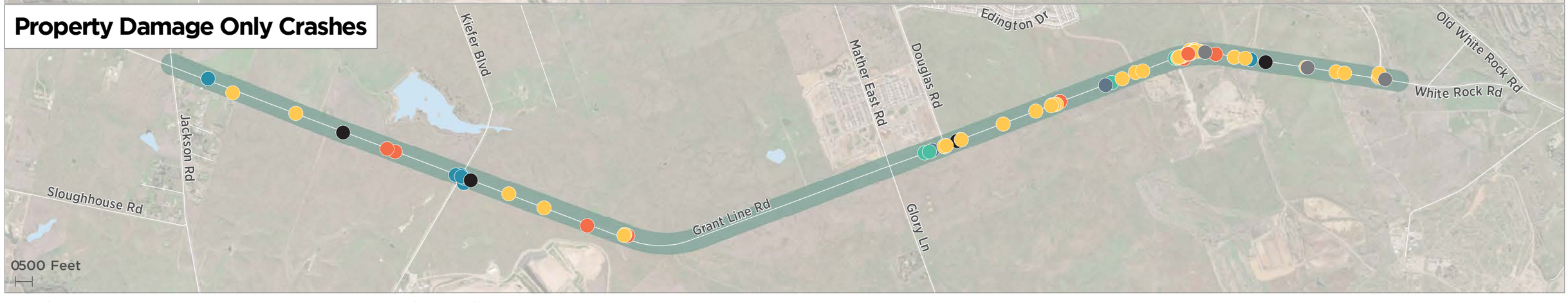
Data Source: SWITRS, Crossroads (Jan 1, 2016-Dec 31, 2020)

Fatal or Serious Injury Crashes



Other Injury Crashes

Property Damage Only Crashes



Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

D2: CA-16 TO WHITE ROCK
CRASH TYPE AND SEVERITY (2016-2020)

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

PLANNED SAFETY IMPROVEMENTS

The Connector Project specifically targets the crash types currently happening on the corridor, transforming the existing two-lane section with narrow shoulders and roadside obstructions into a four-lane multimodal facility with a landscape median and wide outside shoulders. The Connector project's performance-based design approach will bring the corridor up to the latest design standards. Specific elements anticipated to improve the corridor's safety performance are shown below.

ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
Landscape median	36' wide landscaped median	25% - Crashes within limits of new median	8 head-on crashes	2 crashes
Shoulder widening	5' inner shoulders, 10' outer shoulders	30% - Crashes within limits of new paved shoulder	93 fixed object crashes 9 sideswipe crashes	31 crashes
Clear recovery zone	20' feet or more of drainage swale/vegetated buffer	35% - Crashes in new clear recovery zone	93 fixed object crashes	33 crashes
Multi-use path	10-12' multi-use path separated from roadway	80% - Pedestrian and bicycle crashes	0 pedestrian or bicycle crashes	0 crashes[3]
Reduced horizontal curvature	Bring existing horizontal curves up to standards based on roadway character and design speed	50% - Crashes within horizontal curve	63 crashes	32 crashes
Lighting	Lighting at interchanges and intersections	40% - Night crashes at intersections	8 intersection crashes in dark conditions with no street lights	3 crashes

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
3 Multi-use path likely to induce demand and provide a safer environment for future users

**Potential crash reductions is over 5 year period*

TOTAL POTENTIAL REDUCTION OVER 5 YEARS = 66 CRASHES

(BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.)

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

BACKBONE COMMUNICATIONS

VEHICLE DETECTION

CLOSED-CIRCUIT TELEVISION CAMERAS

CHANGEABLE MESSAGE SIGNS

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

KEY SAFETY IMPROVEMENTS:

Improved roadway alignment: The segment includes substandard horizontal and vertical curves, notably the horizontal curve west of Teichert Aggregates, about one-third of a mile north of Raymer Way. 63 crashes were reported along this horizontal curve, including one serious injury crash and fourteen other injury crashes. The Connector Project brings the roadway alignment up to current standards with horizontal and vertical curves consistent with the roadway character and design speed.

Grade-separated interchanges: In the long-term, the existing intersections of Kiefer Boulevard, Douglas Boulevard, and White Rock Road will be converted to grade-separated interchanges. In addition, three additional locations will be developed as interchanges. The interchanges will be designed to maximize efficiency and safety, using current best practices. All six locations will operate as signalized intersections in the near-term.

Limited access points: Where possible, access locations will be consolidated or removed, which reduces potential conflict points and minimizes variations in speeds associated with turning movements along the corridor. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

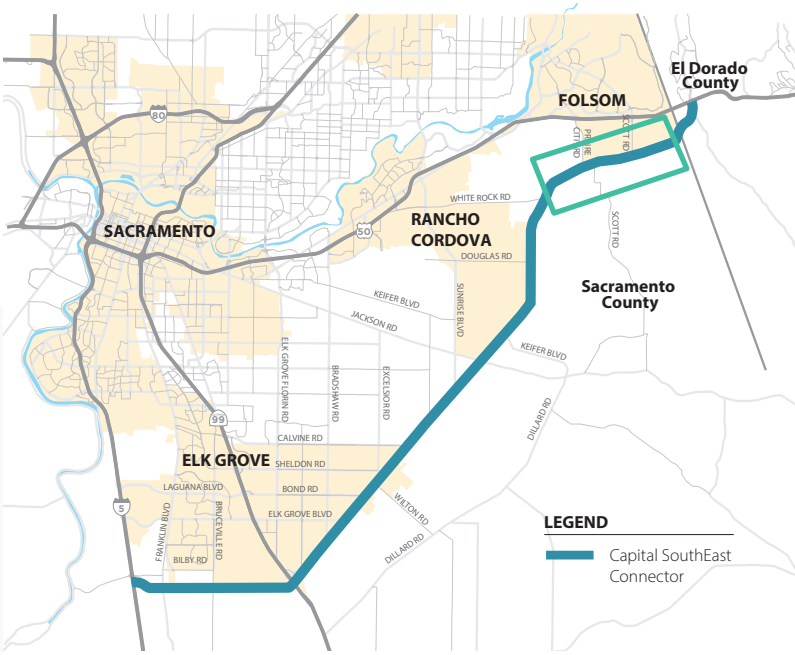
D3: WHITE ROCK ROAD TO SACRAMENTO COUNTY LINE/EL DORADO COUNTY LINE

LENGTH: 6.24 miles

JURISDICTION: City of Folsom, Sacramento County, and El Dorado County

INTENT: Provide a modern expressway with access control and grade-separated interchanges or intersections

STATUS: NEPA complete, construction started on a portion of the segment (Prairie City Road to Bidwell Street) in April 2021 and will be completed in the fall of 2022.



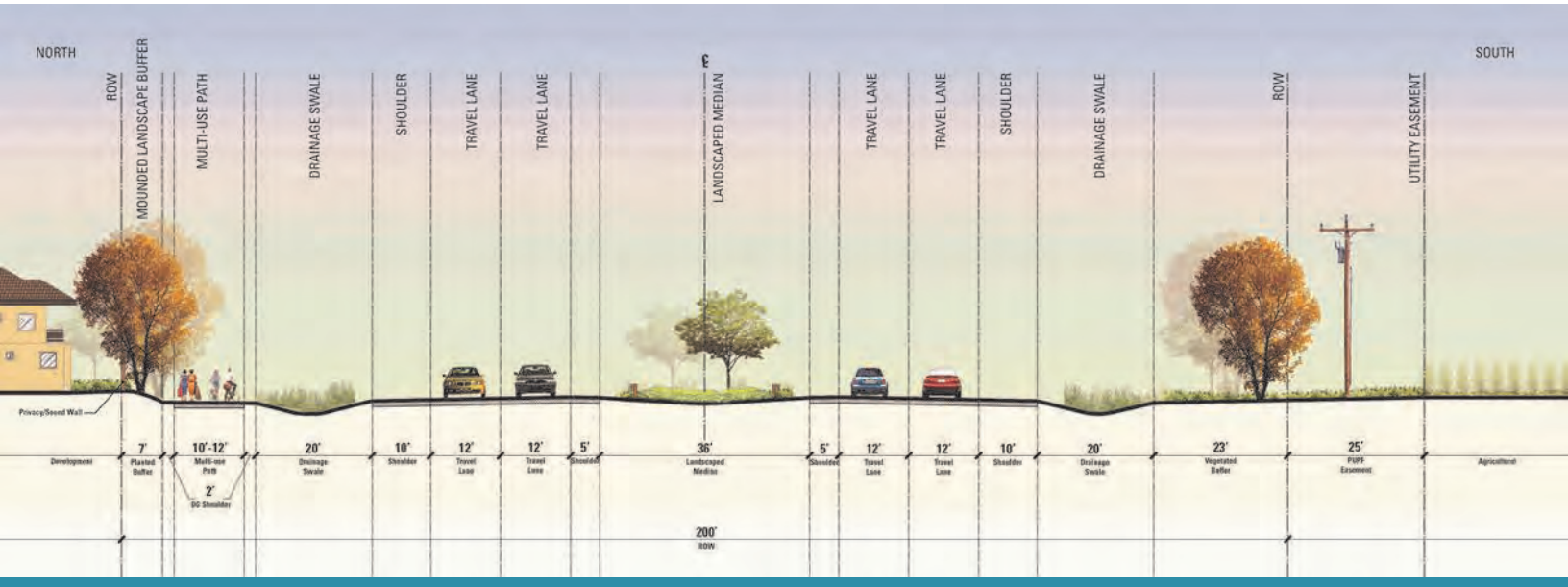
EXISTING CORRIDOR INCLUDES:

- One signalized intersection
- Full access at residential driveways along the corridor
- East of Prairie City Road, two travel lanes with minimal to no shoulders
- Substandard horizontal curves
- At-grade uncontrolled rail crossing

FUTURE CORRIDOR INCLUDES:

- Near-term signal improvements at Prairie City Road
- Near-term signal installation at Oak Avenue Parkway and Bidwell Street
- Future grade-separated interchanges at Prairie City Road, Bidwell Street, and Empire Ranch Road
- Limited access points
- Separated multi-use path
- Four travel lanes, wider shoulders, landscape median
- Smart Corridor elements
- Roadway lighting at intersections
- Grade-separated railroad crossing

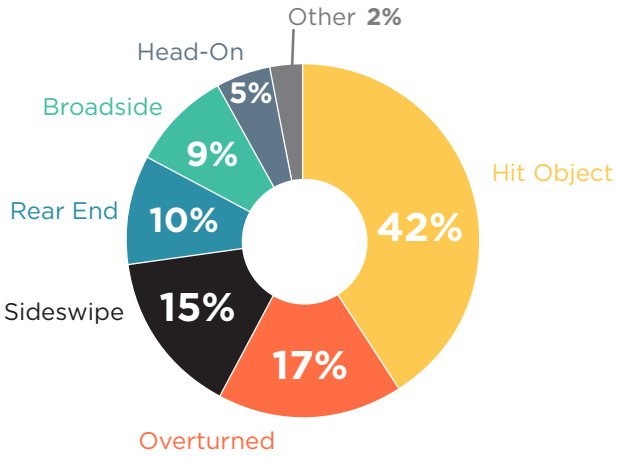
FUTURE CROSS SECTION:



CRASH DATA SUMMARY

D3: WHITE ROCK ROAD TO SACRAMENTO COUNTY LINE/EL DORADO COUNTY LINE

CRASH TYPE

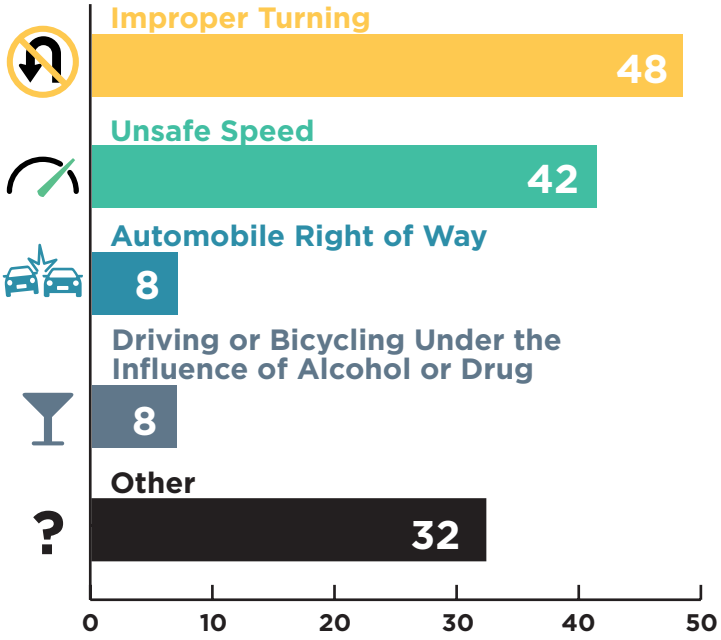


SIDESWIPE
15%

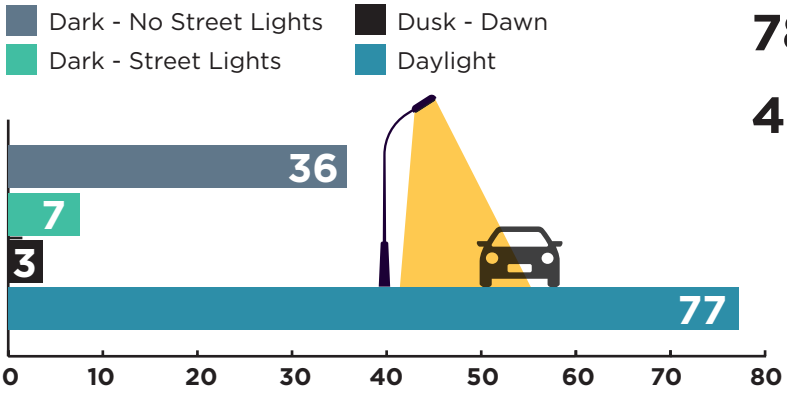
OVERTURNED
17%

HIT OBJECT
42%

CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

78 SEGMENT CRASHES

45 INTERSECTION CRASHES

CRASHES BY YEAR AND SEVERITY

Year	Fatal	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	-	1	11	17	29
2017	1	-	8	13	22
2018	1	1	16	13	31
2019	1	-	7	15	23
2020	-	2	4	7	13
Total	3	4	47	69	123

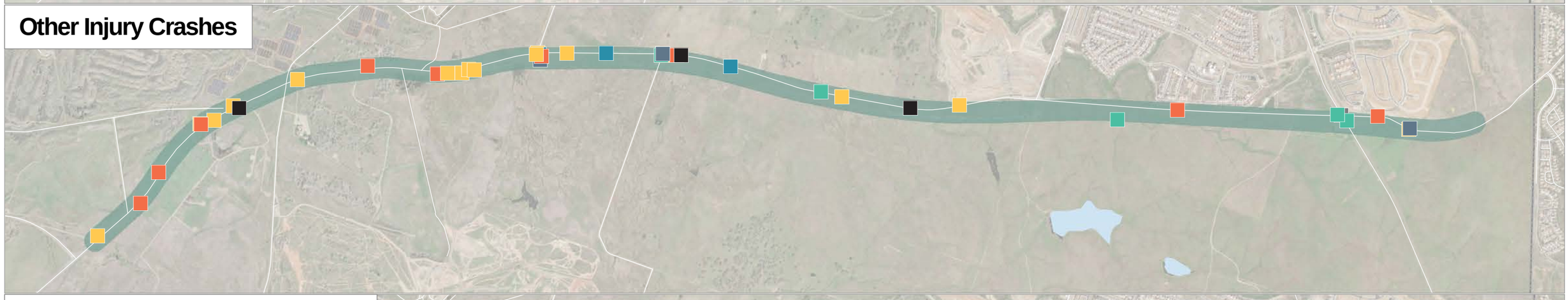
OTHER STATS TO HIGHLIGHT

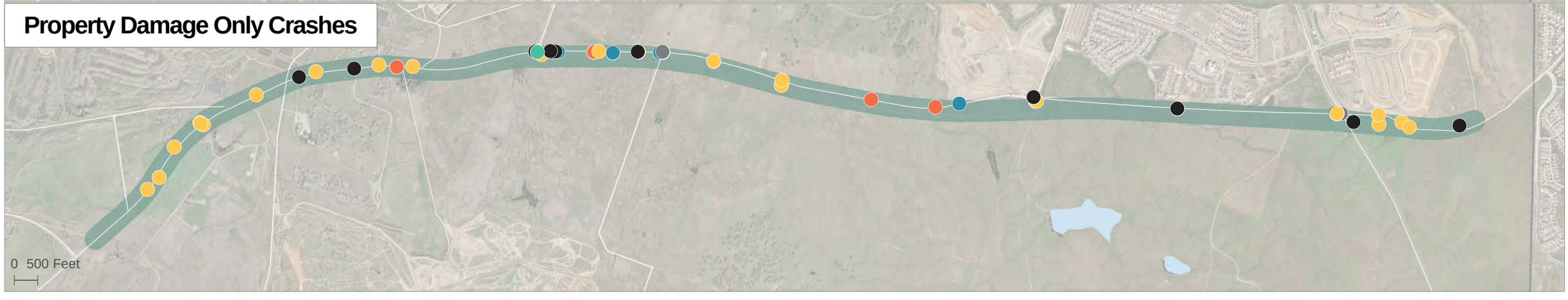
3 FATAL CRASHES

4 SERIOUS INJURY CRASHES

123 TOTAL CRASHES

Data Source: SWITRS, Crossroads (Jan 1, 2016-Dec 31, 2020)





Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

D3: WHITE ROCK TO EL DORADO
CRASH TYPE AND SEVERITY (2016-2020)

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

PLANNED SAFETY IMPROVEMENTS

The Connector Project specifically targets the crash types currently happening on the corridor, transforming the existing two-lane section with narrow shoulders and roadside obstructions into a four-lane multimodal facility with a landscape median and wide outside shoulders. The Connector project's performance-based design approach will bring the corridor up to the latest design standards. Specific elements anticipated to improve the corridor's safety performance are shown below.

ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
Landscape median	36' wide landscaped median	25% - Crashes within limits of new median	6 head-on crashes	2 crashes
Shoulder widening	5' inner shoulders, 10' outer shoulders	30% - Crashes within limits of new paved shoulder	52 fixed object crashes 16 sideswipe crashes	22 crashes
Clear recovery zone	20' feet or more of drainage swale/vegetated buffer	35% - Crashes in new clear recovery zone	52 fixed object crashes	20 crashes
Multi-use path	10-12' multi-use path separated from roadway	80% - Pedestrian and bicycle crashes	0 pedestrian crash or bicycle crashes	0 crashes[3]
Reduced horizontal curvature	Bring existing horizontal curves up to standards based on roadway character and design speed	50% - Crashes within horizontal curve	10 crashes	5 crashes
Lighting	Lighting at interchanges and intersections	40% - Night crashes at intersections	8 intersection crashes in dark conditions with no street lights	3 crashes

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
3 Multi-use path likely to induce demand and provide a safer environment for future users

**Potential crash reductions is over 5 year period*

TOTAL POTENTIAL REDUCTION OVER 5 YEARS = **38 CRASHES**

(BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.)

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

- **BACKBONE COMMUNICATIONS**
- **VEHICLE DETECTION**
- **CLOSED-CIRCUIT TELEVISION CAMERAS**
- **CHANGEABLE MESSAGE SIGNS**

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

KEY SAFETY IMPROVEMENTS:

Improved roadway alignment: The segment includes substandard horizontal and vertical curves, notably around Oak Avenue Parkway and Bidwell Street. Seven crashes were reported along horizontal curves near these intersections, including three serious injury crash and one other injury crash. The Connector Project brings the roadway alignment up to current standards with horizontal and vertical curves consistent with the roadway character and design speed.

Near-term intersection improvements: Current construction on the segment includes improvements at the intersection of Prairie City Road, including realigning Scott Road to create a single four-way, signalized intersection. Twenty crashes were reported at these two intersections. Three fatal crashes were reported around the existing intersection of Prairie City Road, including a head-on, hit object, and overturned crash. As part of current construction, the intersection at Oak Avenue Parkway is being signalized and the intersection at Bidwell Street is being signalized and realigned to improve the alignment on White Rock Road.

Grade-separated interchanges: In the long-term, the existing intersections of Prairie City Road and Bidwell Street will be converted to grade-separated interchanges. The interchanges will be designed to maximize efficiency and safety, using current best practices. In addition, a grade-separated interchange will be developed southwest of Carson Crossing Road at Empire Ranch Road.

Limited access points: Where possible, access locations will be consolidated or removed, which reduces potential conflict points and minimizes variations in speeds associated with turning movements along the corridor. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

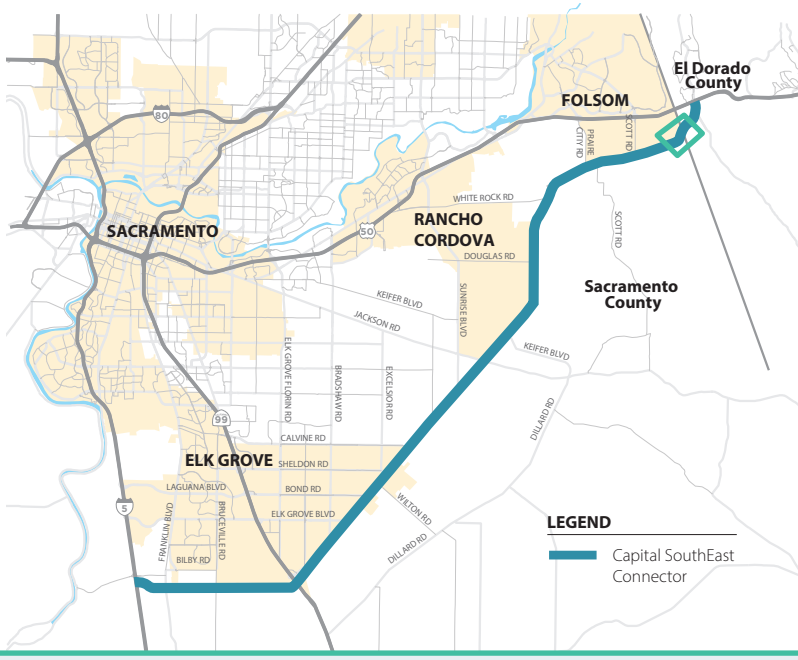
E1: SACRAMENTO COUNTY LINE/EL DORADO COUNTY LINE TO LATROBE ROAD

LENGTH: 1.3 miles

JURISDICTION: El Dorado County

INTENT: Provide a thoroughfare that accommodates planned development yet limits access and cross-street connections

STATUS: NEPA and design for near-term improvements complete



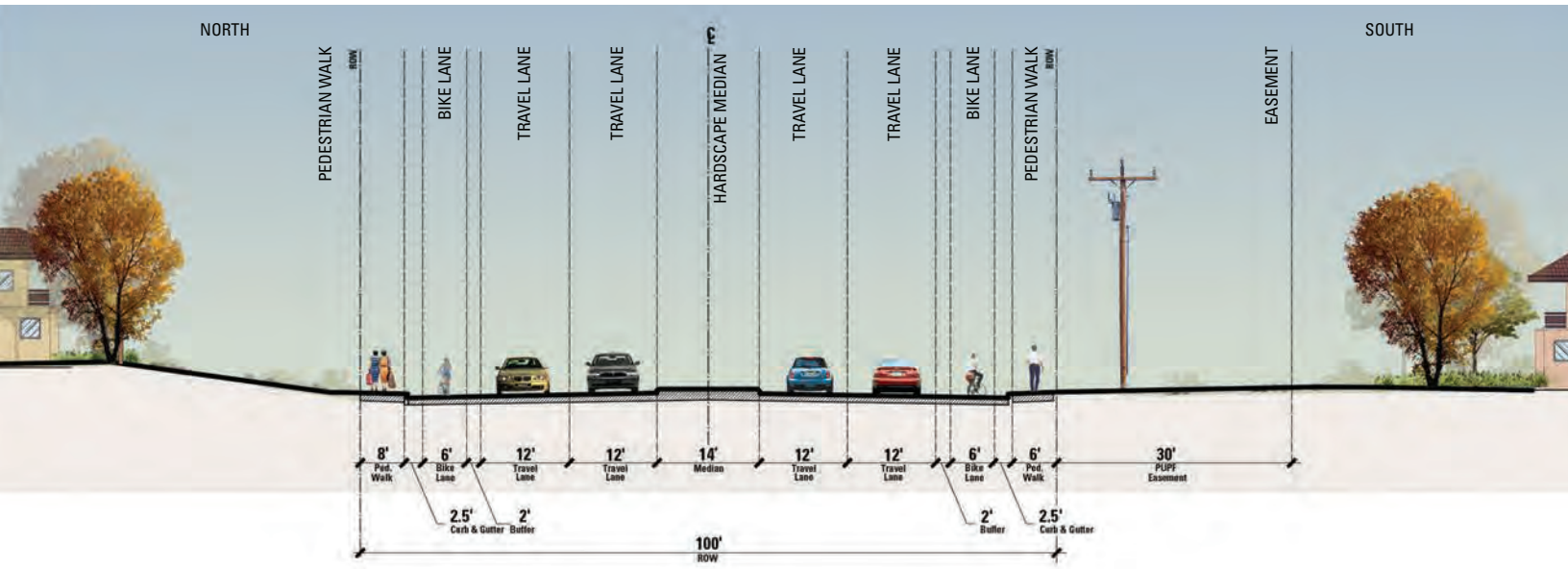
EXISTING CORRIDOR INCLUDES:

- Two signalized intersections
- Full access at cross-streets along the corridor
- Two to four travel lanes
- Bicycle lanes north of Carson Crossing Road
- Sidewalks on portions of the segment

FUTURE CORRIDOR INCLUDES:

- Near-term traffic signals at Carson Crossing Road and Manchester Drive
- Near-term signal improvements at Stonebriar Drive and Windfield Way
- Buffered bicycle lanes
- Consistent sidewalks
- Four 12-foot travel lanes and hardscape median
- Raised median at intersections to separate traffic in opposite directions
- Access restrictions for cross-streets
- Smart Corridor elements
- Roadway lighting at intersections
- Relocation of utilities to public utilities easement past sidewalk

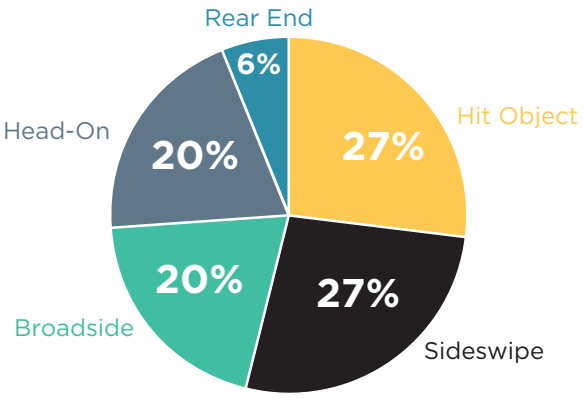
FUTURE CROSS SECTION:



CRASH DATA SUMMARY

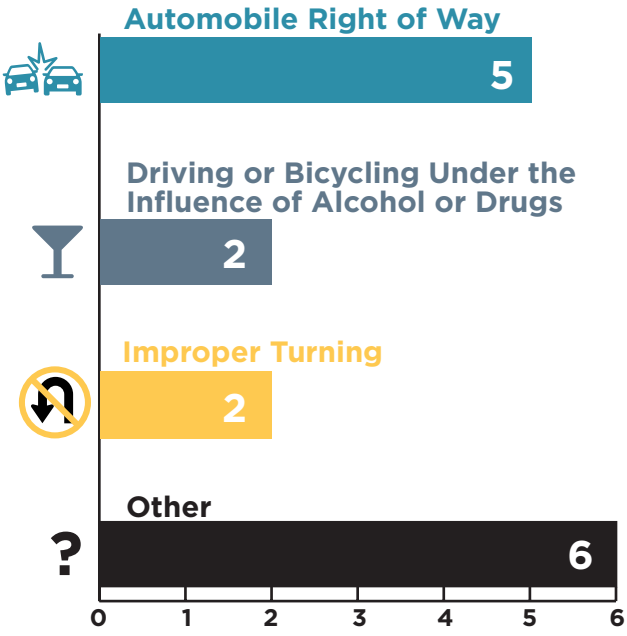
E1: SACRAMENTO COUNTY LINE/EL DORADO COUNTY LINE TO LATROBE ROAD

CRASH TYPE

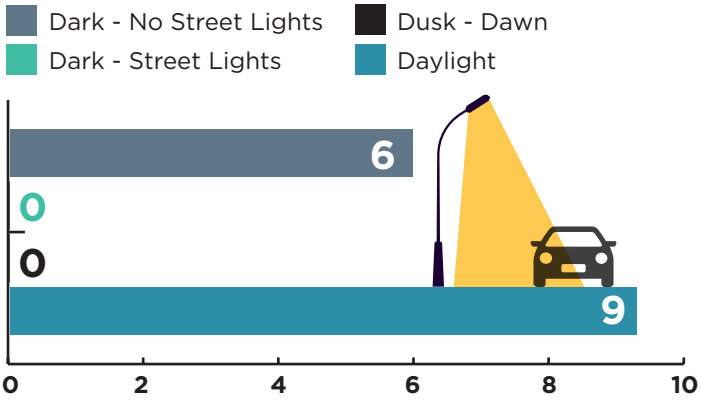


HEAD-ON	BROADSIDE	SIDESWIPE	HIT OBJECT
20%	20%	27%	27%

CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

7 SEGMENT CRASHES

8 INTERSECTION CRASHES

CRASHES BY YEAR AND SEVERITY

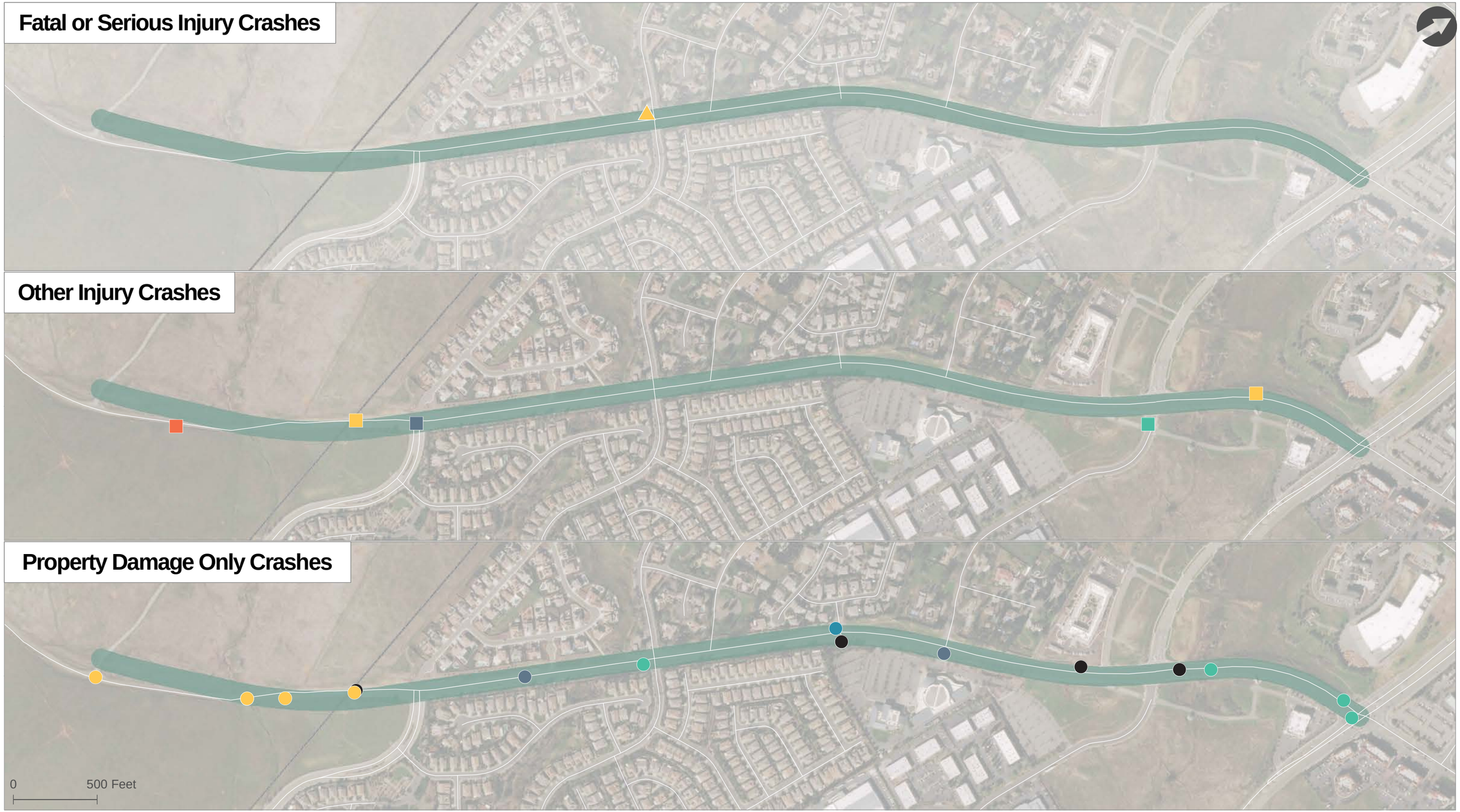
Year	Fatal	Other Injury Crashes	Property Damage Only	Total
2016	1	1	4	6
2017	-	-	4	4
2018	-	1	1	2
2019	-	2	-	2
2020	-	-	1	1
Total	1	4	10	15

OTHER STATS TO HIGHLIGHT

1 FATAL CRASH

15 TOTAL CRASHES

Data Source: SWITRS, Crossroads (Jan 1, 2016-Dec 31, 2020)



Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

E1: EL DORADO TO LATROBE
CRASH TYPE AND SEVERITY (2016-2020)

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

PLANNED SAFETY IMPROVEMENTS

The Connector Project specifically targets the crash types currently occurring on the corridor, transforming the existing two- to four-lane section with inconsistent pedestrian and bicycle facilities into a four-lane multimodal facility, with limited access locations. South of Carson Crossing Road, the Connector includes wider shoulders, clear recovery zone, multi-use path, and landscape median. The Connector transitions to a thoroughfare at El Dorado Hills, providing a hardscape median, buffered bicycle lanes, and sidewalks. The Connector Project presents the opportunity to utilize a **performance-based design approach** and bring the corridor up to the **latest design standards**. Specific elements of the Connector Project anticipated to improve the corridor's safety performance are shown below.

	ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
South of Carson Crossing Road	Landscape median	36' wide landscaped median	25% - Crashes within limits of new median	0 head-on crashes	0 crashes
	Shoulder widening	5' inner shoulders, 10' outer shoulders	30% - Crashes within limits of new paved shoulder	2 fixed object crashes 1 sideswipe crashes	<1 crash
	Clear recovery zone	20' feet or more of drainage swale/vegetated buffer	35% - Crashes in new clear recovery zone	2 fixed object crashes	<1 crash
	Multi-use path	10-12' multi-use path separated from roadway	80% - Pedestrian and bicycle crashes	0 pedestrian crashes or bicycle crashes	0 crashes[3]
North of Carson Crossing Road	Hardscape median	14' wide hardscape median	25% - Crashes within limits of new median	0 head-on crashes	0 crash
	Raised median on intersection approaches	Where left-turn lanes are provided, a 2' raised median separates turning traffic from oncoming traffic	25% - Crashes on approach	6 crashes at existing or future signalized intersections	2 crashes
	Buffered bicycle lanes	6' bicycle lane with 2' buffer	45%- Pedestrian and bicycle crashes	0 pedestrian crashes or bicycle crashes	0 crashes[3]
	Sidewalks	6' sidewalks	80% - Pedestrian and bicycle crashes	0 pedestrian crashes or bicycle crashes	0 crashes[3]
	Lighting	Lighting at interchanges and intersections	40% - Night crashes at intersections	1 intersection crash in dark conditions with no street lights	<1 crash

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
3 Multi-use path, buffered bicycle lanes, and sidewalks likely to induce demand and provide a safer environment for future users
**Potential crash reductions is over 5 year period*

TOTAL POTENTIAL REDUCTION OVER 5 YEARS = **3 CRASHES** (BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

BACKBONE COMMUNICATIONS

VEHICLE DETECTION

CLOSED-CIRCUIT TELEVISION CAMERAS

CHANGEABLE MESSAGE SIGNS

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

KEY SAFETY IMPROVEMENTS:

Continuous buffered bicycle lanes and sidewalks: The segment currently provides bicycle lanes north of Carson Crossing Road and sidewalks along portions of the segment. The Connector Project provides buffered bicycle lanes and continuous sidewalks, which will connect to the multi-use path planned south of the segment in the future. Intersection improvements also provide additional crossing opportunities on White Rock Road.

Near-term intersection improvements: Planned construction on the segment includes signalization of Carson Crossing Road and White Rock Road, which will facilitate pedestrian crossings of White Rock Road and turning movements to and from White Rock Road.

Limited access points: Where possible, access locations will be consolidated or removed, which reduces potential conflict points and minimizes variations in speeds associated with turning movements along the corridor. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

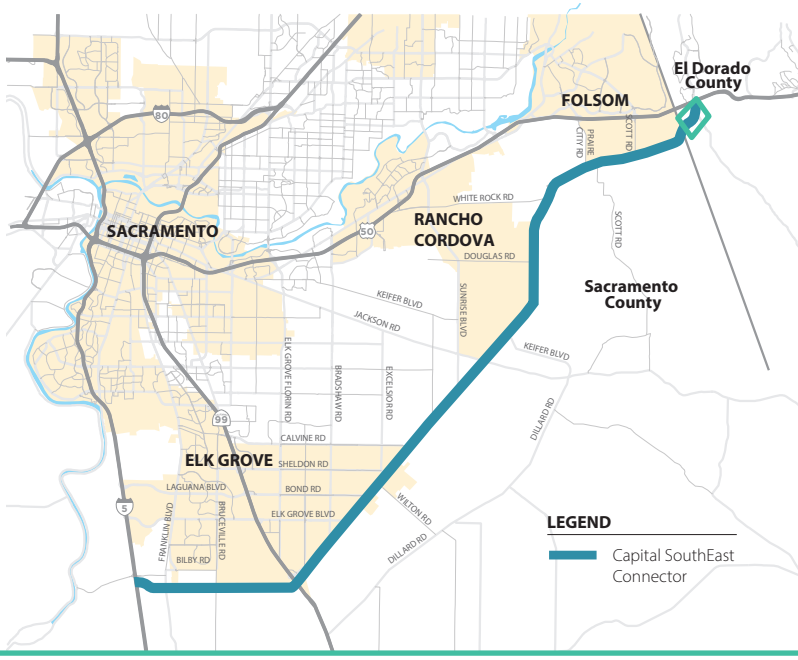
E2: LATROBE ROAD TO US 50

LENGTH: 0.9 miles

JURISDICTION: El Dorado County

INTENT: Provide a thoroughfare that accommodates planned development yet limits access and cross-street connections

STATUS: NEPA scheduled to begin in 2025



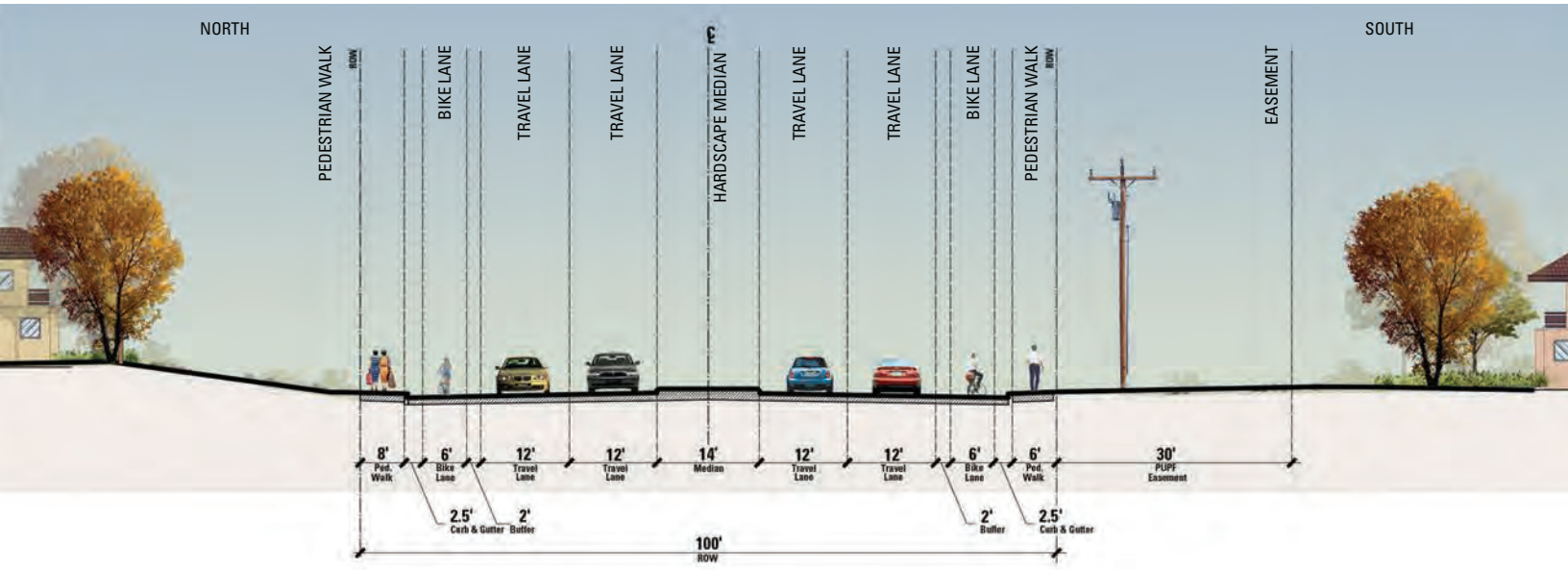
EXISTING CORRIDOR INCLUDES:

- Five signalized intersections
- Full access at cross-streets along the corridor
- Two to four travel lanes
- Bicycle lanes
- Sidewalks on portions of the segment

FUTURE CORRIDOR INCLUDES:

- Buffered bicycle lanes
- Consistent sidewalks
- Four 12-foot travel lanes and hardscape median
- Raised median at intersections to separate traffic in opposite directions
- Access restrictions for cross-streets
- Smart Corridor elements
- Roadway lighting at intersections
- Relocation of utilities to public utilities easement past sidewalk

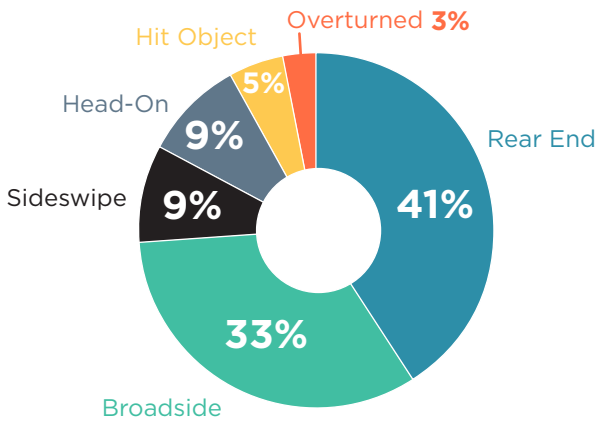
FUTURE CROSS SECTION:



CRASH DATA SUMMARY

E2: LATROBE ROAD
TO US 50

CRASH TYPE



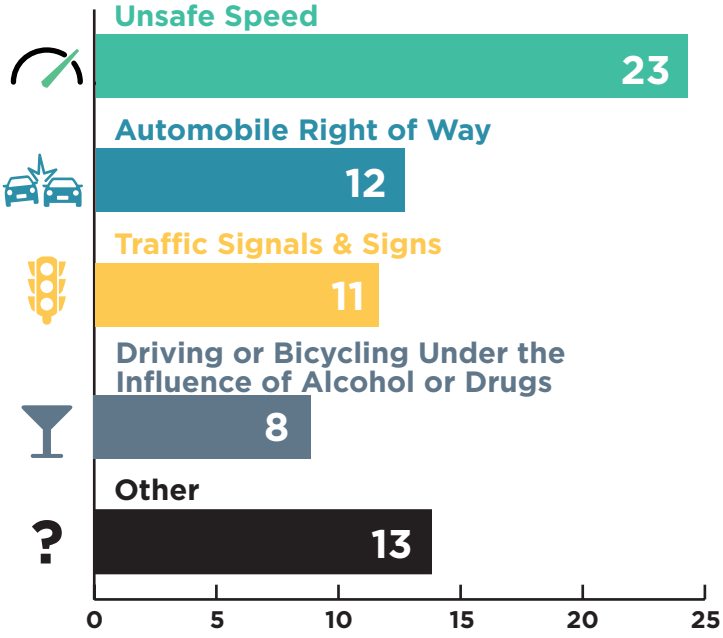
HEAD-ON 9%

SIDESWIPE 9%

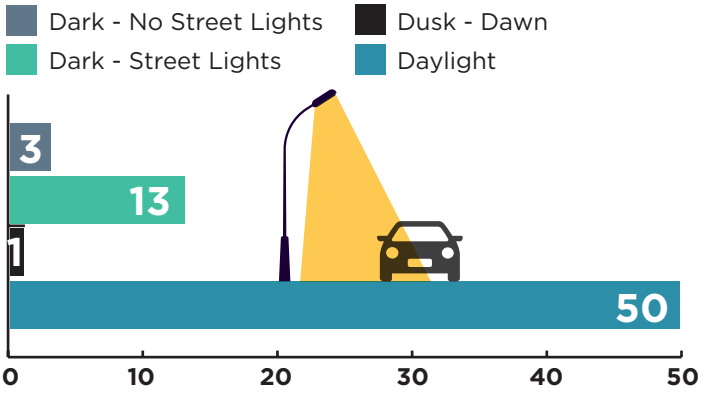
BROADSIDE 33%

REAR END 41%

CRASHES BY PRIMARY COLLISION FACTOR



LIGHTING



LOCATION

5 SEGMENT CRASHES

62 INTERSECTION CRASHES

CRASHES BY YEAR AND SEVERITY

Year	Serious Injury	Other Injury Crashes	Property Damage Only	Total
2016	-	2	9	11
2017	-	7	10	17
2018	-	5	8	13
2019	2	3	9	14
2020	-	4	8	12
Total	2	21	44	67

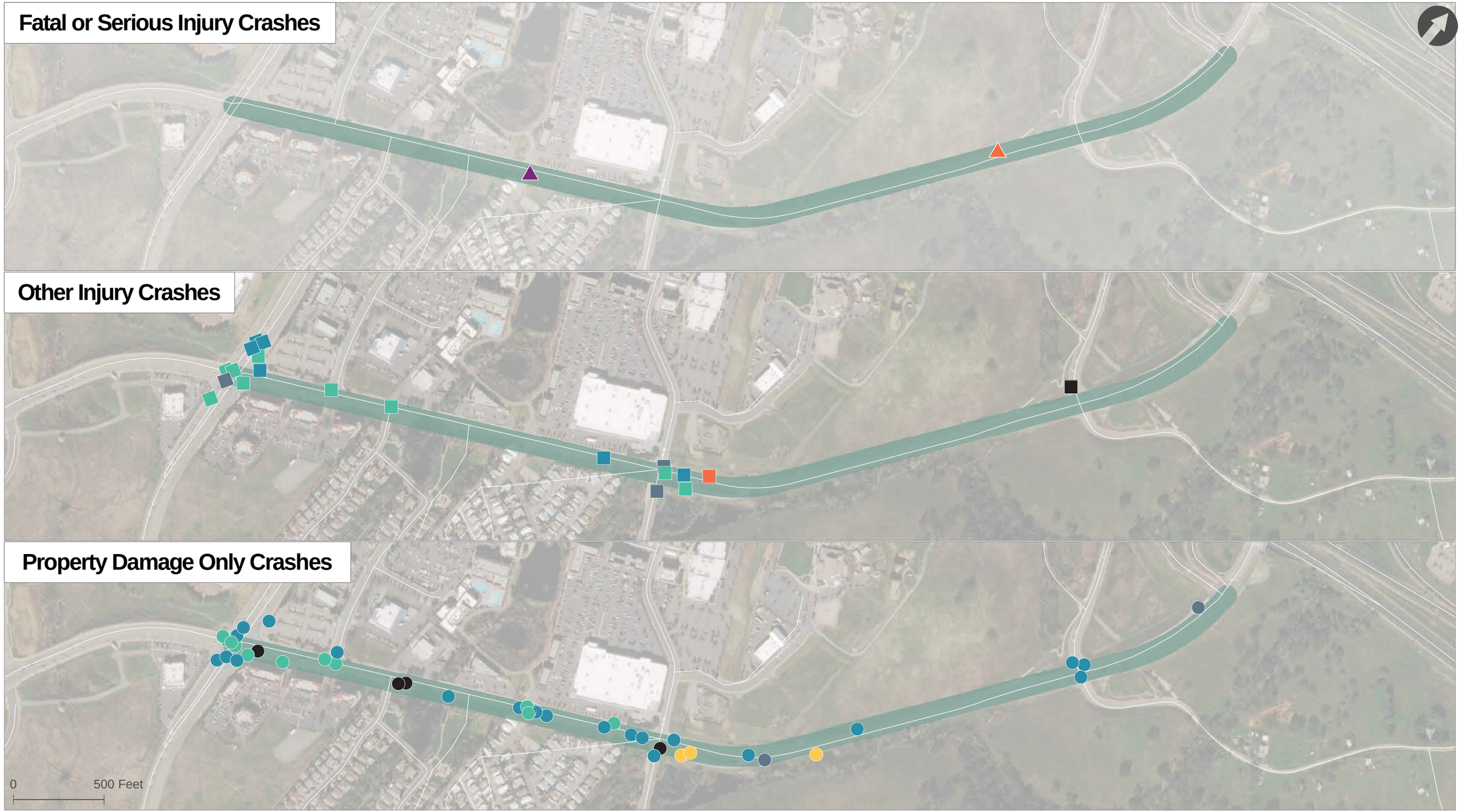
OTHER STATS TO HIGHLIGHT

1 PEDESTRIAN CRASH (SERIOUS INJURY)

1 BICYCLIST CRASH (SERIOUS INJURY)

67 TOTAL CRASHES

Data Source: SWITRS, Crossroads (Jan 1, 2016-Dec 31, 2020)



Crash Type

- Rear End Crash
- Hit Object Crash
- Broadside Crash
- Head-On Crash
- Sideswipe Crash
- Overturned Crash
- Vehicle/Pedestrian Crash
- Other Crash Type

Crash Severity

- Fatal/Serious Injury Crash
- Other Injury Crash
- Property Damage Only Crash
- Connector Segment

Coordinate System: NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Data Source: SWITRS, Crossroads

E2: LATROBE TO US-50
CRASH TYPE AND SEVERITY (2016-2020)

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PLANNED SAFETY IMPROVEMENTS

The Connector Project specifically targets the crash types currently occurring on the corridor, transforming the existing two- to four-lane section with inconsistent pedestrian facilities into a four-lane multimodal facility, with limited access locations. The Connector is a thoroughfare through El Dorado Hills, providing a hardscape median, buffered bicycle lanes, and sidewalks. The Connector Project presents the opportunity to utilize a **performance-based design approach** and bring the corridor up to the **latest design standards**. Specific elements of the Connector Project anticipated to improve the corridor's safety performance are shown below.

ELEMENT	DETAILS	CRF[1]	CRASHES ADDRESSED[2]	POTENTIAL CRASH REDUCTION*
Hardscape median	14' wide hardscape median	25% - Crashes within limits of new median	1 head-on crash	<1 crash
Raised median on intersection approaches	Where left-turn lanes are provided, a 2' raised median separates turning traffic from oncoming traffic	25% - Crashes on approach	42 crashes at existing signalized intersections	11 crashes
Buffered bicycle lanes	6' bicycle lane with 2' buffer	45%- Bicycle crashes	1 bicycle crash	<1 crash
Sidewalks	6' sidewalks	80% - Pedestrian crashes	1 pedestrian crash	1 crash

1 Crash Reduction Factor, Local Roadway Safety: A Manual for California's Local Road Owners
2 Based on Local Roadway Safety: A Manual for California's Local Road Owners
**Potential crash reductions is over 5 year period*

TOTAL POTENTIAL REDUCTION OVER 5 YEARS = 12 CRASHES

(BASED ON RECOMMENDED APPROACH IN THE HIGHWAY SAFETY MANUAL FOR COMBINING THE EFFECTS OF MULTIPLE SAFETY IMPROVEMENTS TO ACCOUNT FOR CORRELATION.)

The Connector will be a smart corridor, implementing established Intelligent Transportation Systems infrastructure and providing the opportunity to test emerging transportation technologies.

- **BACKBONE COMMUNICATIONS**
- **VEHICLE DETECTION**
- **CLOSED-CIRCUIT TELEVISION CAMERAS**
- **CHANGEABLE MESSAGE SIGNS**

ITS Infrastructure helps improve safety by:

- Enabling faster incident response times
- Gathering more data on the corridor's performance that can help target improvements
- Providing data to refine traffic signal timing to reduce red-light running and congestion-related incidents
- Sharing real-time traffic data with the public about incidents, advisory speeds, road work, weather conditions, and more

KEY SAFETY IMPROVEMENTS:

Continuous buffered bicycle lanes and sidewalks: The segment currently provides bicycle lanes and sidewalks along portions of the segment. The Connector Project provides buffered bicycle lanes and continuous sidewalks, which will connect to the multi-use path planned south of the segment in the future.

Corridor continuity and hardscape median: The corridor currently varies between two and four travel lanes, with a painted median or two-way left-turn lane. The Connector Project provides a continuous four-lane section, with turn lanes at intersections, where appropriate, and a raised center median.

Signalized intersection improvements: ITS infrastructure will be enhanced at signalized intersections, and raised medians provided between left-turns and opposing through traffic.

Limited access points: Where possible, access locations will be consolidated or removed, which reduces potential conflict points and minimizes variations in speeds associated with turning movements along the corridor. Access management is a key principle in reducing crashes and improving safety performance along a corridor. Research in the Transportation Research Board *Access Management Manual* notes that "As access density increases, crash rates increase."

ITEM 11

MEETING DATE: May 27, 2022

TITLE: Update on the Transportation Equity and Environmental Justice Benefits of the Connector Project (Receive and File)

PREPARED BY: Matt Lampa

RECOMMENDATION

Receive an update on transportation equity benefits related to the Connector project.

BACKGROUND

Staff has been working with Kittelson & Associates, Inc. ("Kittelson") to analyze how the Connector project aligns with federal, state, and regional goals to provide benefits related to "transportation equity". Addressing equity and environmental justice has become an important criterion for transportation projects.

The analysis utilizes federal, state, and regional resources to define "equity" within the context of transportation projects. The analysis also reviewed mapping of historically disadvantaged communities throughout the region and quantifies benefits associated with environmental justice.

Transportation equity is a focus on how project elements can more adequately address the needs of disadvantaged and under-served communities that have historically experienced fewer benefits and a greater share of negative impact associated with the transportation system.

EXECUTIVE SUMMARY

The Connector project supports an equitable transportation system in the greater Sacramento region by avoiding direct impacts to areas with disadvantaged communities and vulnerable populations.

The project provides indirect benefits to the same areas through improved air quality, improved mobility, and increased multimodal transportation options. Further, the project improves connections between rural and tribal communities and the economic centers of the region.

DISCUSSION

Kittelson & Associates, Inc. reviewed various federal, state, and regional policies, executive orders, and other resources to establish a baseline understanding of equity related to transportation and the Connector project.

The results reflect that the Connector alignment does not pass through any disadvantaged communities and the project does not have any direct impact on these communities.

The Connector aligns with regional plans and state and federal guidelines regarding the project's anticipated benefits related to equity, mobility, quality of life, and economic opportunity. In particular, it supports Caltrans' Equity Statement through its workforce development and procurement practices, meaningful engagement with communities, and contributes to reducing greenhouse gas emissions and other air toxins.

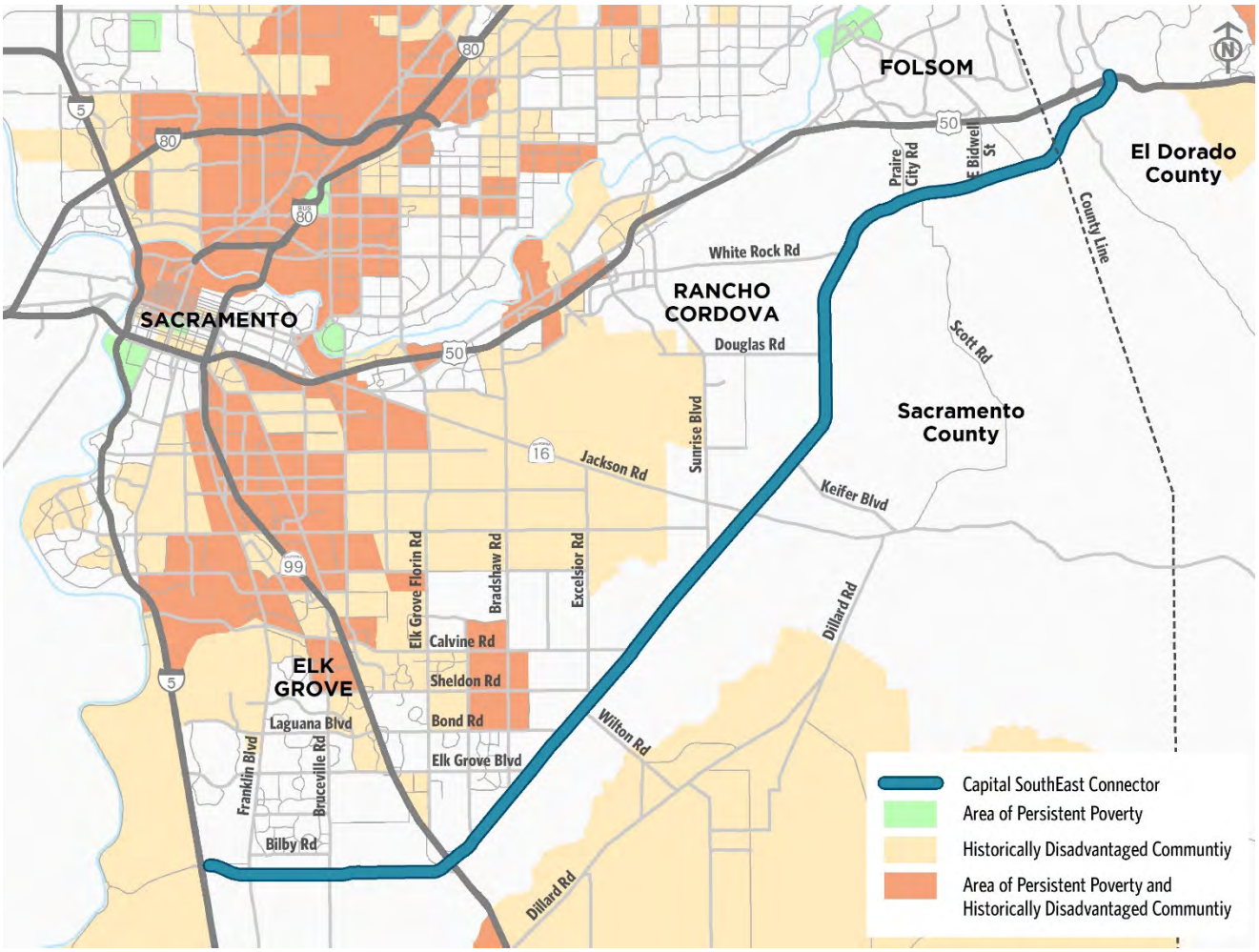

Figure 1: Areas of Persistent Poverty and Historically Disadvantaged Communities

SUMMARY

The analysis from Kittelson documents that the Connector supports an equitable transportation system. Specifically the Connector provides the following benefits related to equity and disadvantaged communities:

- The Connector Supports equitable job opportunities through:
  - Supporting local workforce development, hiring, and training opportunities.
  - Providing contracting opportunities for Disadvantaged Businesses Enterprises ("DBE") by setting DBE contract goals.

- The Connector decreases vehicle miles traveled on the State Highway System (State Routes 50 and 99, and Interstate 5) where disadvantaged communities are concentrated, and supports reduced air quality and noise impacts borne by those disadvantaged communities.

- The Connector provides improved connections between rural and tribal communities and the region's economic centers by providing a high-quality route that increases connectivity, accessibility, and mobility for rural communities.

- The Connector reduces barriers for rural, disadvantaged, and developing communities by creating new connections to job centers and increasing access and mobility for rural communities. This is accomplished by improving non-motorized and transit opportunities through increased transit connections and the development of a multi-use path along the majority of the 34-mile length of the Connector.

ATTACHMENTS

a. Key Takeaways
b. Equity Analysis Memorandum, dated May 2022

EQUITY ANALYSIS

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Connecting Communities

WHAT IS EQUITY?

Equity from a transportation perspective includes:

"We will achieve equity when everyone has access to what they need to thrive — starting with our most vulnerable — no matter their race, socioeconomic status, identity, where they live, or how they travel. "

– Caltrans Equity Statement

"Identifying and addressing disproportionately high and adverse human health or environmental effects" of projects, program, policies, or actions on minority and low-income populations.

– Executive Order 12898

Improving connections to underserved communities to reduce barriers to opportunity and increase access to "job opportunities, quality education, and healthy food."

– FHWA Climbing the Ladders of Opportunity

HOW ARE DISADVANTAGED COMMUNITIES DEFINED?

Federal, state, and regional tools consider a variety of factors to define and map disadvantaged communities. Common considerations include:

- Environmental and exposure indicators like ozone levels, traffic proximity, exposure to toxins, and wastewater discharge
- Socioeconomic and demographic indicators, like race, poverty, and unemployment

HOW DOES THE CONNECTOR PROJECT BENEFIT EQUITY?

Although the Connector project does not overlap with disadvantaged communities as defined at a federal, state, or regional level, the project benefits disadvantaged communities in the following ways:

Decreasing vehicle miles traveled along the State Highway System, including State Route 99 (SR 99), resulting in associated improvements in air quality. Disadvantaged communities are located along SR 99 south of Sacramento.

Reducing barriers for rural, disadvantaged, and developing communities and providing connections to jobs and housing while preserving habitat and farmland.

Supporting equitable job opportunities as part of the implementation of the Connector by supporting disadvantaged business enterprises.

Utilizing inclusive community engagement including outreach to local tribes, rural communities, and agricultural workers.

Improving opportunities for **walking**, **biking**, and access to transit along the corridor with a Class I multi-use path and pedestrian facilities along most of the Connector.

ITEM 11 b

KITTELSON & ASSOCIATES

2510 J Street, Suite 200
Sacramento, CA 95816
P 916.266.2190

MEMORANDUM: Equity Analysis

May 20, 2022 Project #: 27098

To: Matt Lampa, PE, Principal Civil Engineer
Capital SouthEast Connector JPA
10640 Mather Blvd., Suite 120
Mather, CA 95655

CC: Derek Minnema, PE, Executive Director

From: Matt Braughton, RSP; Kelly Lausten; Mike Aronson, PE; and Allison Woodworth
Kittelson & Associates, Inc.

RE: Connector Project Performance Benefits Study – Equity Analysis

Executive Summary

Equity in transportation acknowledges that "communities of color and other under-served communities have experienced fewer benefits and a greater share of negative impacts associated with our… transportation system."[1] As our awareness of these disproportionate benefits and impacts has increased, addressing these historic inequities and preventing future impacts has become important criteria for transportation projects. The Capital SouthEast Connector (Connector) helps support an equitable transportation system in the greater Sacramento region by **avoiding impacts to disadvantaged communities and vulnerable populations**. The Connector also provides the following equity benefits:

- **Decreasing vehicle miles traveled along the State Highway System** supporting reduced air quality and noise impacts borne by the disadvantaged communities along State Routes 50 and 99, and Interstate 5.
- **Reducing barriers for rural, disadvantaged, and developing communities** by creating new connections to job centers, and increasing access and mobility for rural communities.
- **Supporting equitable job opportunities** through local hiring and training opportunities, and disadvantaged business goals for Connector projects.
- **Utilizing inclusive community engagement** to reach tribes, agricultural businesses and workers, and other community groups along the corridor.
- **Improving non-motorized and transit opportunities** through increased transit connections and the development of a multi-use path along the majority of the 34-mile length of the Connector.

This memorandum summarizes equity benefits from the Connector and is organized into the following sections:

I. Key Takeaways
II. Project Background
III. What is Equity?
IV. How are Disadvantaged Communities Defined?
V. Alignment with Equity Plans
VI. Project Equity Impact Analysis and Benefits
VII. Conclusion

Two supplemental appendices include more detailed information on the equity framework criteria as well as job and housing growth assumptions. The following page summarizes the key takeaway from the Equity Analysis.

[1] Equity Statement, Caltrans, December 2020. https://dot.ca.gov/about-caltrans/equity-statement

EQUITY ANALYSIS

WHAT IS EQUITY?

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- Socioeconomic and demographic indicators, like race, poverty, and unemployment

HOW DOES THE CONNECTOR PROJECT BENEFIT EQUITY?

Although the Connector project does not overlap with disadvantaged communities as defined at a federal, state, or regional level, the project benefits disadvantaged communities in the following ways:

Decreasing vehicle miles traveled along the State Highway System, including State Route 99 (SR 99), resulting in associated improvements in air quality. Disadvantaged communities are located along SR 99 south of Sacramento.

Reducing barriers for rural, disadvantaged, and developing communities and providing connections to jobs and housing while preserving habitat and farmland.

Supporting equitable job opportunities as part of the implementation of the Connector by supporting disadvantaged business enterprises.

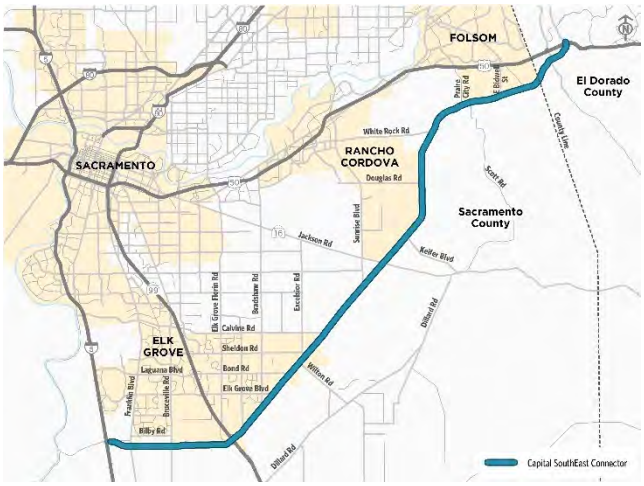
Utilizing inclusive community engagement including outreach to local tribes, rural communities, and agricultural workers.

Improving opportunities for **walking**, **biking**, and access to transit along the corridor with a Class I multi-use path and pedestrian facilities along most of the Connector.

II. Project Background

The Connector is a 34-mile multimodal facility southeast of the City of Sacramento that extends from Interstate 5 (I-5) in Elk Grove to US Highway 50 (US 50) in El Dorado County (see Figure 2). The project provides multimodal and multijurisdictional roadway improvements via new and existing infrastructure that will enhance intra and inter-community access to jobs and housing across and throughout the region. The Connector will serve as a significant regional commuter and goods movement corridor for east-west travel seeking to bypass the congested and out of direction travel on the State Highway System (SHS), particularly on I-5, State Route 99 (SR 99), and US 50

Figure 1: Connector Alignment



III. What is Equity?

Equity within the context of transportation is defined in several ways. United States Department of Transportation (USDOT) and Federal Highways Administration (FHWA)[2] have defined equity primarily through three transportation-related aspects of fairness:

1. **Transportation Equity:** The primary aim of transportation equity is to help ensure "everyone has access to what they need to thrive – starting with our most vulnerable – no matter their race, socioeconomic status, identify, where they live, or how they travel[3]."

2. **Environmental Justice:** Environmental justice focuses on "identifying and addressing disproportionately high and adverse human health or environmental effects[4]" of projects, program, policies, or actions on minority and low-income populations. Addressing these disproportionate effects targets achieving an "equitable distribution of benefits and burdens" across the community.

3. **Barriers to Opportunity:** Most recently, USDOT and FHWA have introduced racial equity and barriers to opportunity as an additional lens for considering the equity impacts of a project. The barriers to opportunity criteria focus on how projects have completed equity-focused outreach and how a project serves to improve connections to underserved communities to reduce barriers to opportunity and increase access to "job opportunities, quality education, and healthy food[5]."

These definitions were used to develop a framework for understanding the benefits to vulnerable communities in the region resulting from the Connector project. This framework utilizes common qualitative and quantitative screening criteria used by federal, state and regional agencies for planning purposes. A summary of these screening criteria is included in **Appendix A** and the criteria are further discussed in the next section. These definitions and criteria were used to evaluate the equity benefits of the Connector project, where applicable. Given that the Connector's alignment does not travel directly through most common definitions of disadvantaged communities, the benefits considered in this memorandum are often indirectly related to the Connector project.

[2] Equity Statement, Caltrans, December 2020. https://dot.ca.gov/about-caltrans/equity-statement
[3] Pursuing Equity in Pedestrian and Bicycle Planning, Pedestrian and Bicycle Information Center, March 2016.
[4] Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994)
[5] https://highways.dot.gov/public-roads/julyaugust-2016/climbing-ladders-opportunity

IV. How are Disadvantaged Communities Defined?

There are multiple ways to define disadvantaged communities, based on different ways of evaluating equity and considering fairness[6]. Often equity vocabulary and criteria are dictated by a particular agency or funding source. For consistency, this memorandum uses the term disadvantaged community. The following three screening tools were used to define the location of disadvantaged communities regionally:

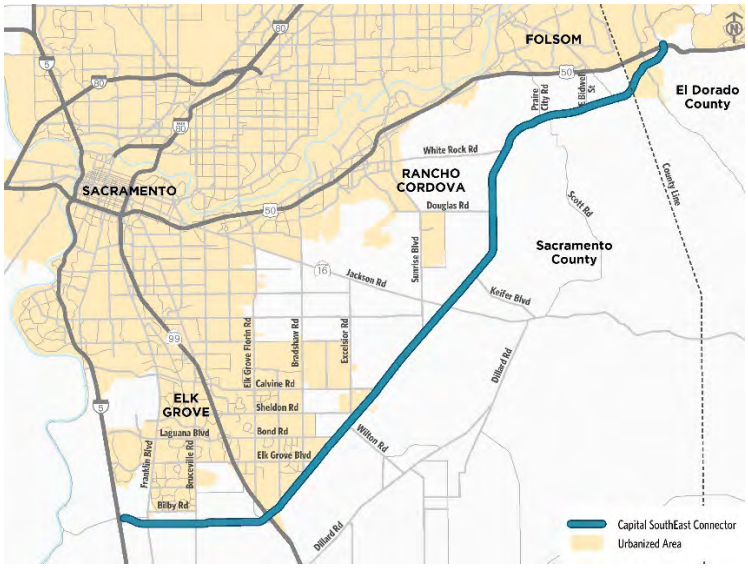
1. Rural and Urbanized Areas (Federal definition)
2. EJScreen (Federal tool) and CalEnviroScreen (State tool)
3. 2020 Sacramento Area Council of Governments (SACOG) Disadvantaged Communities (Regional tool)

Appendix A describes additional screening tools and definitions in detail with accompanying maps. Many of these are indices that use a combination of similar inputs or criteria and are further refined using local or regional data (e.g. CalEnviroScreen informs both SACOG's and Sacramento County's definition of a vulnerable community). Each of the three screening tools are discussed below.

RURAL AND URBANIZED AREAS

Addressing socioeconomic disparities and barriers to goods and services areas are often a focus of national, state, and regional planning efforts and funding programs. The Connector links the outer edge of Sacramento's southwest urbanized areas to the urbanized communities in the northeastern El Dorado County (Figure 2). As it traverses the region, the Connector is surrounded by rural areas providing an improved connection between the adjacent rural communities and the jobs and services provided in the urbanized communities. As a planned facility in the Sacramento County General plan, the Connector provides the potential for growth in some of these rural areas while also establishing conservation areas to preserve agricultural lands and natural habitat. The **Barriers to Opportunity** section below provides more detail on how the Connector project serves the developing communities identified by SACOG.

Figure 2: Urbanized Areas Map



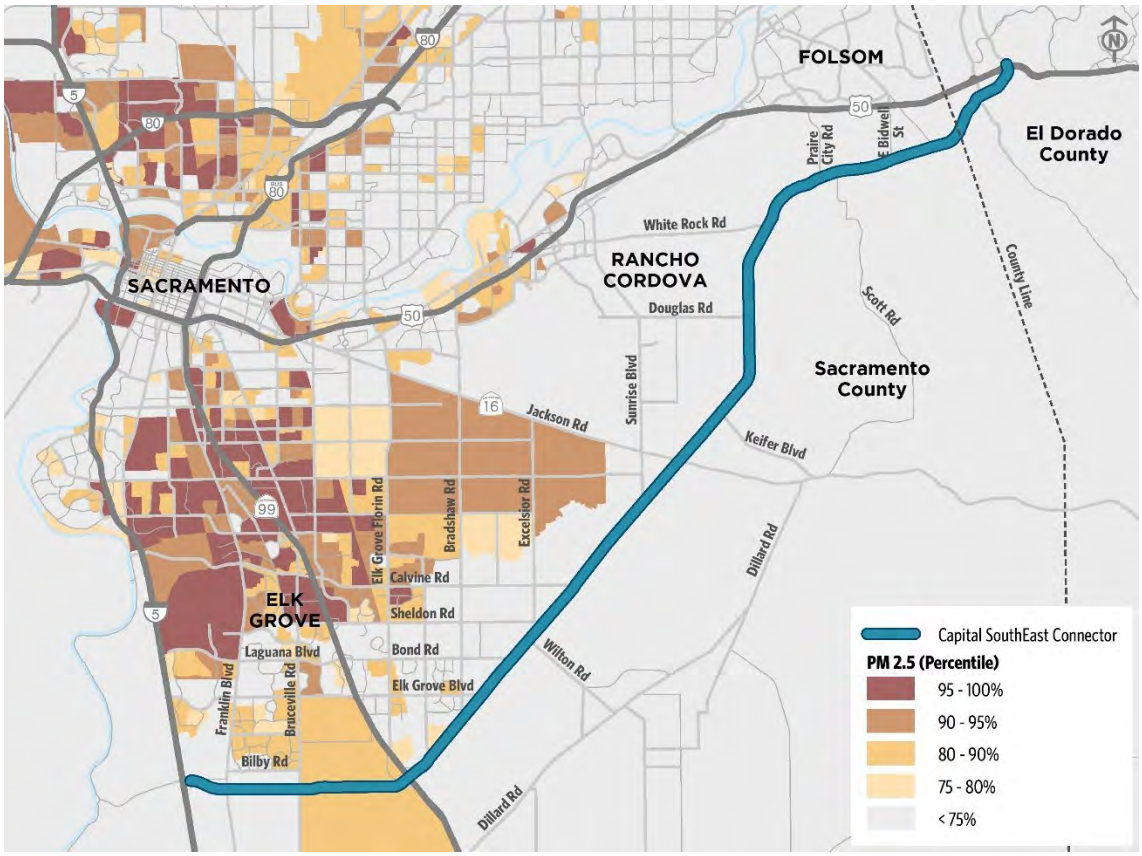
Source: US Census 2010.

[6] Terms commonly used in the profession include disadvantaged, vulnerable, underserved, under-resourced, and environmental justice (EJ) communities.

EJSCREEN AND CALENVIRONSCREEN

EJScreen is an environmental justice mapping tool developed by the Environmental Protection Agency (EPA) to create a nationally consistent measurement of community sensitivity to environmental burden or risk relative to communities within the US or a specific state. The tool contains several indices that use a combination of demographic and environmental indicators (e.g., unemployment rate, traffic proximity, diesel particulate matter) to assess relative environmental burden or risk using U.S. Census block groups. **Appendix A** includes maps for six of the EJScreen environmental indicators most relevant to transportation improvement projects. Figure 3 shows the Connector project in relationship to communities that bear increased burdens related to particulate matter 2.5 (PM 2.5). This particulate matter is a common air pollutant that originates from combustion sources – mainly motor vehicles – and is associated with adverse health outcomes. As shown, there are areas with higher levels of PM 2.5 exposure east of I-5 and both east and west of SR 99.

Figure 3: Percentile of Particulate Matter 2.5



Source: EJScreen

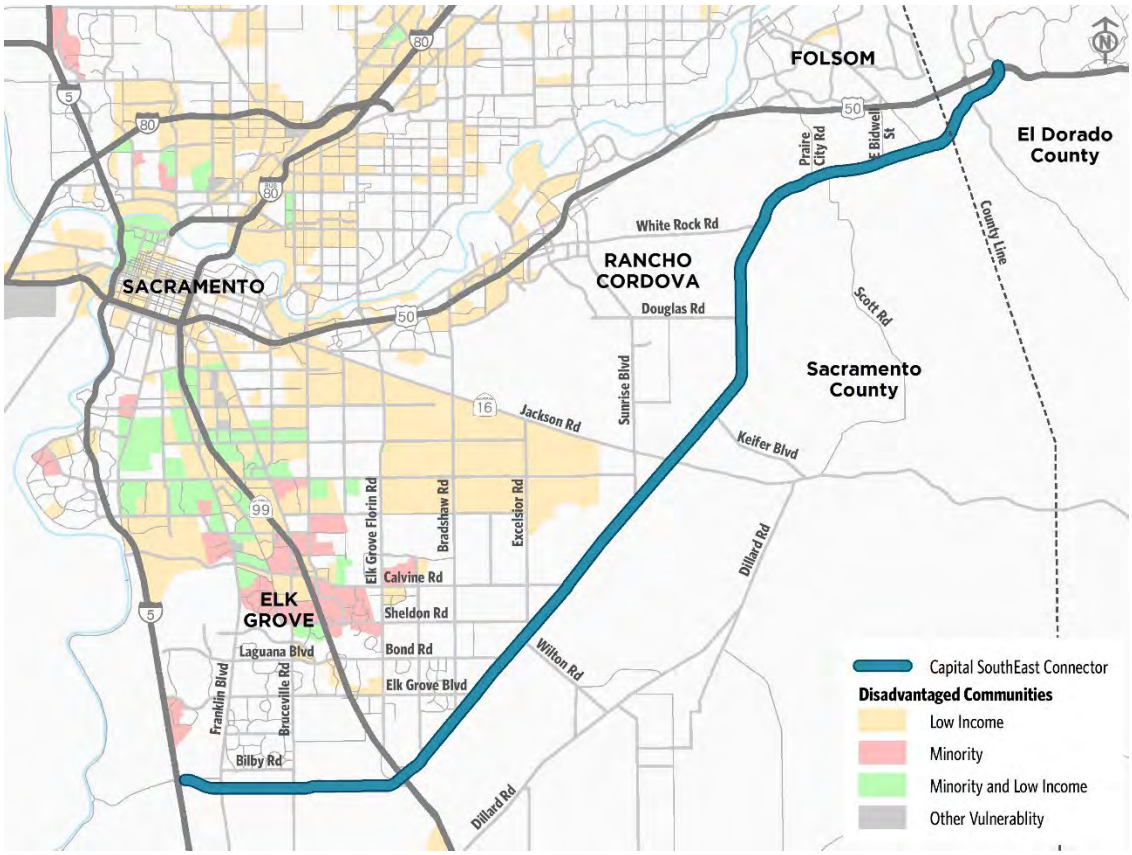
The state of California's environmental justice screening tool, CalEnviroScreen, takes a similar approach to EPA's EJScreen and uses 21 exposure, environmental effect, sensitive population, and socioeconomic factor indicators to determine a census tract's score relative to others in the state. The Connector does directly not impact any of the most disadvantaged or environmentally burdened communities in Sacramento County. The areas surrounding Kammerer Road that have relatively higher environmental burdens along the Connector alignment are actively under development and have been the subject of additional outreach and planning as part of the Kammerer Road Urban Design Study.

More information on CalEnviroScreen, including example maps, is provided in **Appendix A**.

2020 SACOG DISADVANTAGED COMMUNITIES

The SACOG 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) Environmental Justice Analysis utilized demographic and socioeconomic indicators (race/ethnicity, low income, vulnerabilities like concentration of older adults) as well as CalEnviroScreen to identify disadvantaged communities within the region. As shown in Figure 4, like with EJScreen, the SACOG disadvantaged communities are clustered largely along major roadway corridors, especially I-5 and SR 99 south of Sacramento. The Connector alignment does not pass through any of the SACOG disadvantaged communities and as such does not have any direct impact on these communities.

Figure 4 SACOG Disadvantaged Communities



Source: SACOG 2020 MTP/SCS

V. Alignment with Equity Plans

The Connector project is in alignment with several existing regional plans and state and federal guidance in terms of the project's anticipated benefits related to equity, mobility, quality of life, and economic opportunity. Each of these plans and policies is discussed below in relation to the Connector project.

SACOG MTP/SCS: ENVIRONMENTAL JUSTICE ANALYSIS

> "The [environmental justice] analysis is an important base line approach to understanding the residents of the Sacramento region and their transportation needs
>
> –2020 MTP/SCS Environmental Justice Analysis

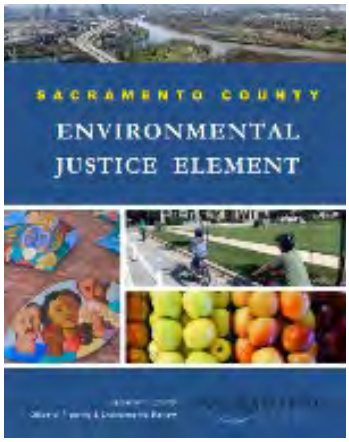
The MTP/SCS is a blueprint to improve the livability and prosperity of the Sacramento region through transportation options, affordable housing, and access to jobs and economic opportunity. As part of the planning effort, agency staff worked with the community to identify and map disadvantaged communities, as documented in the plan's environmental justice analysis. This analysis helps guide investment that will support diverse transportation choices and meet the needs of the region's underserved and disadvantaged residents. The mapping of disadvantaged communities was used to determine benefits from the Connector, as described in the previous section. The Connector project is one of the major road and highway capacity projects included within the MTP/SCS to facilitate SACOG's fiscally constrained transportation and land use plan. As part of the MTP/SCS, the Connector project improvements contribute to meeting development and economic accessibility needs while also meeting federal and state air quality and greenhouse gas emissions targets. The Connector project helps facilitate access between the urban centers where nearly two-thirds of the region's new housing and 85 percent of its job growth are expected.

SACOG OUR PATH FORWARD: THE PROSPERITY STRATEGY

This framework for the recovery and advancement of the Sacramento regional economy identifies core strategies to drive the region's prosperity and inclusive growth. Key tenets of the framework include (1) expanding sector-based workforce development and (2) targeting infrastructure investment to support economic clusters and market drivers.

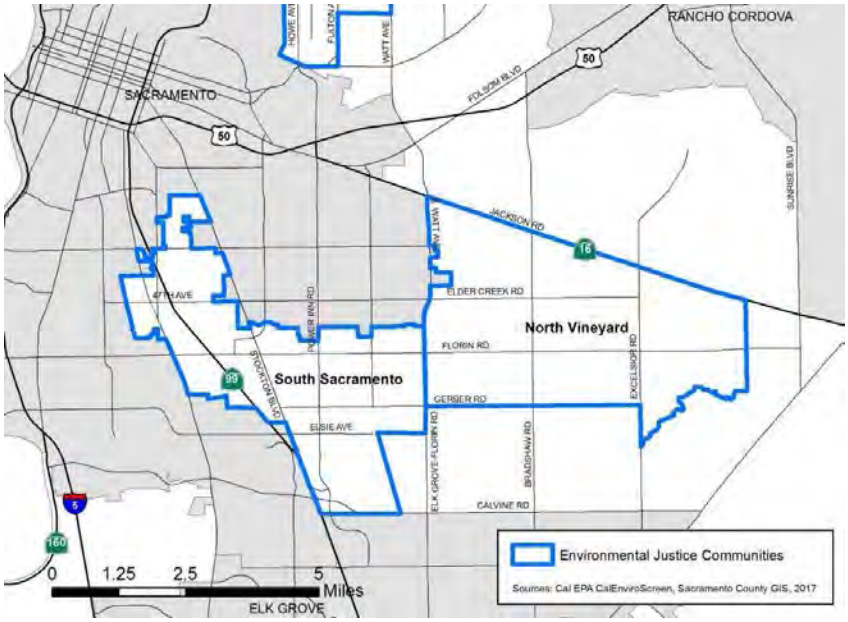
The Connector project supports these goals and promotes access to economic prosperity by providing an east-west connection for developing and rural communities along the corridor to regional job centers. In addition, the Connector will implement equity-oriented policies such as partnerships with Disadvantaged Business Enterprises (DBEs) to promote workforce development and inclusive opportunity, as further described in the next section.

SACRAMENTO COUNTY ENVIRONMENTAL JUSTICE ELEMENT



The Environmental Justice Element (EJ Element) of the County's 2030 General Plan addresses the disparate environmental and public health impacts affecting disadvantaged communities within Sacramento County. The Plan identified EJ communities based on CalEnviroScreen and the SACOG MTP/SCS. Communities identified include South Sacramento and North Vineyard, as shown in Figure 5.

Figure 5: Sacramento County EJ Communities



Environmental Justice Element of Sacramento County's 2030 General Plan

The EJ Element includes objectives, policies, and implementation measures for topical areas that include Physical Activity and Reduce Pollution Exposure. Key objectives and policies that align with the Connector's goals and benefits include:

- **Physical Activity Policy EJ-21: "Provide safe, low stress, interesting and convenient environments for pedestrians and bicyclists."** The Connector includes a Class I multi-use path along most of its alignment, separated from the roadway by a vegetated buffer. In some areas, buffered bicycle lanes and sidewalks will be provided. The multi-use path will be connected to local and regional trails, as well as development adjacent to the corridor and transit facilities.
- **Reduce Pollution Exposure Policy EJ-29: "… improve air quality in Environmental Justice Communities."** The western edge of the South Sacramento EJ Community partially straddles SR 99. As further discussed in the next section, the Connector project reduces vehicle miles traveled on SR 99 by approximately 0.31 percent, resulting in improved air quality.

CALTRANS EQUITY STATEMENT

The Caltrans Equity Statement (2020) was established to acknowledge historic disproportionate impacts on communities of color and underserved communities and establish Caltrans' commitment to achieving equity in transportation. The statement acknowledges that disadvantaged communities have "experienced fewer benefits" and that "disparities reflect a history of transportation decision making that… 'quite literally put up barriers, divided communities, and amplified racial inequities, particularly in our Black and Brown neighborhoods'". The Statement

of Commitment defines equity as “when everyone has access to what they need to thrive – starting with our most vulnerable – no matter their race socioeconomic status, identity, where they live, or how they travel.” The statement also establishes four metrics for accountability:

1. **People** – Creating a workforce that is representative of the communities served.
2. **Programs and Projects** – Meaningfully engaging communities most impacted by structural racism by creating more transparent, inclusive, and ongoing consultation and collaboration processes.
3. **Partnerships** – Increasing pathways to opportunity for minority-owned and disadvantaged business enterprises, and for individuals who face systemic barriers to employment.
4. **Planet** – Combating the climate crisis and its disproportionate impact on frontline and vulnerable communities.

As discussed in the Project Benefits section below, the Connector project supports these metrics and goals through its workforce development and procurement practices, meaningful engagement with communities, and contributing to the reduction of greenhouse gas emissions and other air toxins that negatively impact vulnerable communities.

UNITED STATES EXECUTIVE ORDER 12898

In 1994, President Clinton signed Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The executive order directed federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations, develop a strategy for implementing environmental justice, and promote nondiscrimination in federal programs that affect human health and the environment. In the context of transportation, the executive order requires that environmental justice-related impacts be considered as part of federal projects or programs, including state or local projects receiving federal funding. As noted in analysis and benefits below, the Connector does not impact any environmental justice or other disadvantaged communities as defined by the U.S. Environmental Protection Agency (EPA).

UNITED STATES EXECUTIVE ORDER 13985

In 2021, President Biden signed Executive Order 13985 – Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. The executive order calls on federal agencies to advance equity by identifying and addressing barriers to equal opportunity that underserved communities may face due to government policies and programs. In response to this order, USDOT developed an Equity Action Plan (2022) to highlight key actions the USDOT will undertake to expand access and opportunity while focusing on underserved, overburdened, and disadvantaged communities. Key actions identified by USDOT include supporting wealth creation for disadvantaged businesses, technical assistance to support transportation investments that provide benefits to underserved and overburdened communities, empowering communities in transportation decision-making, and expanding access by removing barriers to affordable transportation options. As detailed below, the Connector supports increased opportunities for disadvantaged businesses, has meaningfully engaged and empowered the community in transportation decisions, and helps to reduce barriers to opportunity by supporting multimodal transportation connections and increasing mobility and accessibility across the Sacramento region.

VI. Project Equity Analysis and Benefits

As shown through the mapping of disadvantaged communities in the section above and **Appendix A**, the Connector project does not overlap with disadvantaged communities as defined at a federal, state, or regional level. Therefore, the project does not directly impact disadvantaged communities. In order to assess indirect benefits from the Connector project, the following outcomes of the Connector were considered:

- Decreasing vehicle miles traveled along the State Highway System
- Reducing barriers for rural and developing communities
- Supporting equitable job opportunities
- Utilizing inclusive community engagement
- Improving non-motorized and transit opportunities

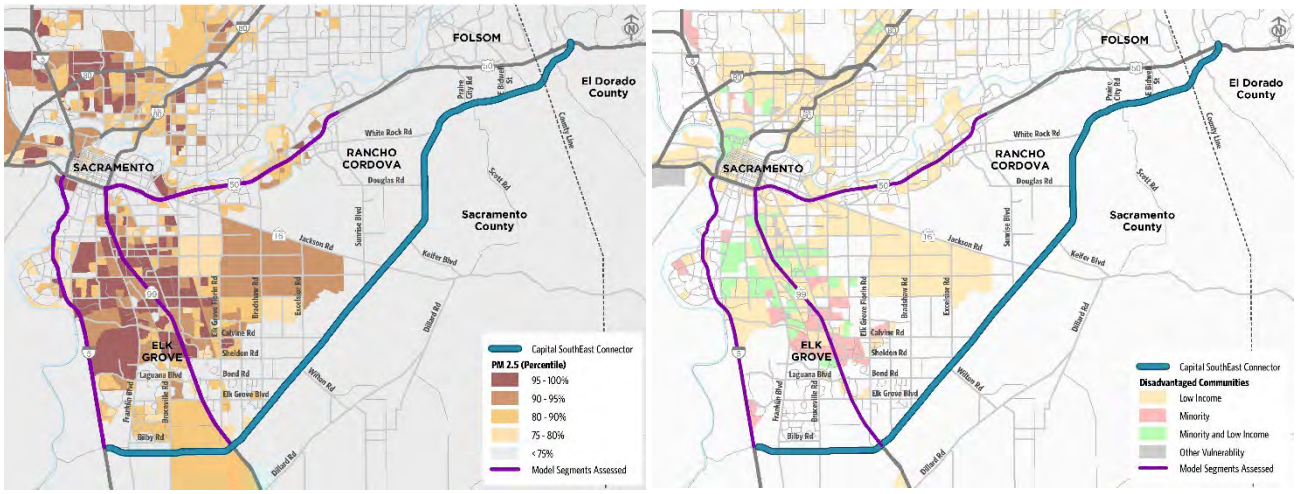
DECREASING VEHICLE MILES TRAVELED ALONG THE STATE HIGHWAY SYSTEM

Communities along highway corridors have historically been known to be susceptible to negative health impacts from traffic related pollutants. This correlation can be seen through the federal and state environmental screening tools discussed in the prior section. For example, CalEnviroScreen includes traffic impacts as one of the exposure impact indicators and states that “major roads and highways can bring air pollutants and noise into nearby neighborhoods.”

The Connector project creates new regional connections for passenger and freight vehicles, which reduces vehicle miles traveled (VMT) and vehicle-generated pollutants along the SHS. As documented in the September 2021 memorandum, Travel Demand Model (TDM) Update Summary, produced by Kimley Horn and independently peer reviewed by Kittelson, the JPA developed a TDM for the Connector to assess anticipated changes with the project. The Connector TDM is based on the Sacramento Area Council of Governments (SACOG) SACSIM travel demand model. The TDM was refined to include a more detailed roadway network and updated land use data consistent with existing conditions and approved development plans. Based on the model, congested vehicle miles traveled across the region are “reduced primarily due to vehicles using the Connector as an alternative to congested US-50 and SR-99 roadways.” This travel demand model was used to conduct the following air quality analysis in proximity to state routes.

Using the TDM model, the model segments of I-5, US 50, and SR 99 south of Sacramento (shown in Figure 6) were analyzed to determine to what extent VMT on these roadways is influenced by the Connector project given their proximity to disadvantaged communities in the SACOG region.

Figure 6 Highway Analysis Segments Overlayed on EJScreen and SACOG Disadvantaged Community Mapping



Source: EJScreen (left) and SACOG MTP/SCS (right)

Table 1 summarizes the change in VMT with the Connector project. As shown, the largest reduction in VMT with the Connector project is expected on US 50. VMT is also reduced on SR 99, which passes through disadvantaged communities as defined by EJScreen and SACOG in the 2020 MTP/SCS, as shown in Figure 6.

Table 1: VMT on I-5, US 50, and SR 99 within the Anticipated Connector Influence Area

Area	Daily VMT		
	I-5	US 50	SR 99
No Connector Project	1,225,654	3,090,005	2,479,541
With Connector Project	1,220,422	3,066,893	2,471,970
Difference (With Connector – No Connector)	-5,232	-23,113	-7,571
Percent Change	**-0.43%**	**-0.75%**	**-0.31%**

Source: Rincon Consultants (Rincon) & Kittelson, 2022.

As documented in an air quality assessment done for the Connector[7], the reduction in VMT along I-5, US 50, and SR 99 results in similar reductions in mobile source air toxins (MSATS) along these roadways. The analysis found that disadvantaged communities along these roadways will experience improvements in air quality from a reduction in vehicle miles traveled on I-5, US 50, and SR 99 as a result of the Connector project.

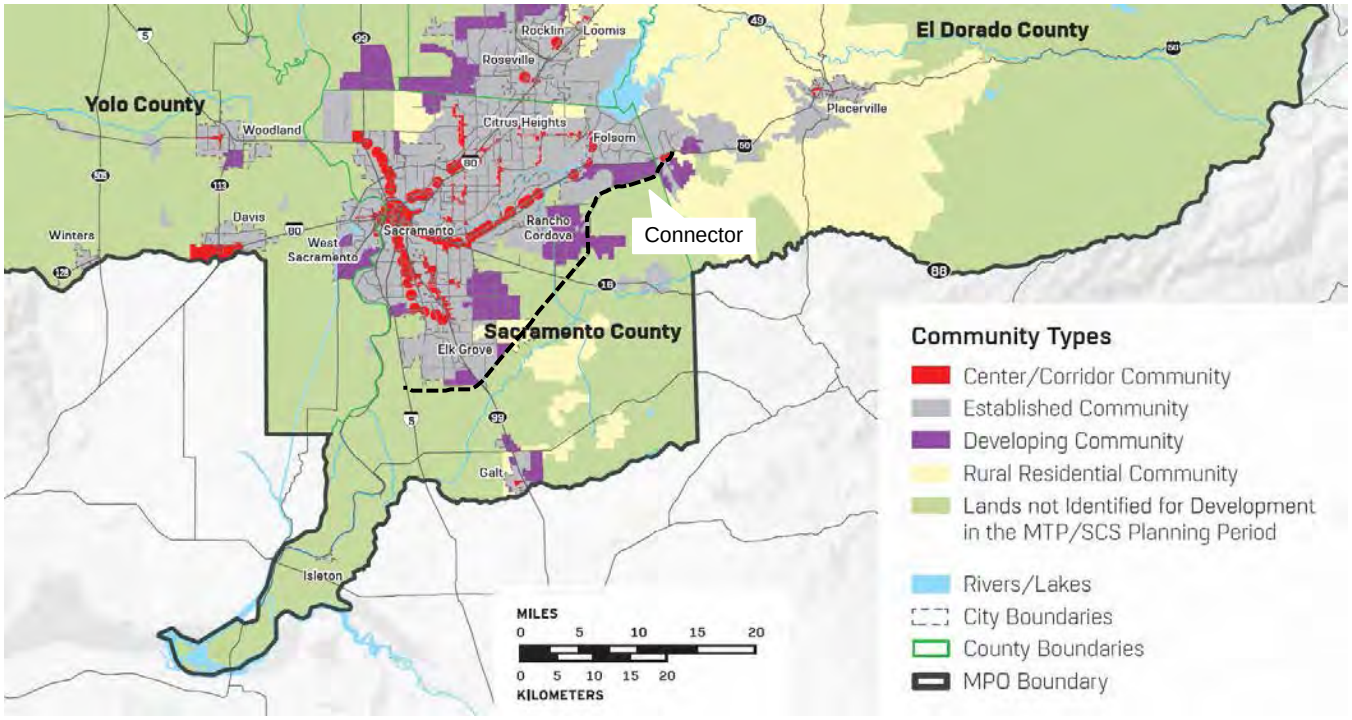
REDUCING BARRIERS FOR RURAL AND DEVELOPING COMMUNITIES

One way to help reduce barriers to opportunity is to increase connections to jobs and employment centers. Many communities along the corridor are identified in the SACOG 2020 MTP/SCS as Developing Communities or Rural Residential Communities. The MTP/SCS defines developing communities as the “next increment of urban expansion.” The Connector project connects existing rural and developing communities in southeast Sacramento County to regional and local opportunities via a regional expressway and multi-use path. Based on information in Appendix C of the MTP/SCS, a 794% increase in jobs and 450% increase in housing is projected in developing communities adjacent to or near the Connector between 2016 and 2040[8].

[7] Air Quality and Greenhouse Gas Emission Benefits, Rincon Consultants & Kittelson, May 2022.
[8] Calculations for developing communities within the Connector project area are detailed in Appendix B

As shown in Figure 7, the Connector will serve as a link between the established communities of Elk Grove, Folsom, and El Dorado Hills and facilitate access to the rural communities and developing communities surrounding the current urbanized areas of Elk Grove, Rancho Cordova, Folsom, and El Dorado Hills. As a regional facility, the Connector reduces travel times between these communities, including the disadvantaged communities identified along I-5 and SR-99 within the influence area of the Connector and beyond. As documented in the TDM for the Connector, "the addition of the Connector results in a net decrease of 998 daily VHT [vehicle hours traveled] within the region" (Kimley Horn, 2021).

Figure 7: Connector Area SACOG MTP/SCS Community Types



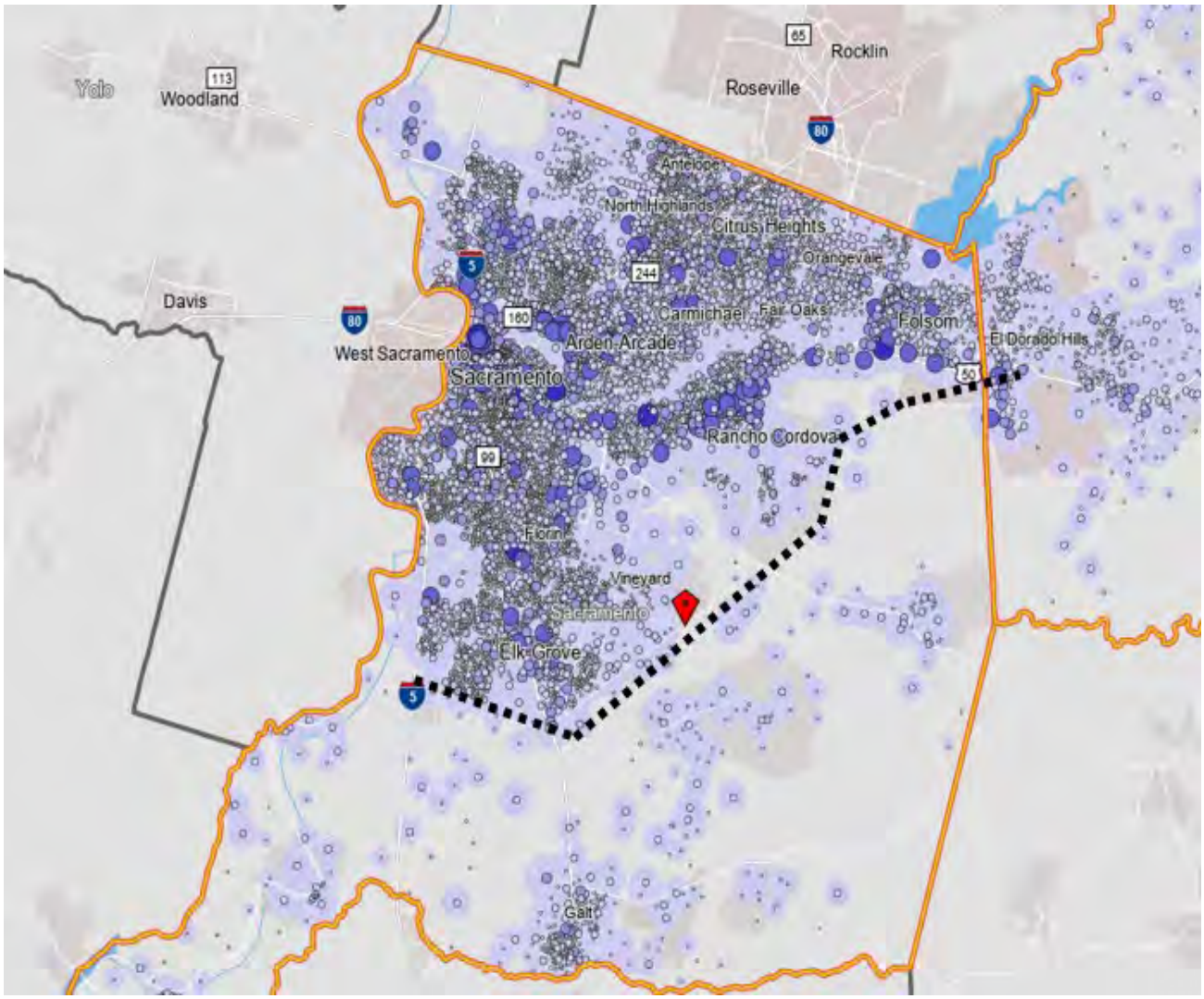
Source: SACOG 2020 MTP/SCS.

This reduction in travel time, alongside the more direct connections provided by the Connector between communities, will reduce travel times to essential services and opportunities for the communities along State Routes 99 and 50, and Interstate 5. The communities along these routes represent the some of the most disadvantaged communities within the Sacramento Region, as described and mapped in Appendix A. In particular, reduced travel times along these routes would improve accessibility to essential services including Kaiser Permanente South Sacramento, Methodist Hospital of Sacramento, UC Davis Medical Center, Shriners Children's Hospital, CSU Sacramento, Cosumnes River College, Sacramento City College, 99 Ranch Market, Walmart, El Dorado Hills Town Center, as well as numerous shopping centers, schools, and local and regional parks. Reducing travel times to these facilities within the broader sphere of influence of the Connector will increase accessibility for the vulnerable and disadvantaged communities that live along these corridors and provide greater transportation choices, as well as choices for goods and services for these communities.

In addition to the indirect benefits noted above from the Connector, the project would also directly benefit rural communities. The Connector increases transportation mobility and accessibility by providing a safer and more direct connection between the rural and developing community areas of Southeast Sacramento with essential services and the major job centers in the urbanized areas at either end and along the Connector. Figure 8 shows the density of job locations in Sacramento and El Dorado County as reported to the U.S. Census Bureau's

Longitudinal Employer-Household Dynamics program. This dataset provides detailed local information about economies including job locations and densities as shown in the figure.

Figure 8: Density of Job Locations in and around Connector



Data Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2019).

As can be seen in the figure, the Connector alignment will provide more direct connections between communities and the regional employment centers of Elk Grove, El Dorado Hills, and Folsom. Employment opportunities more directly connected to the Connector include jobs ranging from the industrial and manufacturing in southern Elk Grove along SR 99 and Waterman Road, to the educational, healthcare, retail, and service industry jobs in the Folsom Plan Area and along East Bidwell St in Folsom, to the growing medical and service jobs in El Dorado Hills Business Park. The Connector will also provide more direct connections between communities to large, innovative companies in Sacramento County like Intel and Aerojet Rocketdyne in the Folsom area, the large business parks in Rancho Cordova along Sunrise Boulevard and Zinfandel Drive, and the logistic hub surrounding Mather Airport. In addition to the direct benefit of reducing barriers to accessing these jobs and the essential services noted above, the Connector will facilitate connections between these job opportunities and jobseekers in the disadvantaged communities that are located at either end of the corridor along the existing state routes. By facilitating more direct travel between destinations and reducing vehicle hours traveled regionally, the Connector

project will help facilitate increased opportunities to access jobs and essential services for both disadvantaged communities as well as the region as a whole.

SUPPORTING EQUITABLE JOB OPPORTUNITIES

A healthy, prosperous economy is an inclusive one. Public works and infrastructure projects pose prime opportunities for equitable economic development. The Connector project supports equitable job opportunities through:

- **Equal Opportunity Policies**: The JPA has established equal opportunity policies as part of its Procurement Manual to prevent discrimination against any person or group of persons in connection with the procurement of goods and services" and to "take all reasonable steps to ensure disadvantaged business enterprises (DBEs) have the maximum opportunity to compete for Connector contracting opportunities.[9]" These policies help to prevent discrimination in connection with any procurement activities of the JPA and provide additional support to ensure DBEs have the greatest opportunity possible to compete for contracts as part of the Connector's implementation.
- **Project Labor Agreements**: Project construction contracts have included DBE goals where applicable to provide equal opportunities to minority and women owned businesses and utilize a project labor agreement for contractors working on the Project. This has translated into several million dollars for DBE contractors to date.
- **Local Partnerships and Workforce Development**: The Capital Southeast Connector Joint Powers Authority (JPA) collaborated with Sacramento State's Department of Civil Engineering in 2018 to simulate real-life professional engineering project experience in a local context[10]. Students, under the mentorship of professional engineers, developed designs for a segment of the Connector and received feedback during a JPA board session. This successful partnership fostered the development of local workforce to support the project (or similar projects). This effort is in line with USDOT's recent expanded commitment to local hiring and workforce development, helping to "make sure that our investments create jobs for people in the communities where the projects are located.[11]" Sacramento State has been noted as one of the most diverse campuses according to the U.S. News & World Report 2018 Best Colleges rankings with an inclusive student population that "transcends race, ethnicity, sex, socioeconomic status, gender identity, [and] immigration status.[12]" Workforce development programs like that supported by the JPA at Sacramento State help to support access to new skills and learning opportunities to support careers for a diverse student population.

UTILIZING INCLUSIVE COMMUNITY ENGAGEMENT

The JPA and its partners have conducted focused and meaningful engagement throughout the project development and approval process to engage with the communities surrounding the project, including several communities that are not typically represented in normal engagement activities. Examples of this engagement include:

[9] Procurement Manual, JPA, 2018.
[10] https://www.csus.edu/college/engineering-computer-science/civil-engineering/_internal/_documents/CE_Connection_Spring18.pdf
[11] https://www.transportation.gov/briefing-room/us-department-transportation-announces-expanded-local-hire-and-workforce-development
[12] https://www.csus.edu/news/articles/2017/9/22/sac-state%27s-diversity-a-bright-spot-in-noted-rankings.shtml

- **Tribal Consultation:** The JPA regularly consults with the Native American Heritage Commission and numerous local tribes when preparing environmental assessments for the Connector project. These tribes include, but are not limited to, the Miwok, Maidu, Washoe, Wilton Rancheria, and Auburn Rancheria tribes.
- **Agricultural Working Group:** In 2014, the JPA created the Agricultural Working Group to increase targeted outreach and address issue-specific stakeholder concerns related to impacts on agricultural operations. Invited participants included landowners and the Sacramento County Farm Bureau.
- **Grant Line Road–Sheldon Area:** The JPA and the City of Elk Grove have worked together to identify preliminary roadway concepts for Grant Line Road between Bond Road and Calvine Road (Connector Segment C). This segment was identified as unique in the project development process based on community input received during the preliminary environmental impact report process. In order to ensure valued community input was received and was inclusive, the JPA and City of Elk Grove hosted three additional public meetings between 2020 and 2022 to solicit direct input from community members to develop a preferred alternative as part of the Precise Roadway Plan.[13] Additionally, the JPA and City staff meet monthly with Sheldon community leaders to gather community input and provide project updates. This helps guide the JPA and City of Elk Grove to a community-driven alternative that is consistent with the City's General Plan, Rural Roads Improvement Standards, and the JPA's Design Guidelines.

IMPROVING NON-MOTORIZED AND TRANSIT OPPORTUNITIES

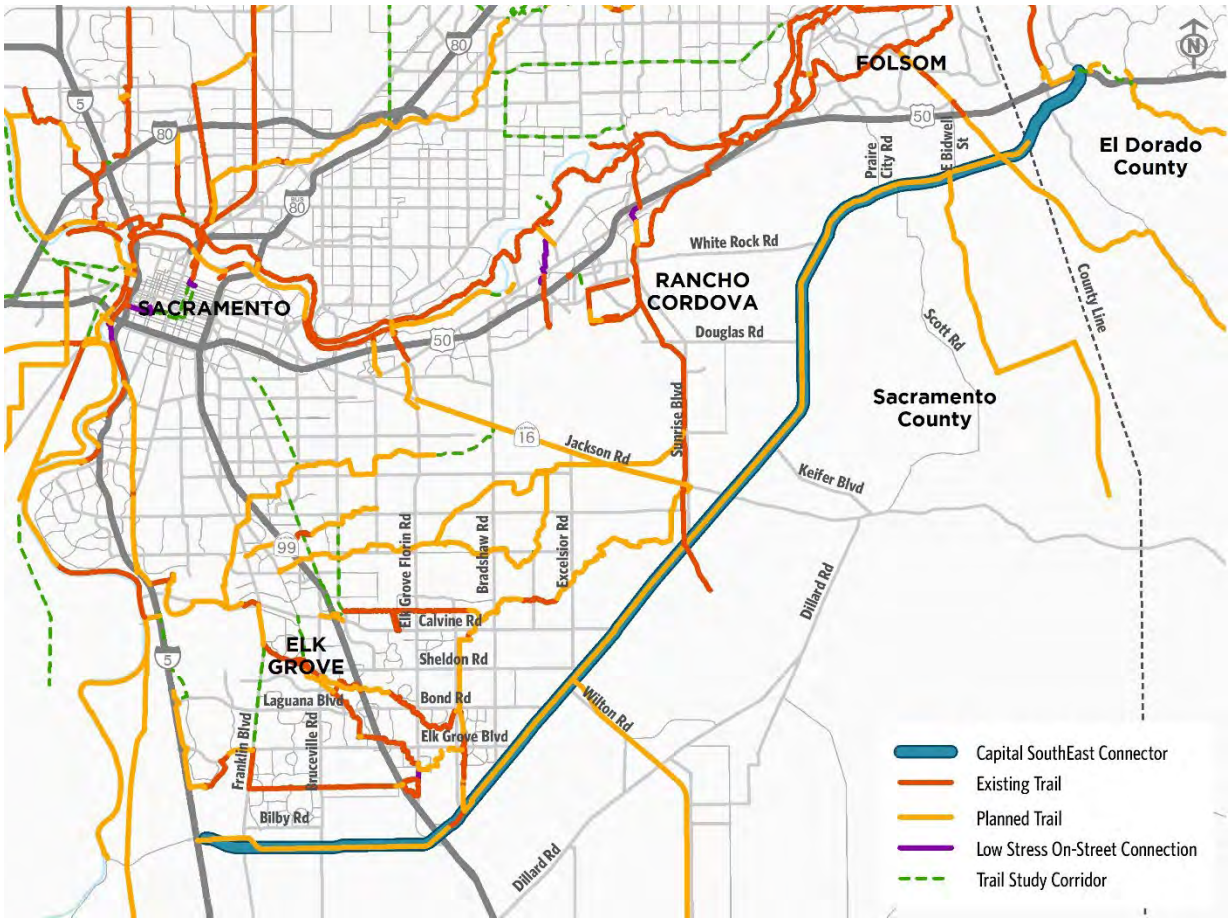
The Connector includes a Class I multi-use path along most of the alignment, separated from the roadway by a vegetated buffer. In some areas, buffered bicycle lanes and sidewalks will instead be provided, given the context and proximity of adjacent development. The multi-use path will be connected to local and regional trails, as well as development adjacent to the corridor and transit facilities. Where spacing between intersections is greater than half a mile or where bicycle and pedestrian crossing demand is anticipated to be high, a protected crossing will be provided. These project components will be designed based on federal, state, and local guidelines and standards and comply with the Americans with Disabilities Act (ADA).

The Connector multi-use path connects rural and growing communities along the corridor to a network of existing and planned trails and bikeways. The latest draft planned trail network by SACOG is shown in Figure 9. The Connector will serve as a northeast-southwest backbone of the regional active transportation and trails system in southeast Sacramento County. This provides multimodal connectivity and travel options, as well as first and last mile connections that can be integrated with future mobility hubs, bus stops, or transit centers. In addition to the trail connections shown, numerous planned bikeway improvements are identified in the City of Elk Grove's Bicycle, Pedestrian, and Trails Master Plan and Sacramento County Bikeway Master Plan including bikeway connections with Jackson Road, Sunrise Boulevard, Prairie City Road, Calvine Road, Sheldon Road, Bradshaw Road, Waterman Road, Bruceville Road, and others. As part of both local jurisdiction plans, the Connector forms a backbone along it's alignment providing a multi-use path connection across southeast Sacramento County.

Additionally, El Dorado Transit, in cooperation with El Dorado County Transportation Commission (EDCTC), is planning a new multimodal transit center adjacent to the corridor. The multimodal transit center will serve as a mobility hub, offering a range of transit options that are easily accessible by walking and biking, further encouraging transit ridership. Creating safe multimodal first and last mile connections to transit is a critical component of removing barriers to accessing transit, and thus mitigating reliance upon a personally owned vehicle. The Connector is proactively constructing an essential network of first and last mile connections which can be integrated with future mobility hubs, bus stops, or transit centers such as the one planned in El Dorado.

13 https://elkgrovecity.org/city_hall/departments_divisions/public_works/capital_improvements/grant_line___sheldon_feasibility_study

Figure 9: Connector and SACOG Draft Existing and Planned Regional Trail Network



Source: SACOG, 2022.

VII. Conclusion

As documented throughout this memorandum, the Connector project has been designed towards the goals of supporting an equitable transportation system and environmental justice, and removing barriers to opportunities. . The Connector does not impact disadvantaged communities as established by regional, state, and federal definitions. Additionally, the Connector provides benefits to disadvantaged and/or vulnerable communities and populations by:

- Supporting local workforce development and contracting opportunities for disadvantaged businesses;
- Engaging meaningfully with communities to shape how the Connector will be developed through communities and agricultural areas;
- Improving air quality along state routes where disadvantaged communities are concentrated in the Sacramento Region; and,
- Providing improved connections between rural communities and the economic centers of the region by providing a high-quality route that increases connectivity, accessibility, and mobility for rural communities.

Appendix A. Equity Criteria Technical Background

This technical appendix provides more background information on the most common tools and criteria used to assess transportation equity by federal, state, and regional agencies. As noted in the memorandum, the professional planning field uses a variety of metrics and terminology to refer to and analyze equity. Equity frameworks are constantly evolving to incorporate new data and context-sensitive approaches. The tools/screening criteria included in this appendix are listed below:

1. EJScreen 2.0
2. Areas of Persistent Poverty (APP)
3. Historically Disadvantaged Communities (HDC)
4. Rural and Urbanized Areas
5. CalEnviroScreen 4.0
6. SACOG Disadvantaged Communities
7. Sacramento County Environmental Justice communities

Each of these screening tools and criteria are discussed and mapped for the area surrounding the Connector in the following section.

Federal Criteria

There are four definitions or criteria for equity communities at the federal level that are currently commonly used to identify communities that experience disparate environmental or economic burdens[14].

- EJScreen
- Areas of Persistent Poverty (APP)
- Historically Disadvantaged Communities (HDC)
- Rural and Urbanized Areas

EJSCREEN

Definition

The Environmental Protection Agency (EPA) developed EJScreen to provide a nationally-consistent screening tool that could be leveraged by the public and government agencies to support environmental justice concerns. The tool combines environmental indicators and demographic indicators into EJ indices and compares

[14] Executive Order 14008 established the Justice40 initiative which outlined the federal government's commitment to addressing climate change and included launching the development of a Climate and Economic Justice Screening Tool to assist agencies in identifying disadvantaged communities. That tool is still being beta-tested. The US Department of Transportation developed a definition for disadvantaged communities based on interim guidance published by the Office of Management and Budget (OMB) in July 2021. The resulting historically disadvantaged communities dataset is referenced in this document.

environmental risk for census tracts in the same state or nationally. Environmental indicators included in EJScreen range from particulate matter (PM) 2.5 and traffic proximity to wastewater discharge. Demographic indicators, such as low income and/or minority individuals, represent populations potentially susceptible to the environmental indicator. Originally released to the public in 2015, the tool is regularly updated.

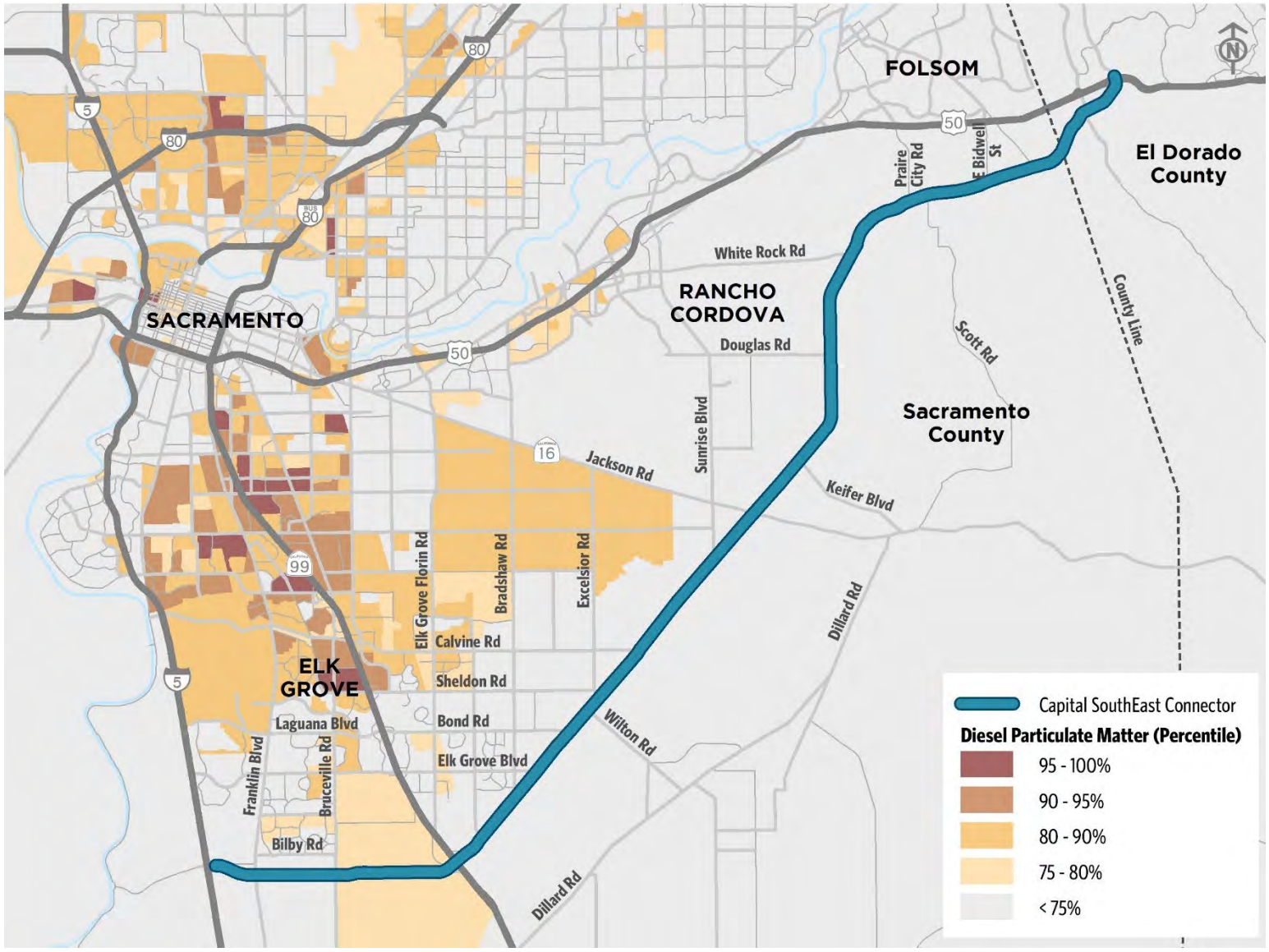
Project Relevance

The following series of maps demonstrate that there are several communities in close proximity to the three freeways (I-5, SR 99, and US 50) that are likely to be influenced by the construction of the Connector project. These communities have higher environmental burdens and vulnerable populations when compared to census tracts across the country and when compared to those tracts adjacent to the Connector alignment. As discussed in the memorandum, these communities are expected to see benefits from the diversion of VMT to the Connector project.

The EJ Indices visualized in the following maps include:

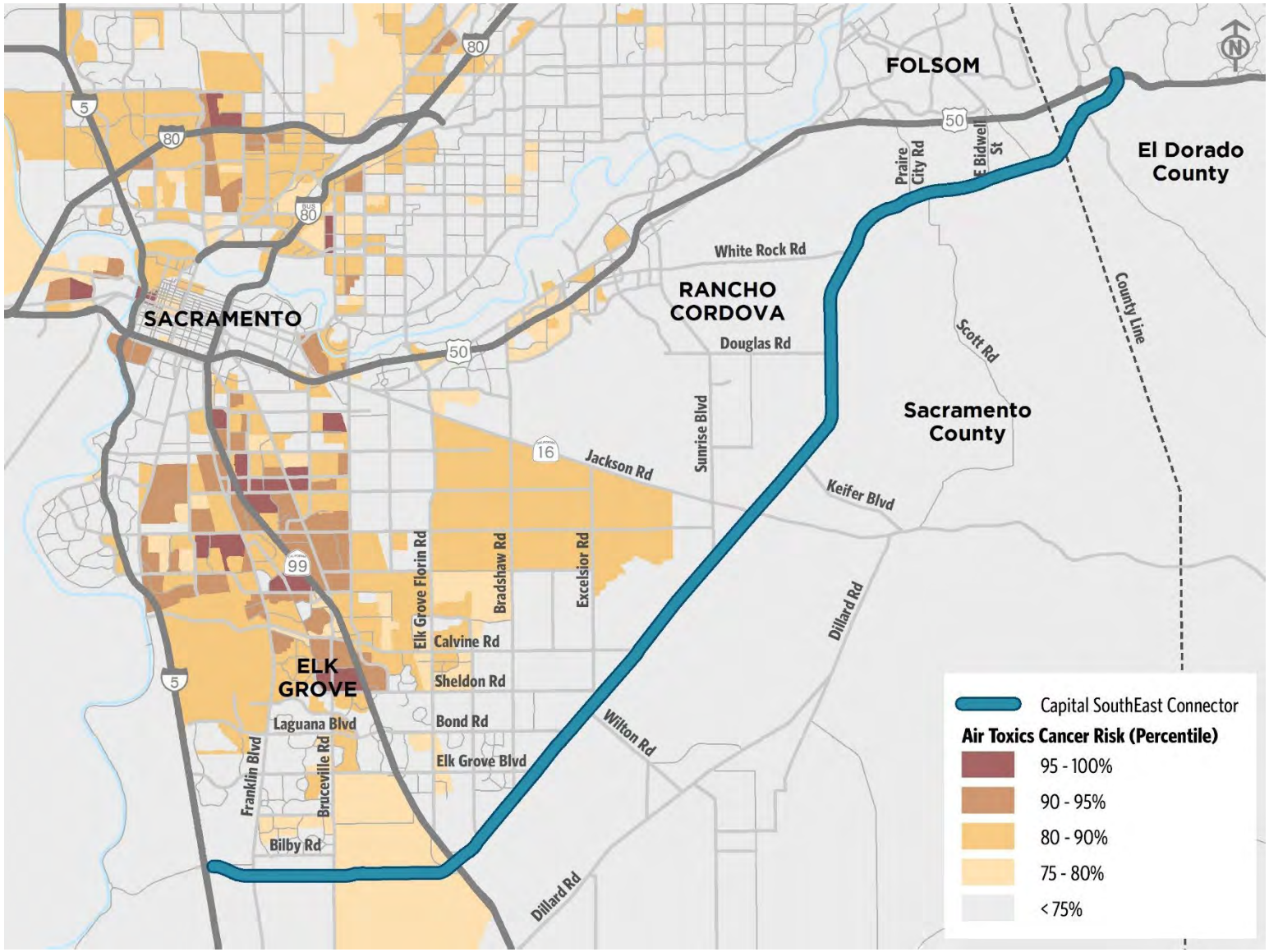
- Diesel particulate matter level in air;
- Air toxics cancer risk;
- Air toxics respiratory hazard index;
- Traffic proximity and volume;
- Ozone level in the air; and,
- PM 2.5 level in the air.

Diesel Particular Matter Level in Air - Compared Nationally



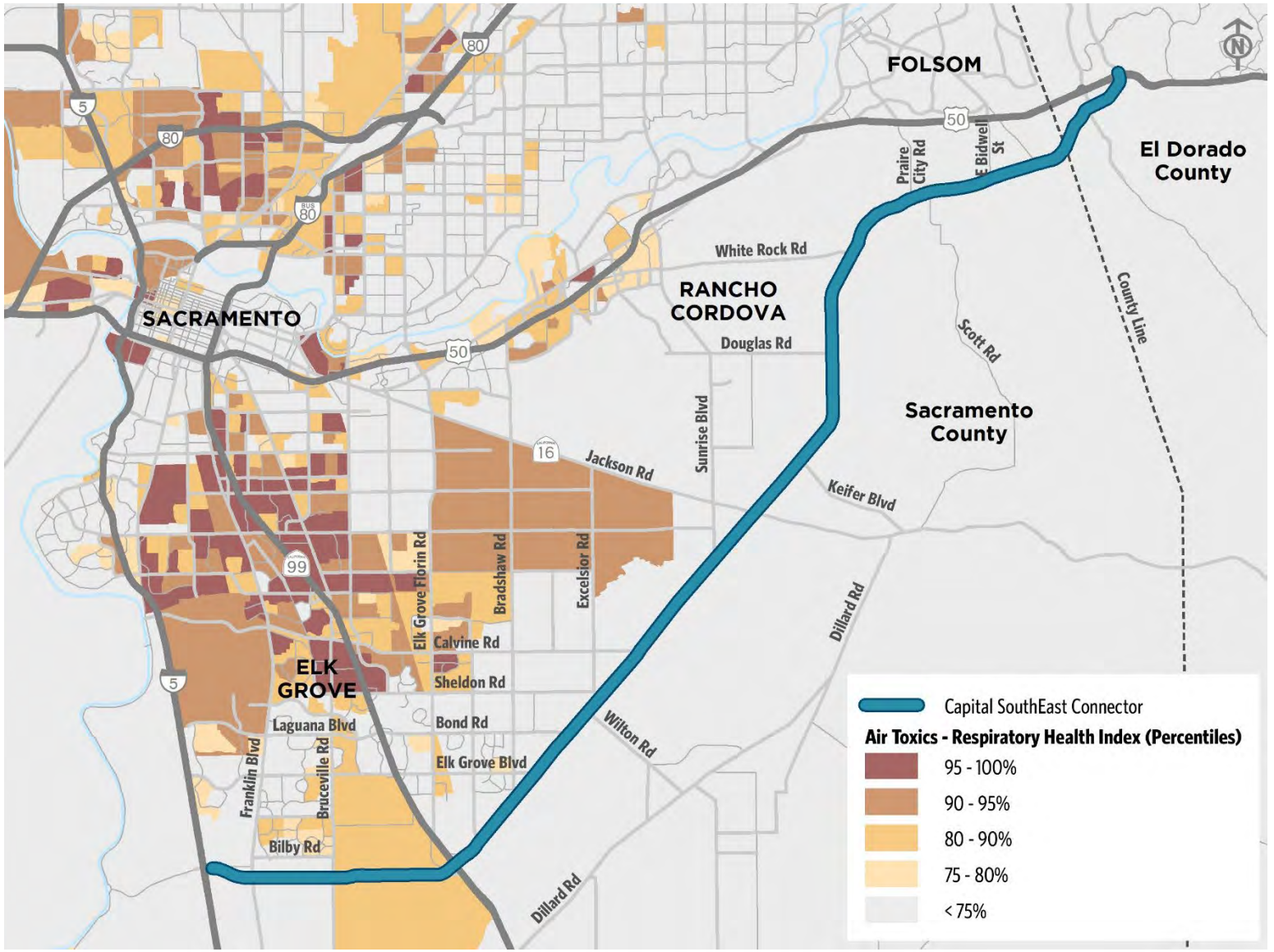
Source: Environmental Protection Agency

Air toxics Cancer Risk - Compared Nationally



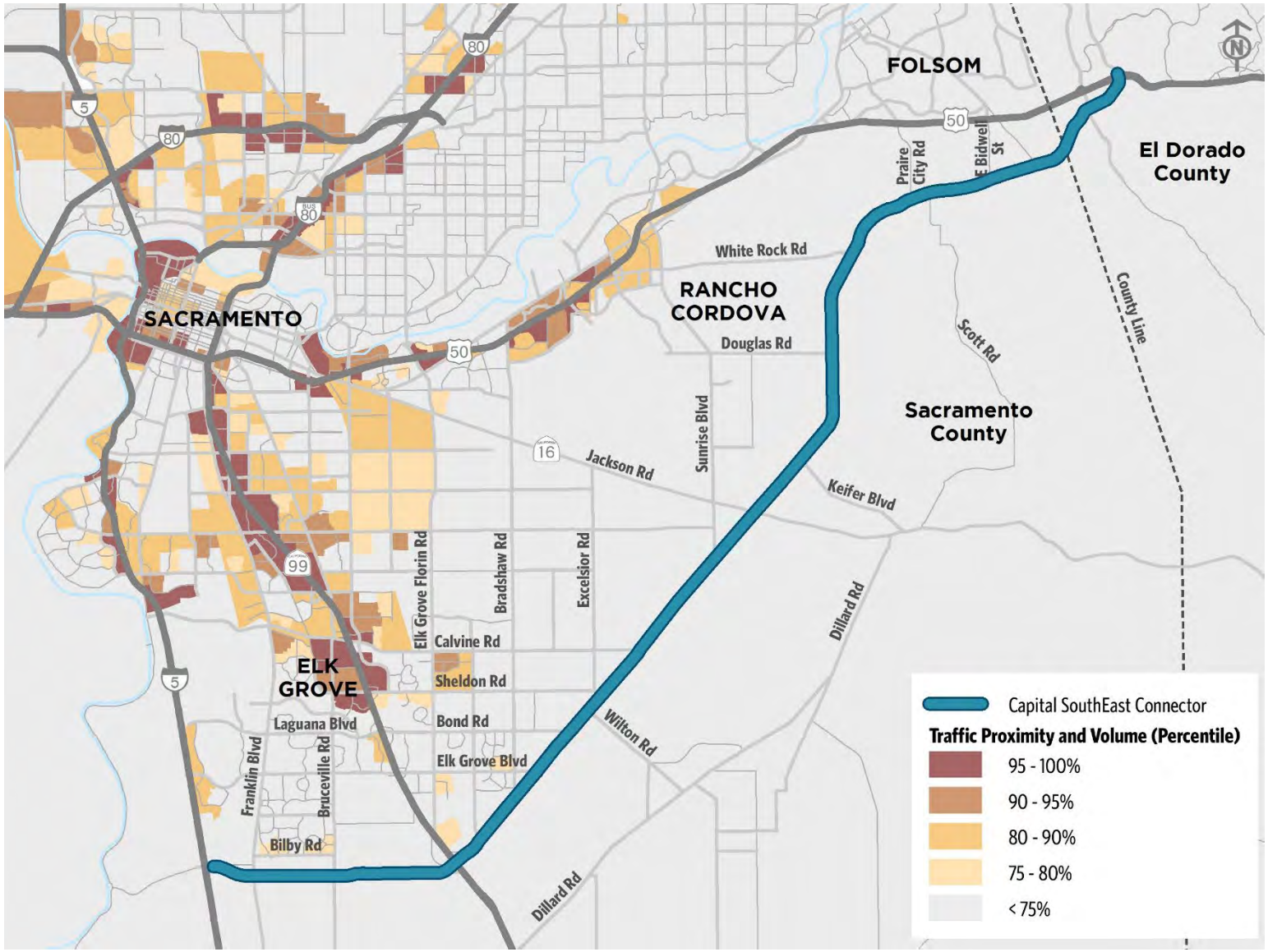
Source: Environmental Protection Agency

Air Toxics Respiratory Hazard Index - Compared Nationally



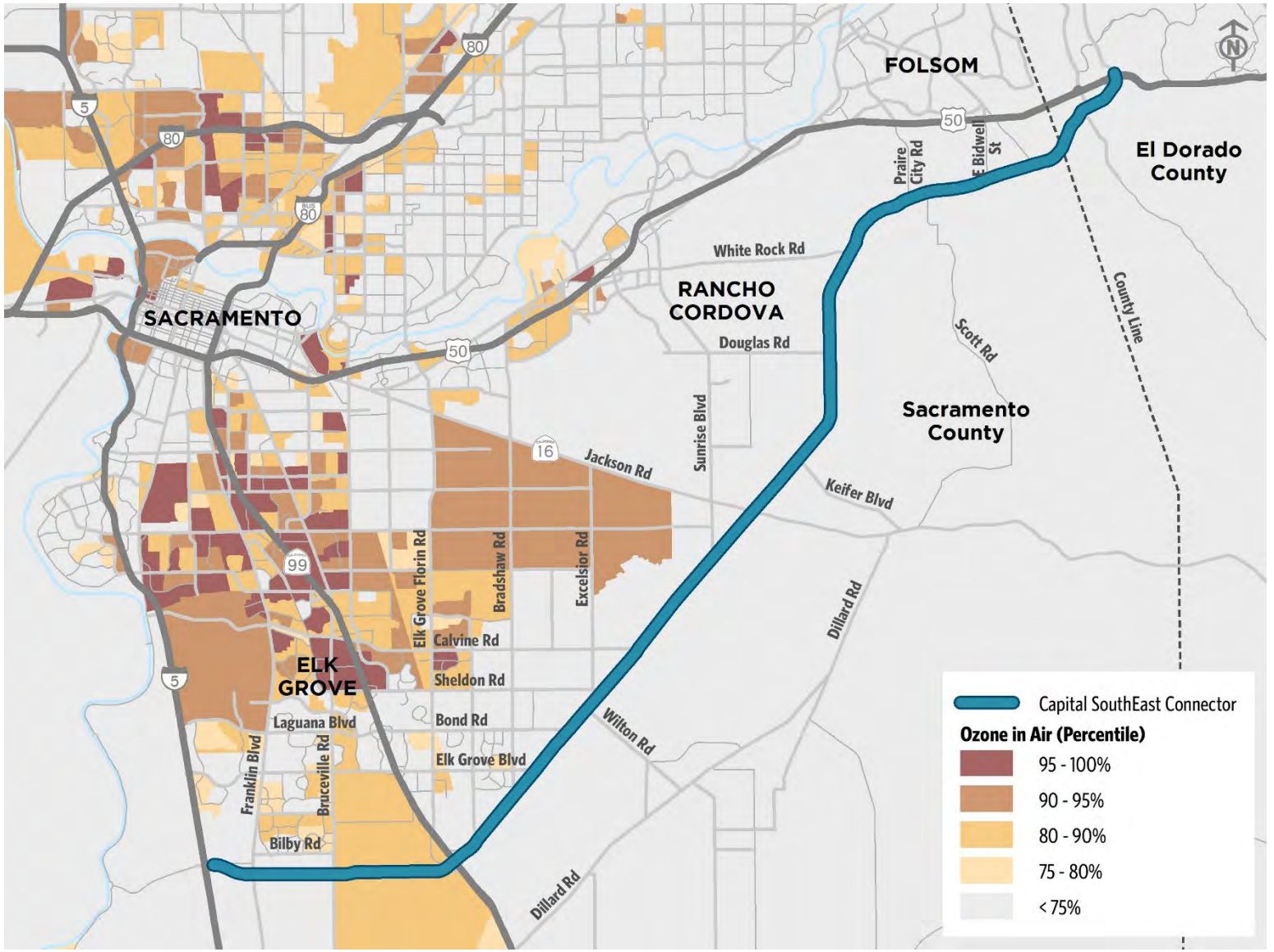
Source: Environmental Protection Agency

Traffic Proximity and Volume - Compared Nationally



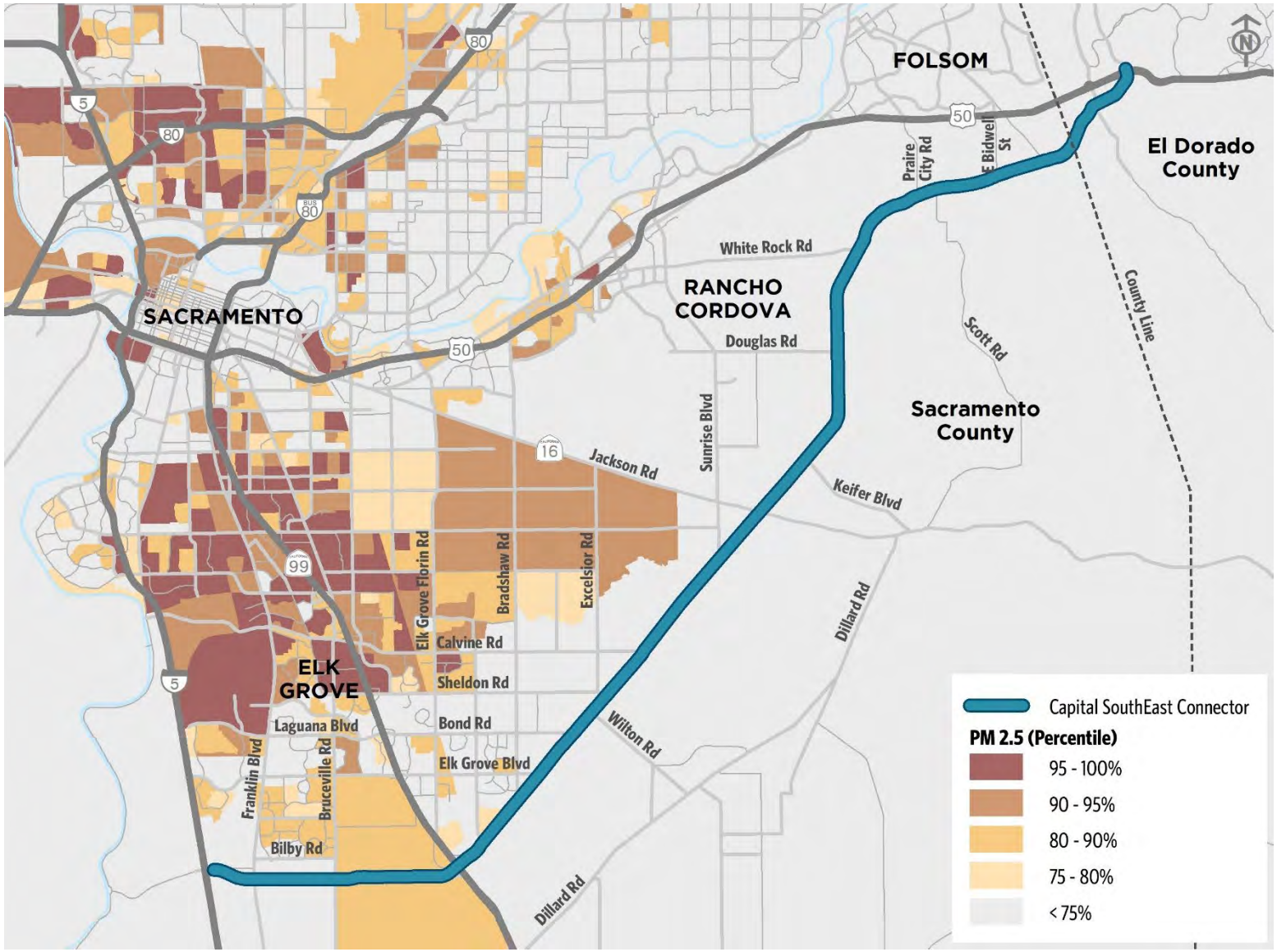
Source: Environmental Protection Agency

Ozone in the Air - Compared Nationally



Source: Environmental Protection Agency

PM 2.5 in the Air - Compared Nationally



Source: Environmental Protection Agency

AREAS OF PERSISTENT POVERTY AND HISTORICALLY DISADVANTAGED COMMUNITIES

Definitions

As a result of EO 14008 which created the Justice40 initiative, the White House Council on Environmental Quality (CEQ) is developing a Climate and Economic Justice Screening Tool (CEJST) to help Federal agencies identify disadvantaged communities that are marginalized, underserved, and overburdened by pollution. While that tool is in development, the U.S. Department of Transportation is using an interim definition to identify disadvantaged communities for Justice40 eligible programs[15]. The Areas of Persistent Poverty (APP) and Historically Disadvantaged Community (HDC) Status tool can be found here.

Historically Disadvantaged Communities

Consistent with guidance from the Office of Management and Budget[16], the federal Department of Transportation (DOT)'s HDC index identifies communities that exceeded the 50th percentile (75th for resilience) across at least four of the following six transportation disadvantaged indicators.

- Transportation Access
- Health
- Environmental
- Economic
- Resilience
- Social

Areas of Persistent Poverty

Area of Persistent Poverty qualifying tracts can be found in this table and is defined as:

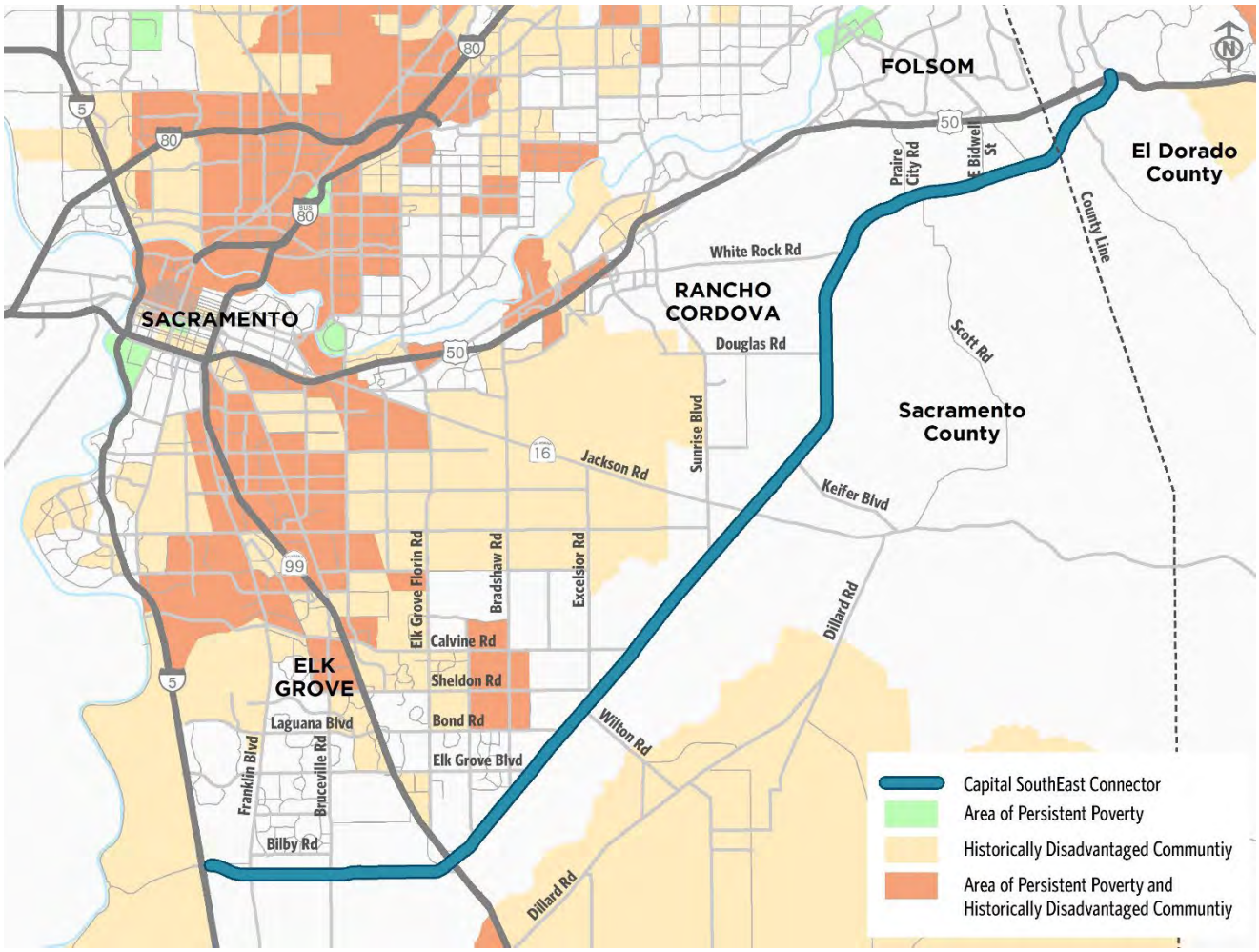
- Any County that has consistently had greater than or equal to 20 percent of the population living in poverty during the last 30-year period, as measured by the 1990 and 2000 decennial census and the most recent annual Small Area Income and Poverty Estimates as estimated by the Bureau of the Census;
- Any Census Tract with a poverty rate of at least 20 percent as measured by the 2014–2018 5-year data series available from the American Community Survey of the Bureau of the Census; or,
- Any U.S. Territory.

Project Relevance

- There is a concentration of HDC and APP qualified census tracts along portions of the core highways, and a significant number of communities along the SR 99 in south Sacramento that qualify as both historically disadvantaged and as areas of persistent poverty. As discussed previously, these communities are expected to see benefits from the diversion of VMT - in particular from exhaust and noise heavy trucks - to the Connector project.

[15] FY22 Relevant Funding Opportunities and Programs: Rebuilding American Infrastructure with Sustainability and Equity (RAISE; Port Infrastructure Development Program (PIDP); National Electric Vehicle Infrastructure (NEV).
[16] M-21-28 (whitehouse.gov)

Areas of Persistent Poverty and Historically Disadvantaged Communities



Source: USDOT

RURAL AND URBANIZED AREAS

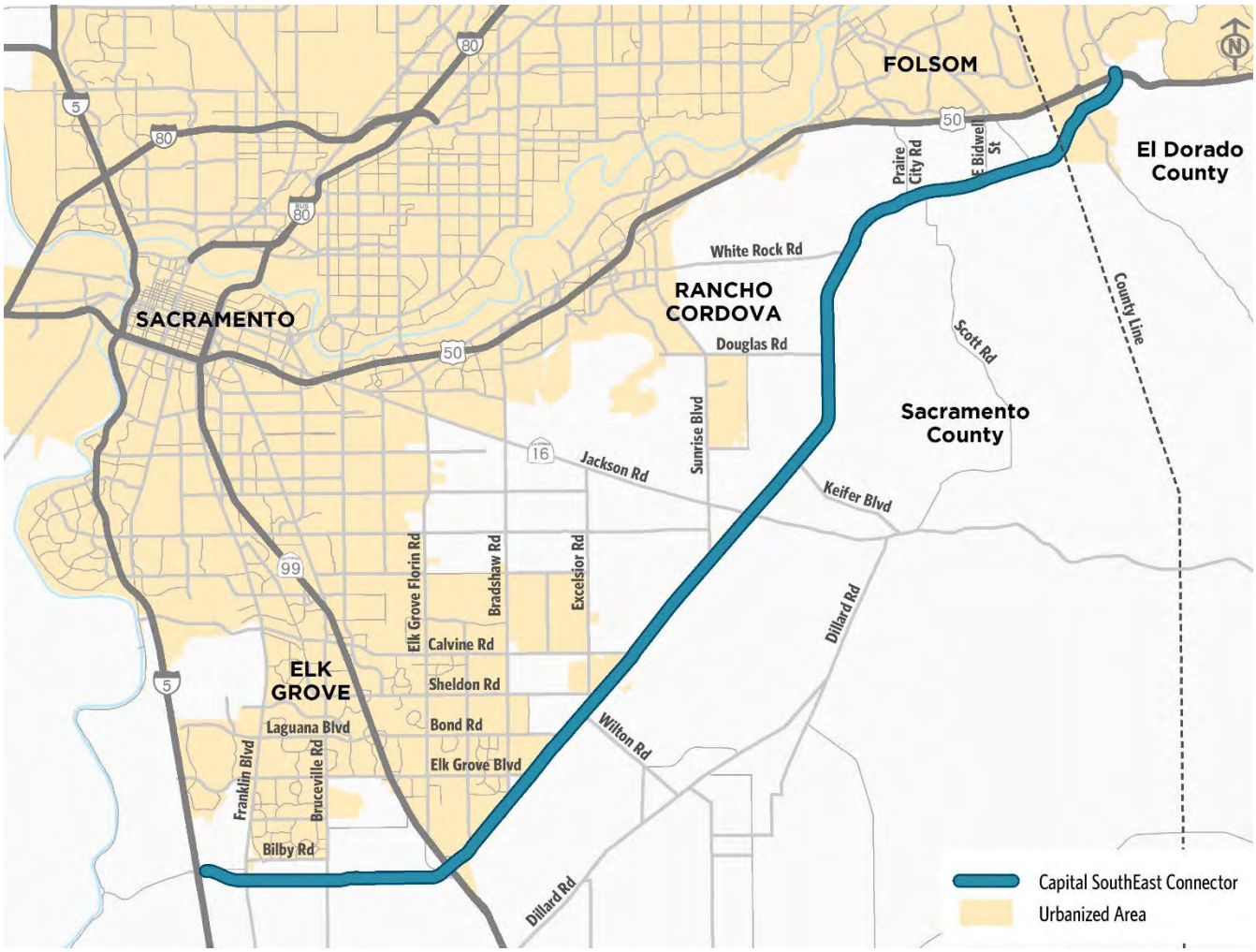
Definition

The U.S. Census Bureau defines “rural” as any population, housing, or territory that is not within an “urban area”. “Urbanized areas” have a population of 50,000 or more and “urban clusters” have a population of at least 2,500 and less than 50,000. At the time of this memo, 2020 Census rural and urbanized areas had not been finalized and thus 2010 data is used for the following map and analysis.

Project Relevance

The rural and historically disadvantaged communities to the north and south of segments B1, B2, B3, and C are well positioned to benefit from the Connector’s safety and connectivity improvements as discussed in the memorandum.

South Sacramento County Urbanized Areas



Source: US 2010 Census

State Criteria

CALENVIROSCREEN (CES)

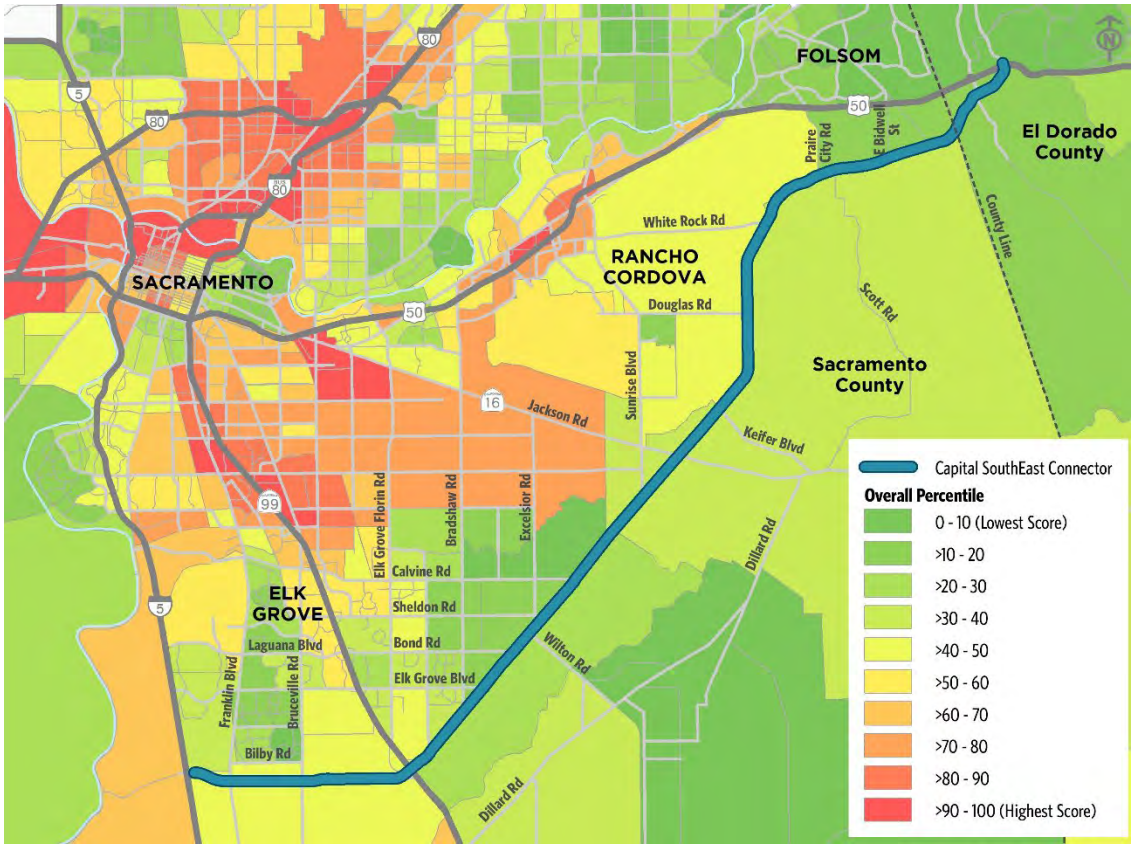
Definition

CalEnviroScreen was developed by the state's Office of Environmental Health Hazard Assessment (OEHHA) in 2013 and uses multiple indicators to identify pollution burden and vulnerabilities in California communities[17]. The screening tool includes individual percentile scores for each indicator as well as an overall calculated score. The recent update (CES 4.0) uses data from 21 indicators of pollution, environmental quality, and socioeconomic, and public health conditions to calculate a CES percentile score that can be used to determine environmental burdens and vulnerabilities for census tracts relative to others in the state.

Project Relevance

There is a pattern of environmentally burdened communities along the highways in Sacramento, including a concentration of high scoring CalEnviroScreen tracts in south Sacramento and along US 50 between Jackson Road and Sunrise Boulevard. These communities are likely to benefit from the reduction of VMT modeled to occur along these highways as was discussed in the Equity Analysis within the memorandum. Communities along the Connector alignment are some of the least environmentally burdened on the CES scale in south Sacramento County.

CalEnviroScreen 4.0



Source: California Office of Environmental Health Hazard Assessment

[17] https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

Regional Criteria

SACOG DISADVANTAGED COMMUNITIES

Definition

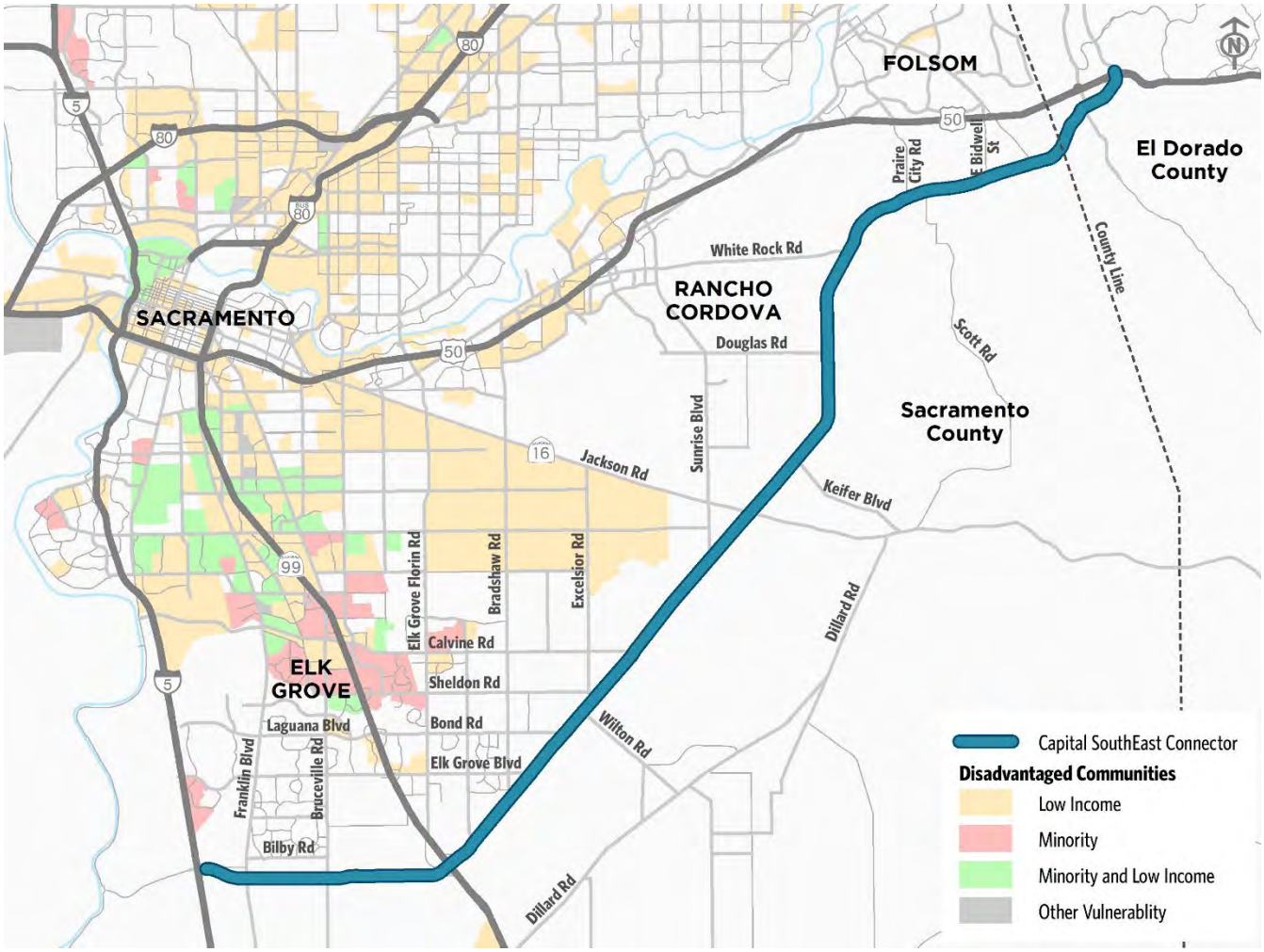
This dataset from the Sacramento Area Council of Governments (SACOG) Open Data Portal represents minority, low-income, and "other" vulnerable communities within the region where "other" includes measures such as individuals over age 75, linguistically isolated households, and concentrations of households with at least one person with a disability.[18] CalEnviroScreen was also used to help define eligible tracts. The SACOG 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTS/SCS) Appendix H: Environmental Justice Analysis describes the disadvantaged communities methodology and breakdown by geographic region in detail. According to the MTP/SCS analysis, roughly 38% of the region's population lives in the defined disadvantaged communities. SACOG's disadvantaged communities dataset was developed in collaboration with their Equity Working Group.

Project Relevance

Like the vulnerable communities identified by the federal and state screening tools, the 2020 SACOG Disadvantaged Communities are clustered largely along the freeway corridors (I-5, SR-99, and US 50 within the vicinity of the connector), as well as along SR 16 (Jackson Road). The disadvantaged communities indicated in the Elk Grove and North Vineyard areas are situated to benefit from no longer requiring significant out-of-direction travel to make connections to the northeast communities in Rancho Cordova, Folsom, and El Dorado Hills.

[18] https://data.sacog.org/datasets/2020-disadvantaged-communities-1/explore?location=38.816733%2C-121.563890%2C9.00

SACOG Disadvantaged Communities



Source: SACOG 2020 MTP/SCS

Local Criteria

SACRAMENTO COUNTY ENVIRONMENTAL JUSTICE COMMUNITIES

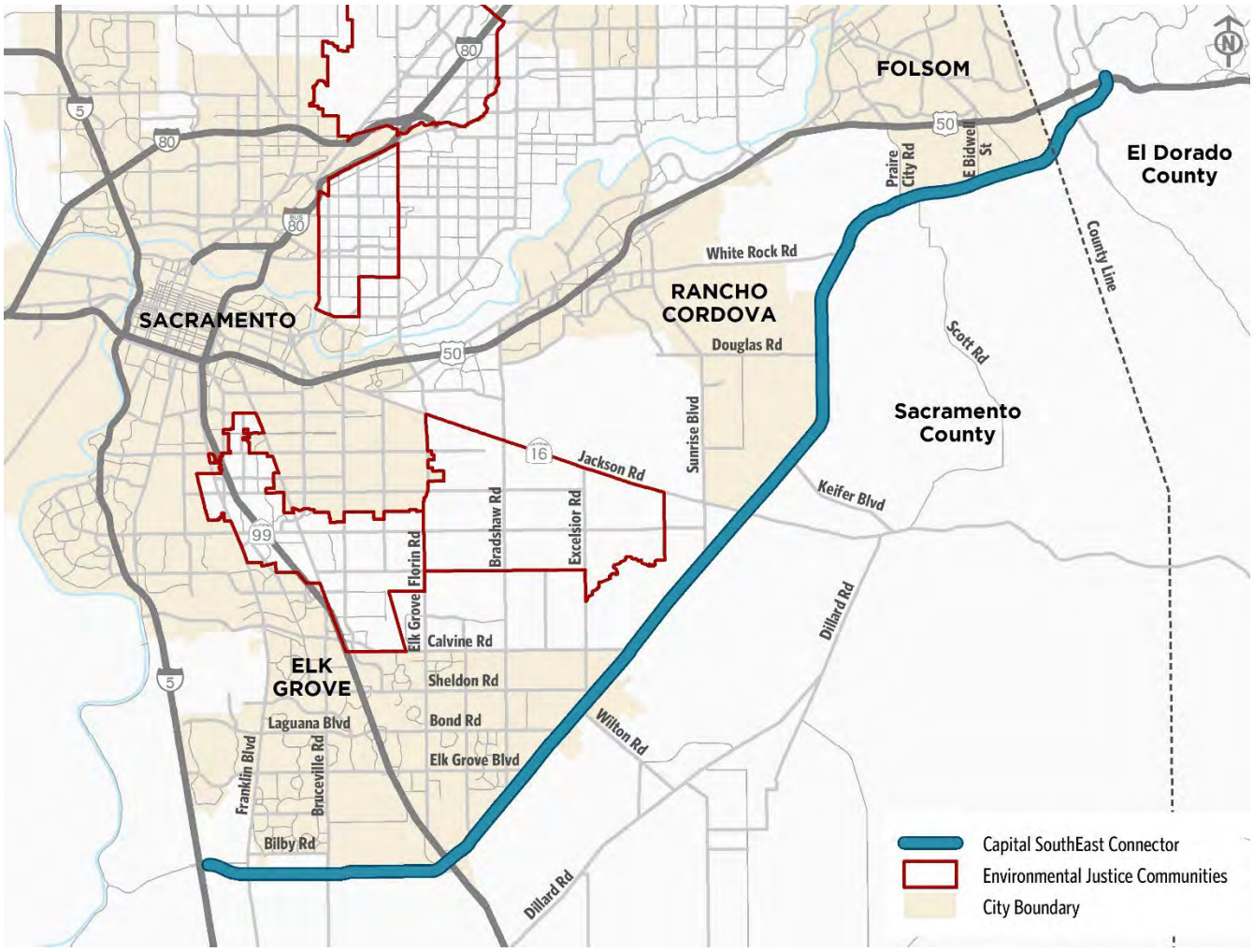
Definition

Sacramento County's 2030 General Plan Environmental Justice Element (EJ Element) identified environmental justice communities within the County using two sources: (1) the top 25% scoring census tracts from CalEnviroScreen 3.0 and (2) SACOG's 2016 MTP/SC "low income high minority" (LIHM) areas.

Project Relevance

The EJ element identified four EJ Communities: North Highlands/Foothill Farms, North Vineyard, South Sacramento, and West Arden-Arcade. Two Sacramento County EJ Communities – North Vineyard and South Sacramento – are located along major roadways in areas that have been consistently identified as environmentally and socially vulnerable that would see indirect benefits from air quality improvements along the state routes and direct access benefits from reduced out of direction travel to the communities of Elk Grove, Rancho Cordova, Folsom, and El Dorado Hills.

Sacramento County EJ Communities



Source: Sacramento County 2030 General Plan

Appendix B. 2020 SACOG MTP/SCS Developing Communities and Housing Calculations

As part of the 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS), SACOG prepared a regional growth forecast for population, employment, and households and delineated by community type (2020 MTP/SCS Appendix C) . The data used in the calculations below and cited in the memorandum is calculated using the 2020 MTP/SCS Preferred Scenario 2040 jobs and housing units modeling for "developing communities" determined to be in proximity to the Connector. These jobs and homes are expected to benefit from the Connector's implementation, improving mobility and connectivity for those areas.

A table depicting the resulting assumptions and calculations founded in the MTP/SCS Appendix C data is below.

Developing Communities Jobs and Housing Calculations

	Total Growth		% change	
	Jobs	Housing	Jobs	Housing
	13580	36560	794%	450%

DEVELOPING COMMUNITY	Baseline 2016		2020 MTP 2016 to 2040		# Growth		% Growth	
	Jobs	Housing	Jobs	Housing	Jobs	Housing	Jobs	Housing
El Dorado County								
Bass Lake Hills	80	100	110	1140	30	1040	38%	1040%
Carson Creek	40	460	250	1700	210	1240	525%	270%
Valley View	150	1390	150	2840	0	1450	0%	104%
Elk Grove								
Lent Ranch	170	0	3170	280	3000	280	1765%	100%
Southeast Planning Area	10	30	4000	4030	3990	4000	39900%	13333%
Sterling Meadows	0	0	0	1180	0	1180	100%	100%
Folsom								
Folsom South Area	0	0	2000	6700	2000	6700	100%	100%
Rancho Cordova								
Ranch at Sunridge	0	0	0	700	0	700	100%	100%
Rio Del Oro	0	0	1500	5000	1500	5000	100%	100%
Suncreek	0	0	200	3200	200	3200	100%	100%
Sunridge	600	3740	2090	7990	1490	4250	248%	114%
Sacramento County Unincorporated								
Glenborough at Easton	10	0	810	3230	800	3230	8000%	100%
Mather South	0	0	260	1810	260	1810	100%	100%
Vineyard Springs	650	2400	750	2880	100	480	15%	20%
Cordova Hilla	0	0	0	2000	0	2000	100%	100%

Source: SACOG 2020 MTP/SCS

ITEM 12

MEETING DATE: May 27, 2022

TITLE: Update on Sustainability Benefits of the Connector Project (Receive and File)

PREPARED BY: Matt Lampa

RECOMMENDATION

Receive an update on sustainability benefits related to the Connector project.

BACKGROUND

Staff has been working with Kittelson & Associates, Inc. ("Kittelson") to analyze how the Connector project aligns with federal, state, and regional goals related to sustainability. The analysis utilizes resources to define "sustainability" within the context of transportation projects, and how constructing the Connector is a strategy that helps create a more sustainable region. Addressing sustainability has become an important criterion for transportation projects.

EXECUTIVE SUMMARY

The Connector has been designed towards federal, state, and regional sustainability visions of considering the triple bottom line of social, environmental, and economic impacts, and supporting the future transportation and land use network envisioned in planning efforts for the Sacramento region:

- The Connector supports regional planning efforts to increase housing and multi-modal mobility while integrating conservation and preservation.
- The Connector provides social, economic, and mobility benefits for a growing population.
- The Connector reduces greenhouse gas emissions and improves air quality.
- The Connector conserves energy and non-renewable resources.
- The Connector minimizes impacts to land and natural resources.

DISCUSSION

FHWA's Infrastructure Voluntary Evaluation Sustainability Tool ("INVEST") measures sustainability by "assessing performance of Social, Environmental, and Economic principles". According to FHWA, a sustainable highway maximizes societal development and economic growth while reducing negative impacts to the environment and consumption of natural resources.

Solution	Category	INVEST Criteria	Action Taken
Life-Cycle Cost Analyses (materials/resources)	Project Management	✓	Pavement life-cycle cost analysis prepared during design
Historical, Archaeological and Cultural Preservation (educational opportunities)	Project Management	✓	Included in environmental documentation
Low Impact Development (Stormwater BMPs)	Project Management	✓	Water quality swales and basins included planned
Access to Agricultural Land	Project Management		Agricultural preservation a key component of the SSHCP
Context Sensitive Project Development	Project Delivery Process	✓	Wildlife crossings planned at two locations, existing drainage channels for hydromodification where feasible, special design approach for Segment C through the Sheldon community, developed through extensive public involvement
Tracking Environmental Commitments	Project Delivery Process	✓	Completed with all segments constructed and required as part of the environmental documentation and SSHCP
Habitat Restoration	Inter-Agency Agreements	✓	JPA is a plan partner and permittee of SSHCP, focused on habitat restoration and access to agricultural land
Access to Agricultural Land	Inter-Agency Agreements		JPA is a plan partner and permittee of SSHCP, focused on habitat restoration and access to agricultural land

Solution	Category	INVEST Criteria	Action Taken
Regional Bicycle System Connectivity	Inter-Agency Agreements		Multi-use path along Connector is integrated into member agency and SACOG's master bike plans, and ties into existing and planned trail networks
Energy Efficiency	Electrical	✓	LED lighting used on all traffic signals and streets lights
Habitat Restoration Ecological Connectivity	Environment	✓	JPA is a plan partner and permittee of SSHCP, focused on habitat restoration and access to agricultural land. Two wildlife crossings are planned as part of the Connector project.
Reduce Diesel Particulate Matter Exposure	Environment		Connector expected to reduce regional congested, resulting in a similar reduction in criteria pollutants regionally.
Trees for Air Pollution Impact Reduction	Environment		Connector Landscape plan includes planting of trees.
Site Vegetation Shade Canopy	Landscape	✓	Connector Landscape incorporates these items
Reduce and Reuse Materials	Materials/Resources	✓	RHMA used on several segments already constructed and will be used on future segments when feasible.
Earthwork Balance	Materials/Resources	✓	Design always try to balance site when feasible
Long-Life Pavement Design	Pavement	✓	Pavement designed for 20-year design life or greater
Quiet Pavement	Pavement		RHMA used on several segments already constructed and will be used on future segments when feasible.
Pedestrian Access Bicycle Access	Roadway Design	✓	Multi-use path connects to other Class I and II facilities, as well as development adjacent to the corridor and transit facilities.

SUMMARY

The Sustainability Performance Benefits memorandum demonstrates that the Connector project has been designed towards the goals of a Sustainable Highway, as defined by the FHWA.

It maximizes "societal development and economic growth while reducing negative impacts to the environment and consumption of natural resources" (FHWA, INVEST).

It considers the triple bottom line of social, environmental, and economic impacts, supporting the future transportation and land use network envisioned in planning efforts for the Sacramento region.

The project supports numerous sustainability best practices identified by FHWA through the INVEST program, going beyond the basic requirements to support "safety, mobility, environmental protection, livable communities, [and] asset management" (FHWA, INVEST).

ATTACHMENTS

a. Key Takeaways
b. Sustainability Performance Benefits Memorandum, dated May 2022

ITEM 12 a

I. KEY TAKEAWAYS

SUSTAINABILITY PERFORMANCE BENEFITS

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

HOW DOES THE CONNECTOR SUPPORT SUSTAINABLITY?

INTEGRATE TRANSPORTATION & LAND USE PLANNING

- Reduction in travel distances and increased accessibility to newly developing communities
- Context-sensitive roadway design to support multimodal travel options
- Integrated planning with Kammerer corridor land use planning to support sustainable living and travel
- Integrated conservation and preservation planning to support new growth while minimizing environmental impacts and supporting existing natural habitat in South Sacramento

PROVIDES SOCIAL AND ECONIMIC BENEFITS

- Increased access and mobility for people and goods
- Construction adds to economic output of the region, and project will serve as catalyst for new economic activity
- Increased attractiveness of the region for investment in new housing and improved connection with employment and population centers.
- Improved safety performance of the corridor

REDUCES GREENHOUSE GAS EMISSIONS

- Reduction in regional vehicle miles traveled
- Incorporating smart corridor technology and traffic capacity improvements to improve traffic flow and reduce congestion
- Walking, biking, facilities to promote transportation choices
- Electric Vehicle Strategy to promote electric vehicle use

CONSERVES ENERGY AND NON-RENEWABLE RESOURCES

- Energy Star-compliant luminaires and solar panels to reduce energy requirements
- Smart lighting technology to reduce energy use when there is no activity at night
- Recycled materials and low-emission strategies during construction

MINIMIZES THE IMPACT TO LAND AND NATURAL RESOURCES

- Stormwater management that improves water quality and ecological connectivity
- Landscaping with native, drought-tolerant plant species
- Roadway alignment that protects and preserves wildlife passage
- Retaining walls to reduce right-of-way width requirements and minimize impact on adjacent natural terrain

ITEM 12 b

KITTELSON & ASSOCIATES

2510 J Street, Suite 200
Sacramento, CA 95816
P 916.266.2190

MEMORANDUM: Sustainability Performance Benefits

May 17, 2022 Project #: 27098

To: Matt Lampa, PE, Principal Civil Engineer
Capital SouthEast Connector JPA
10640 Mather Blvd., Suite 120
Mather, CA 95655

CC: Derek Minnema, PE, Executive Director

From: Matt Braughton, RSP; Kelly Lausten; Mike Aronson, PE; and Allison Woodworth
Kittelson & Associates, Inc.

RE: Connector Project Performance Benefits Study – Sustainability Performance

Executive Summary

This memorandum provides an overview of the memorandum and the benefits of the Capital SouthEast Connector (Connector) project. Sustainability benefits associated with the Connector include:

> "The first rule of sustainability is to align with natural forces, or at least try not to defy them."
>
> —Paul Hawken

1. **Integrating transportation land use planning**, supporting regional planning efforts and increasing access to newly developed communities while integrating conservation and preservation.
2. **Providing social and economic benefits** by increasing access and mobility for people and goods, and making the region more attractive for investment.
3. **Reducing greenhouse gas emissions** by reducing regional vehicle miles traveled, incorporating smart corridor technology, providing high-quality pedestrian and bicycle facilities, and promoting electric vehicles.
4. **Conserving energy and non-renewable resources**, with strategies like Energy Star-compliant luminaires and solar panels, smart lighting technology, and environmentally-preferred and recycled materials.
5. **Minimizing the impact to land and natural resources** by integrating green infrastructure design elements and designing the roadway to engage with the local environment instead of replacing it. Design elements include stormwater management; native, drought-tolerant plant species; wildlife crossings; and habitat conservation.

The memorandum includes the following sections:

The following page summarizes the key takeaways from the sustainability analysis.

I. KEY TAKEAWAYS

SUSTAINABILITY PERFORMANCE BENEFITS

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

HOW DOES THE CONNECTOR SUPPORT SUSTAINABLITY?

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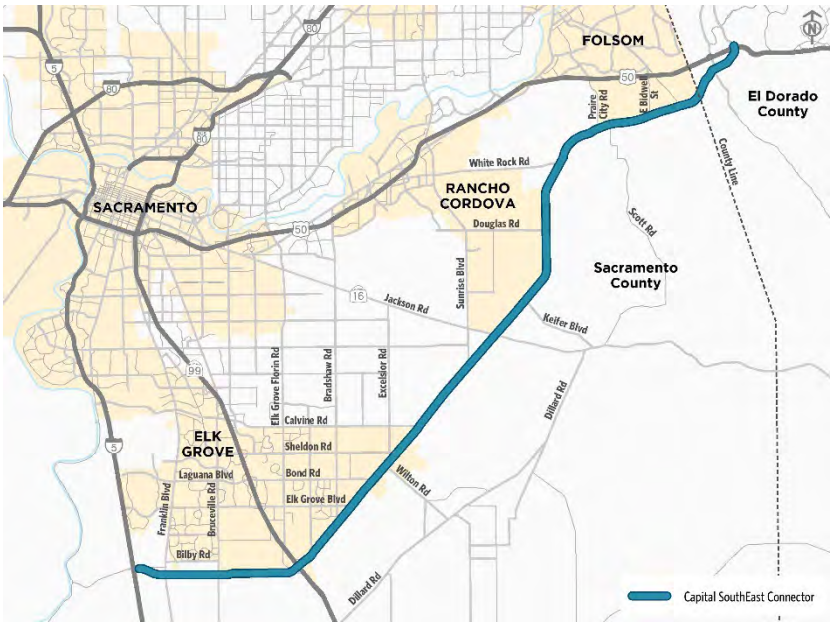
II. Project Background

The Capital SouthEast Connector (Connector) is a 34-mile multimodal facility southeast of the City of Sacramento that extends from Interstate 5 (I-5) in Elk Grove to US Highway 50 (US 50) in El Dorado County. While the Connector includes some new sections of roadway, the majority of its alignment is existing roadways which will be upgraded as part of the overall project.

The ultimate Connector design includes four to six travel lanes, a separated multiuse path, landscape median, and limited access points. Existing roadways that make up the connector include Kammerer Road, Grant Line Road, and White Rock Road. While the Connector has distinct segments identified for construction phasing, the connector as a whole is considered when evaluating environmental sustainability.

The Connector is the primary regional transportation route that serves broader transportation and land use planning and conservation efforts in southeast Sacramento County. The Connector is a multimodal facility connecting Elk Grove to the south and Folsom and El Dorado Hills to the north. The area between these urbanized and growth areas has been subject to several conservation and preservation efforts. The Connector provides a much-needed transportation link, enhancing regional connectivity while minimizing impacts, preserving open space, and protecting threatened habitats.



III. What is Sustainability?

The Federal Highway Administration (FHWA) program, INVEST (Infrastructure Voluntary Evaluation Sustainability Tool), defines sustainability as the “capacity to endure” and considers the triple bottom line of social, environmental, and economic impacts. A key component of sustainable transportation is “maintaining or improving the well-being of the environment on which life depends” (FHWA). Key transportation strategies that promote sustainability include projects that:

> A sustainable highway should satisfy lifecycle functional requirements of societal development and economic growth while reducing negative impacts to the environment and consumption of natural resources.
>
> - FHWA

- Provide social and economic benefits,
- Reduce greenhouse gas emissions,
- Conserve energy and non-renewable resources, and
- Minimize the impact to land and natural resources.

These strategies are discussed in the sections that follow and demonstrate how the Connector supports sustainability.

IV. Alignment with Regional Plans

The Connector project serves as a key transportation connection that facilitates the broader transportation and land use planning within the Sacramento region. The project's alignment with regional plans is discussed below.

SACRAMENTO AREA COUNCIL OF GOVERNMENTS (SACOG) 2020 METROPOLITAN TRANSPORTATION PLAN/SUSTAINABLE COMMUNITIES STRATEGY (MTP/SCS)

The SACOG 2020 MTP/SCS is a 20-year multimodal transportation plan and land use strategy. As described in the plan:

> "The 2020 MTP/SCS lays out a transportation investment and land use strategy to support a prosperous region, with access to jobs and economic opportunity, transportation options, and affordable housing that works for all residents. The plan also lays out a path for improving our air quality, preserving open space and natural resources, and helping California achieve its goal to reduce greenhouse gas emissions that contribute to climate change."

The Connector project is one of the major road and highway capacity projects included within the MTP/SCS to facilitate SACOG's fiscally constrained transportation and land use plan. The majority of the Connector project segments are included in the fiscally constrained plan with Segments C, D1, and D2 included for project development purposes only at this time due to regional funding estimate limitations.

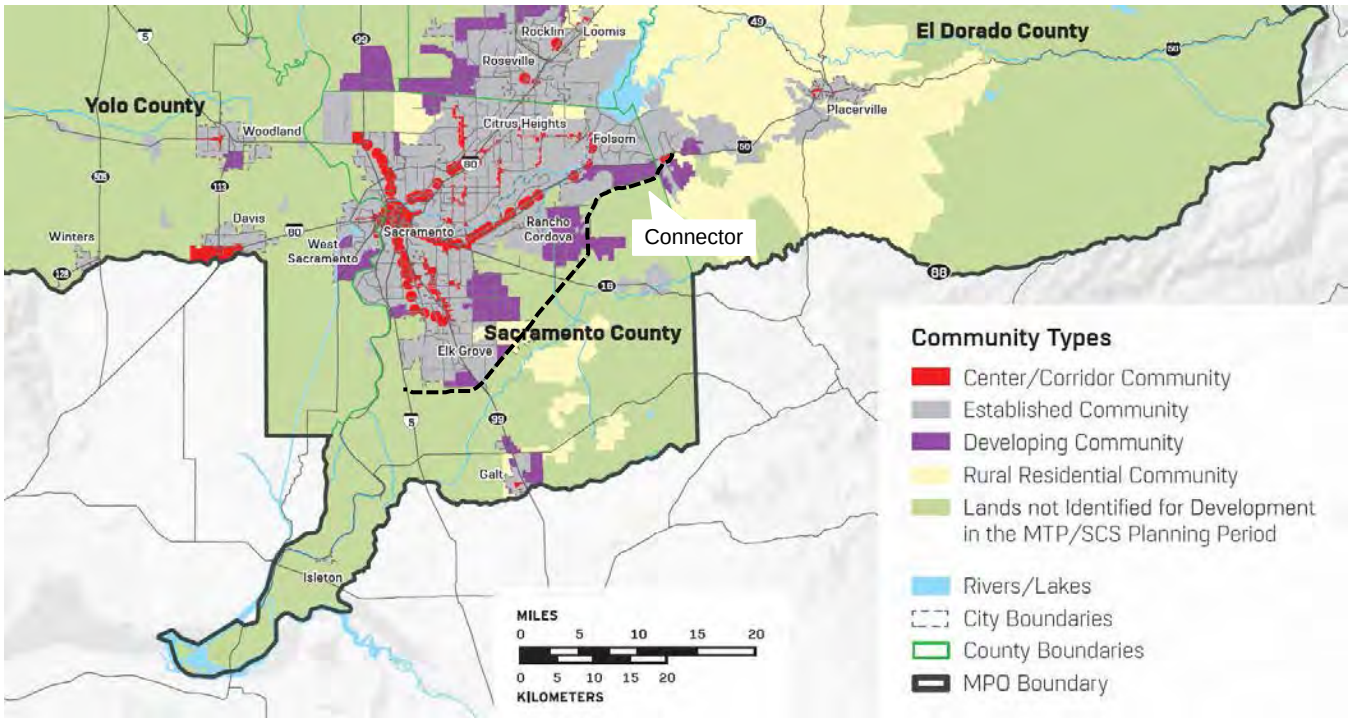
As part of the MTP/SCS, the Connector project improvements contribute to meeting development and economic accessibility needs while also meeting federal and state air quality and greenhouse gas emissions targets. The Connector project helps facilitate access between the urban centers where nearly two-thirds of the region's new housing and 85 percent of its job growth are expected.

As shown in Figure 1, the Connector will serve as a link between the established communities of Elk Grove, Folsom, and El Dorado Hills and facilitate access to the developing communities surrounding the current urbanized areas of Elk Grove, Rancho Cordova, Folsom, and El Dorado Hills. As a regional facility, the Connector reduces travel times between these communities and beyond. As documented in the September 2021 memorandum, Travel Demand Model (TDM) Update Summary, produced by Kimley Horn and validated through an independent peer review by Kittelson & Associates, Inc. as part of this study, the JPA developed a TDM for the Connector to assess anticipated changes with the project. Based on the model, "the addition of the Connector results in a net decrease of 998 daily VHT [vehicle hours traveled] within the region. This is primarily due to vehicles using the Connector as an alternative to congested US-50 and SR-99 roadways."

Combined with the preservation and conservation efforts described in the following sections, the Connector provides transportation access and connectivity while also helping preserve and maintain the natural resources and agricultural lands surrounding established and developing communities. As further described in the next section, the Connector JPA is working to preserve natural habitat and has secured 160 acres of conservation

easement to maintain environmental habitats as well as farmland to support regional agricultural land uses in perpetuity.

Figure 1: Connector Area SACOG MTP/SCS Community Types

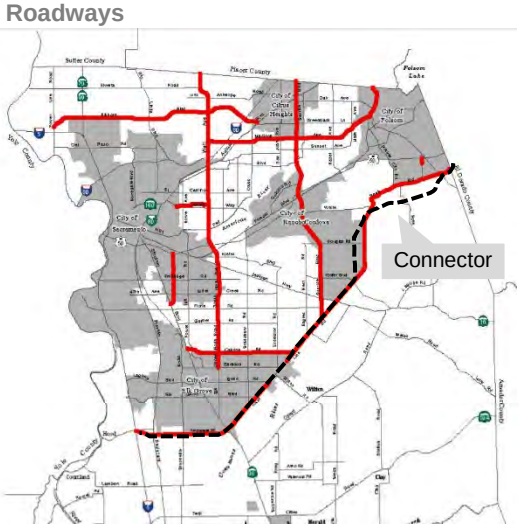


Source: SACOG 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy.

SACRAMENTO COUNTY GENERAL PLAN

The Sacramento 2030 General Plan guides growth and development within the unincorporated County over a 20-year planning horizon. It includes strategies focused on economic growth, environmental sustainability, addressing existing issues and needs, and establishing the framework for accommodating future growth. As shown in Figure 2, the Connector is one of the critical transportation improvements identified in the General Plan as a multimodal limited-access facility to enhance mobility options and accessibility, connect existing and planned job centers and commercial areas, and preserve open space, wildlife habitat, and production agriculture.

Figure 2: Sacramento County General Plan Limited Access Roadways

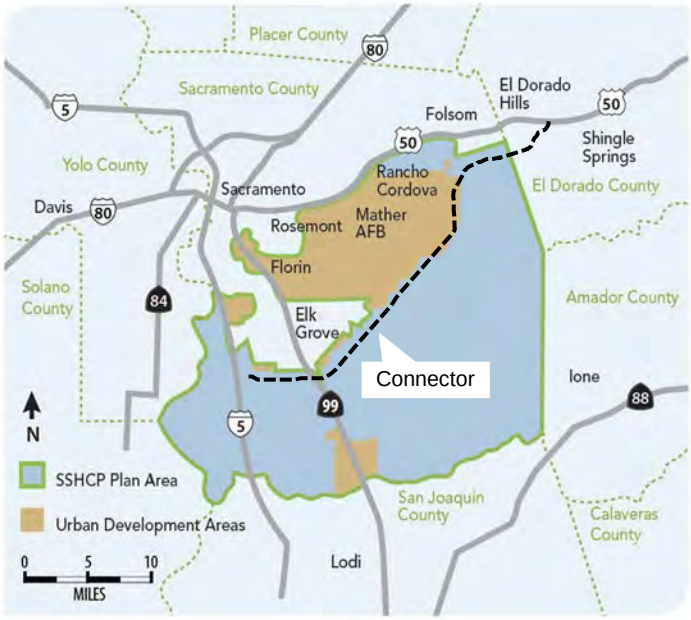


As noted in the General Plan, the Connector project limits access to the facility in order to limit growth outside the planned growth communities and sustain the surrounding habitat and agricultural and business activities. By limiting access outside of planned growth areas, the Connector contributes to reducing sprawl that could impact the sensitive habitats, wildlife, and agricultural business sustainability in Southeast Sacramento County. The Connector serves as a regional link, providing access while still supporting sustainable development.

SOUTH SACRAMENTO HABITAT CONSERVATION PLAN

The South Sacramento Habitat Conservation Plan (SSHCP) is a regional effort that provides development and infrastructure projects with streamlined, predictable county and State permitting processes while creating a Preserve System to protect habitat, species, aquatic resources, open space, and agricultural lands in South Sacramento. The plan area includes a total of 317,656 acres and is intended to "preserve 28 species of plants and wildlife, including 11 that are listed as threatened or endangered…" (SSHCP). Its mission includes "ensure the long-term viability of Covered Species in the Plan Area by preserving an adequate quality and quantity of habitat in an integrated regional manner and contribute to species recovery."

Figure 3: SSCHP Plan Area and Urban Development Areas



Source: South Sacramento Habitat Conservation Plan Fact Sheet.

Source: Sacramento County General Plan of 2005-2030

The SSHCP was prepared by five local agencies, including the Connector JPA, to coordinate regulatory permits from federal agencies. This coordination ensures the creation of large, interconnected preserves that are sustained in perpetuity by an adequately funded management program. It includes portions of unincorporated Sacramento County, Galt, and the southern half of Rancho Cordova, totaling 36,282 acres (see Figure 3). The SSHCP Conservation Strategy includes protecting natural waterways, managing preserved lands, maintaining biological diversity and watershed functions, and reestablishing or establishing land cover and riparian or other aquatic land.

The SSHCP is the first plan in the nation to combine permits from the U.S. Army Corps of Engineers for the Clean Water Act and the U.S. Fish and Wildlife Service for the Endangered Species Act and allow most permitting to occur through the County Office of Planning and Environmental Review given the preservation and conservation agreement. The plan defines the Urban Development Area (UDA) that will contain all proposed urbanization development with some natural preserves within these areas, while the areas outside the UDA will contain the bulk of the preservation efforts and help protect agricultural lands and habitat.

> "The Capital SouthEast Connector Project… aims to create a 34-mile expressway to provide congestion relief and economic connectivity to three cities and two counties in the greater Sacramento region… This project would connect the greater Sacramento region's rural communities to major arterial roadways while also preserving natural habitat and highly productive agricultural lands. That is why the project has been integrated into the South Sacramento Habitat Conservation Plan: a regional coherent strategy for supporting greater Sacramento's rapid growth while preserving open space."
>
> – US Representative John Garamendi (D)

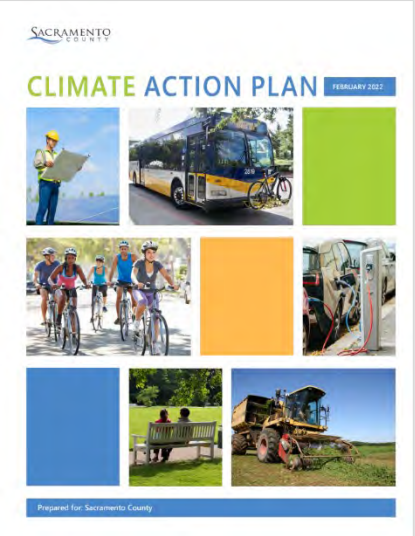
Key benefits from the SSHCP include:

- Improves species and aquatic protection on a regional scale
- Integrates Clean Water Act and Endangered Species Act permitting
- Moves decision-making to the local level and provides greater certainty for regulation
- Ensures the long-term viability of 28 plant and wildlife species

The SSHCP is managed by a Joint Powers Authority (JPA) called the South Sacramento Conservation Agency that includes the three local jurisdictions, the Sacramento County Water Agency, and the Capital SouthEast Connector JPA. The JPA will help oversee and monitor the cooperative agreements with entities to own and manage the preservation and conservation easements within the SSCHP. The SSHCP identifies a plan and responsible agency for the long-term analysis of biological resources, conservation strategies, management of future growth with appropriate conservation efforts to maintain and preserve open space, habitat, and agricultural lands.

SACRAMENTO COUNTY CLIMATE ACTION PLAN

The County of Sacramento has developed its own Climate Action Plan (2022). This plan recommends various strategies for implementation in the Sacramento region for combating the effects of climate change, such as increased temperatures, wildfires, drought, flooding, and sea-level rise. This plan also identifies major initiatives within the 2005-2030 Sacramento County General Plan that address climate-related hazards. Among other components, the Capital SouthEast Connector is identified as one of the General Plan's elements that will encourage sustainable building practices, efficient use of resources, and ecological stewardship. Specifically, the Connector project is identified as a key facility to serve the future growth within the County's Urban Services Boundary (USB) while outside the USB, the County will limit access to and from the Connector roadway to only accommodate existing and future land uses permitted outside the USB.



V. Connector Project Supports Sustainability

The Connector provides connectivity and mobility while supporting sustainability in the region. Specific environmental benefits are discussed below, organized into project outcomes that:

1. Provide social and economic benefits,
2. Reduce greenhouse gas emissions,
3. Conserve energy and non-renewable resources, and
4. Minimize the impact to land and natural resources.

PROVIDING SOCIAL AND ECONOMIC BENEIFTS

The FHWA program, INVEST states that "one must also consider the social and economic benefits that our highways provide, including access, mobility, and the economic benefits of moving people and goods." One way to measure the social and economic benefits of a project is an economic impact analysis. Varshney & Associates

prepared an Economic Impact of the Capital Southeast Connector to “measure the direct, indirect, and induced benefits associated with building the Connector.” The analysis includes the following findings:

- “The construction of the Connector... will add to the economic output of the seven county Region, act as a catalyst for new economic activity, create new jobs, add to the labor income, produce net new taxes on production and imports, and in general add to the gross state product of the Region.”
- “… making the Region more attractive for investment in new housing construction due to creating new options for transportation and commuting. The easier connection between employment and population centers will contribute to the vibrancy of the local economy.”
- “The improvement in ease and speed of transportation of goods will lead to the increased economic vibrancy of the Region leading to higher growth and prosperity."

> In 2021 NPV dollars, a $340 million investment in the Connector construction would create a gross economic impact (to include direct effects, indirect effects, and induced effects) of $552.5 million of economic Output, 2,961 new full-time equivalent Employment of jobs, $220.6 million in new Labor Income, $334.8 million of new Value Added in the regional economy, and generate $25.3 million in new Taxes on Production and Imports for the seven county Region. This total impact, as measured over the duration of the actual period of construction, would provide a significant economic boost to the Region.
>
> Varshney & Associates, The Economic Impact of the Capital Southeast Connector

In terms of social benefits, FHWA notes that "safety has a unique role in sustainability as a key component of the social principle of the triple bottom line.” The safety analysis conducted for the Connector project as part of this study concluded that the project is expected to reduce overall reported crashes by approximately 25 percent, considering existing crash history, trends, and roadway volumes. Safety improvements include providing wider shoulders and a clear recovery area to address run of the road crashes, access control to reduce potential conflicts between turning vehicles and through movements, and a multi-use path to separate pedestrians and bicyclists from vehicles (Kittelson, 2022).

REDUCING GREENHOUSE GAS EMISSIONS

> The U.S. transportation sector—which includes cars, trucks, planes, trains, and boats—generates the largest share of greenhouse gas emissions.[1]

Providing additional travel options for reducing single-occupant vehicle travel helps reduce greenhouse gas (GHG) emissions. In addition, increasing the efficiency of and reducing trip distances for daily vehicle commutes and how products and goods move through the network reduces vehicle miles traveled (VMT) and congestion. The Connector has several features that help reduce greenhouse gas (GHG) emissions:

- Reducing travel distances and congestion to reduce GHG impacts

[1] https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#:~:text=The%20largest%20source%20of%20greenhouse,electricity%2C%20heat%2C%20and%20transportation.

- Expanding freight route options to provide redundancy and provide more efficient goods movement
- Integrating a smart corridor to incorporate emerging technologies and develop an electric vehicle (EV) strategy to support EVs along the corridor

Reducing Vehicle Miles Traveled and Emissions

The Connector supports regional goals by improving mobility for all modes, specifically the SACOG goal to "build and maintain a safe, reliable, and multimodal transportation system" (2020 MTP/SCS). Mitigating congestion and improving traffic operations along the Connector provides a more direct route for commuters and goods movement and reduces emissions from congestion. This results in reduced vehicle miles traveled and an overall decrease in GHG.

> The memorandum *Travel Demand Model (TDM) Update Summary* (September 2021) documents the results of travel demand modeling for the Connector, developed by Kimley Horn and peer reviewed by Kittelson. The memorandum indicates "the construction of the Project will not result in additional regional VMT and/or to the extent it is, it is likely negligible in terms of affecting the transportation system or State of California environmental goals." In addition, regional congested VMT are expected to decrease by 0.74 percent with the Connector, "primarily due to vehicles using the Connector as an alternative to congested US-50 and SR-99 roadways." Congested VMT is an important consideration, as congestion is a "significant contributor to GHG and other air quality concerns, given the stop-and-go nature of roadways over capacity."

The Connector includes a Class I multiuse path along most of the corridor, with buffered bike lanes and sidewalks along some portions with adjacent development. This provides options for walking and biking along roadways that currently lack shoulders and few sidewalk facilities. The Connector multiuse path connects rural and growing communities along the corridor to a network of existing and planned trails, and will serve as an east-west backbone of the regional active transportation and trails system. This provides multimodal connectivity and travel options, as well as first and last mile connections that can be integrated with future mobility hubs, bus stops, or transit centers. Increasing transit access and trips can also reduce GHG emissions.

El Dorado Transit, in cooperation with El Dorado County Transportation Commission (EDCTC), is planning a new multimodal transit center adjacent to the corridor. The multimodal transit center will serve as a mobility hub, offering a range of transit options that are easily accessible by walking and biking, further encouraging transit ridership.

Furthermore, the Kammerer Road portion of the corridor, in Elk Grove, is being planned as the foundation for a walkable city. The City of Elk Grove put together a Kammerer Road Urban Design Strategies report in 2021, which proposes to transform the facility into a transit-oriented development corridor with more density and

diversity in land use and transit-oriented design. This plan directly addresses local and regional sustainability by using a "triple bottom line" approach to connect transportation and land use to address social equity, economic, and environmental factors to support sustainable development in Elk Grove. In particular, along this segment of the Connector, the supporting land use vision includes:

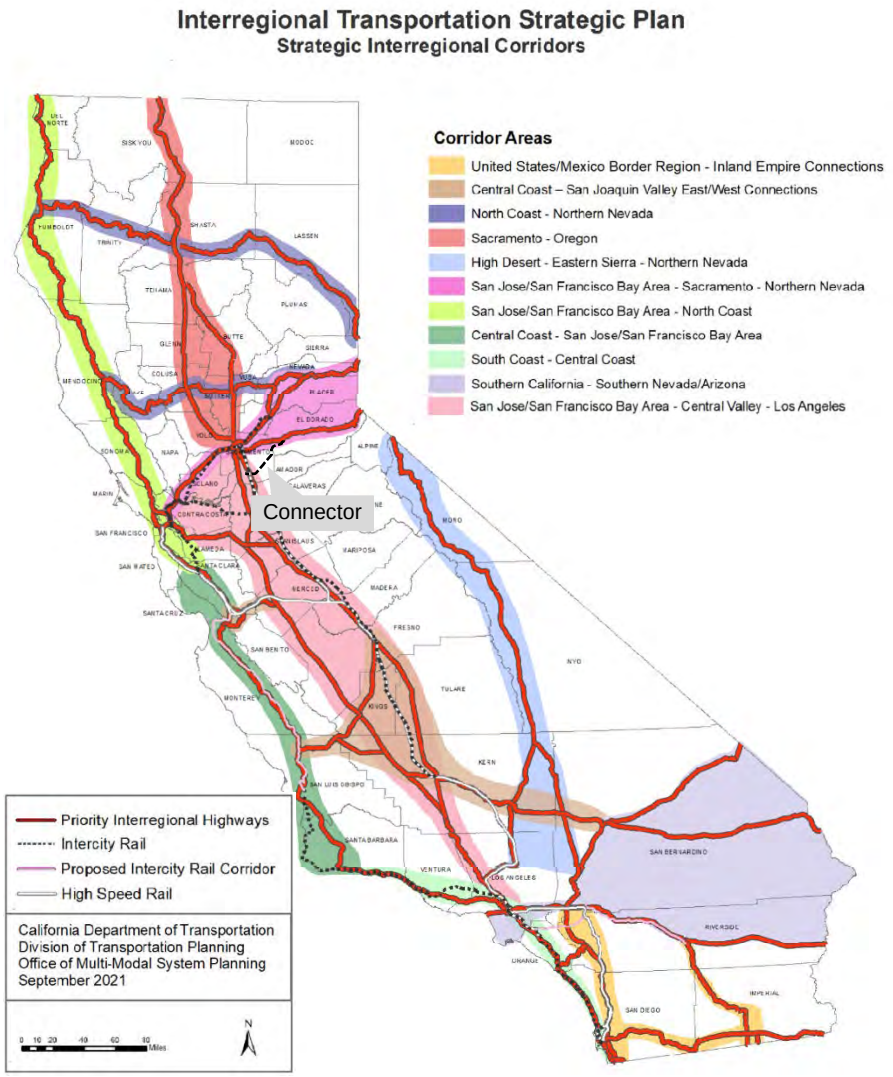
- Sustainable architecture to maximize energy efficiency and reduce environmental impacts of the built environment;
- Green parking lots to improve water quality, support groundwater supply through increased water filtration, minimize urban heat island effects, and provide effective stormwater management; and
- Green roofs and daylighting to provide additional energy efficiency benefits and reduce electricity requirements by providing natural light.

Expanding Freight and Interregional Routes

The Connector supports environmental sustainability by providing regional, statewide, and national connections between California's Strategic Interregional Corridors, as identified in the Caltrans *2021 Interregional Transportation Strategic Plan*. The plan provides a policy framework to guide Caltrans and partner agencies in the development of multimodal corridor plans that identify transformative, innovative, and cost-effective projects to guide interregional travel across the state.

The plan's vision is to create a safe, resilient, accessible and sustainable transportation network to equitably support healthy, diverse communities and the California economy. As shown in , the Connector will serve as a new interregional route, shortening interregional travel distances between the San Jose/San Francisco Bay Area–Central Valley–Los Angeles Strategic Interregional Corridor, and the San Jose/San Francisco Bay Area–Sacramento–Northern Nevada corridor. This will promote interregional goods movement and other activity while reducing travel times and regional VMT, reducing environmental impacts and facilitating more sustainable interregional travel and economic activity. Based on modeling for the

Figure 4: Strategic Interregional Corridors



Source: Caltrans DRAFT Interregional Transportation Strategic Plan, 2021.

Connector, it is expected to reduce regional VMT by 0.01 percent, congested VMT by 0.74 percent, and daily vehicle hours traveled by 0.04 percent (Kimley Horn, 2021).

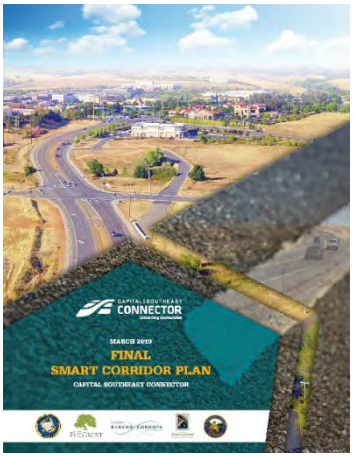
The Connector supports the *California Sustainable Freight Action Plan* (2016) objectives by:

- Increasing freight system efficiency and capacity by providing a new link between two strategic corridors;
- Reducing exposure to air toxins by providing a freight route away from urbanized areas to limit localized air quality impacts;
- Reducing VMT and GHG emissions to support federal and State clean air and climate change goals;
- Supporting freight system resilience by providing a secondary connection between the I-5, SR 99, and SR 50 corridors; and
- Supporting economic competitiveness and workforce development by providing regional connections between two major jobs centers in Elk Grove and the Folsom/El Dorado Hills communities.

The Connector addresses the needs and goals of the *California Freight Mobility Plan 2020* by helping alleviate freight bottlenecks and optimizing goods movement system performance within the Sacramento region and promoting economic development through increased system efficiency. It also addresses the plan's environmental stewardship and resiliency goals by reducing criteria pollutants and GHGs. Based on air quality modeling done for the Connector, the project is anticipated to reduce regional primary criteria pollutants between 0.73 and 0.75 percent and reduce regional carbon dioxide by 0.73 percent, due to the reduction in congested regional vehicle miles traveled (Rincon and Kittelson, 2022). The Connector increases freight resiliency by providing redundancy in the goods movement network and constructing an all-weather corridor to provide connections between I-5, SR 99, and SR 50. Additionally, the Connector's stormwater management facilities will accommodate 100-year storm events and reduce corridor flooding impacts, while expanding the corridor from a largely two-lane facility to four-lane facility provides added mobility.

Smart and Electric Vehicle Friendly Corridor

The JPA has taken additional steps to plan for smart and emerging technologies to help improve the long-term sustainability of the corridor as a regional connection. As part of this effort, the JPA developed the Connector-specific *Smart Corridor Plan* to identify technology-related infrastructure that will be integrated into the final design. This will enable the Connector to accommodate, test, and promote a broad range of transportation technologies and integrate with SACOG's Smart Region Sacramento *ITS Architecture* and *Technology and Mobility Master Plan*. The smart corridor concept includes strategies to address near-term and long-term efficiency in managing traffic demands, supporting redundancy and communication as a parallel route to SR 50 and SR 99, and providing infrastructure to communicate during emergency evacuation scenarios.



Recent construction of Segment B2 (Grant Line Road between Waterman Road Bradshaw Road) and D3a (White Rock Road from Bidwell Street to Payen Road) have included video detection, closed circuit television camera infrastructure, and signal interconnect.

The Connector will include implementation of established foundational ITS infrastructure and provide an opportunity to test emerging transportation technologies that could ultimately benefit both the Connector and the larger transportation system in the Sacramento region. The implementation of these Smart Corridor technologies will allow the Connector to adapt and adjust to emerging technologies as they penetrate the market by building the technology infrastructure backbone to support future communication needs.

Established ITS infrastructure includes:

For example, the broadband and communication infrastructure could support future connected vehicle technologies as vehicle-to-everything (V2X) technologies increase and allow communication between the Connector, traffic operations centers, and individual vehicles. By investing in these elements during construction, the Connector can increase the corridor's sustainability, providing for future enhancements and ensuring the roadway design is supportive of and as prepared as possible for future technologies.

An electric vehicle strategy is also being developed to identify a vision and goals to advance electric vehicle deployments along the Connector, which will help reduce GHGs. As noted in the air quality analysis done for the Connector, "Electric vehicles do not emit criteria pollutants or TACs that traditional internal combustion engine vehicles produce. Hybrid vehicles emit fewer pollutants than solely internal combustion-driven vehicles. As electric vehicles replace combustion engines on roadways, criteria pollutants and TACs that are concentrated around roadways will decline" (Rincon and Kittelson, 2022). As a part of this effort, the JPA has been coordinating with providers of electric vehicle charging stations to identify appropriate locations for future charging stations and coordinate these efforts with existing landowners along the Connector.

SACOG adopted the region's first plug-in electric vehicle readiness and infrastructure plan in December 2013, called TakeCharge. This commitment to "electrification of the region's transportation fleet" was reinforced in the Green Region Plan, which includes the goal of "Concentrated investment in electrification of the region's transportation fleet to demonstrate technologies and our region's interest in a zero-emission transportation future." Both plans support more robust regional charging infrastructure, which the Connector project contributes to.

TAKECHARGE
ELECTRIC VEHICLES IN THE SACRAMENTO REGION

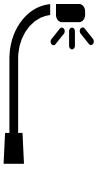
CONSERVING ENERGY AND NON-RENEWABLE RESOURCES

Energy can be conserved through the layout and options provided by the transportation network and through design features of the roadway components. Conservation efforts associated with the Connector include:

- In alignment with the Sacramento County 2030 General Plan's Energy Element, reducing travel distances and reliance on vehicles can decrease per capita energy consumption. The Connector supports this by

contributing to countywide regional vehicle miles traveled and vehicle hours traveled reductions[2] and providing multimodal facilities and opportunities for transit.

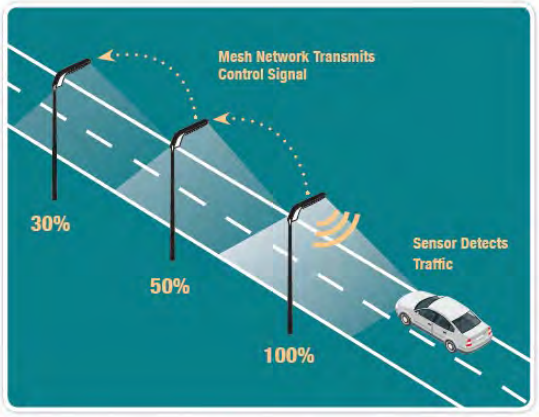
- As mentioned in the prior section, the Smart Corridor Plan and Electric Vehicle Strategy support new and emerging technologies that work towards corridor electrification and zero-emission infrastructure.



Recent construction of Segment B2 and D3a used LED lighting at all new traffic signals and street lighting.

- Lighting is planned at interchanges and intersections along the Corridor, as well as the multiuse path. Along the roadway, luminaires that meet Energy Star requirements will be used, with energy efficient light emitting diode (LED) technology. Solar panels will be used for illuminated signs to offset energy consumption. Along the multiuse path and sidewalks, the Connector is installing a smart lighting system that allows lights to dim during nighttime hours when there is no activity, reverting back to full output when motion is detected by sensors on the light poles. This feature helps conserve energy while still providing a lighted pathway for users.

Figure 5: Smart Lighting Concept



Source: Capital Southeast Connector Final Smart Corridor Plan

- Construction of the Connector will use environmentally preferred and recycled material where possible to reduce landfill waste and unnecessary use of resources. The Environmentally Preferable Purchasing and Practices Policy for the corridor includes implementation strategies and include engaging in waste prevention and practices, encouraging vendors to use recycled products, encouraging the use of products that reduce greenhouse gas emissions, and encouraging the use of energy-efficient products and equipment. Further, construction of the Connector will use local materials to minimize the need for extra transport distances and reduce fossil fuel equipment when feasible. As an example, the Connector will use recycled materials and/or rubberized hot mix asphalt (RHMA) paving made from recycled tires to assist in reducing traffic noise while reusing available resources, when feasible. RHMA has been successfully used on several segments already, including on Segment A2 (Grant Line Road from Bruceville to CA-99) and Segment B2 (Grant Line Road from Waterman Road to Bradshaw Road).

The Connector's Environmentally Preferable Purchasing and Practices Policy States:

The purpose of this policy is to identify Environmentally Preferred Products and Recycled Products and to assess their feasibility of use in connection with JPA activities in an effort to minimize negative environmental impacts; conserve natural resources, materials and energy; generate less waste material; reduce toxicity; and maximize recyclability and recycled content.

- Early project development for the Connector included a Sustainable Concept Committee (SCC) that provided an initial assessment of best practices for integrating sustainability into the planning, design, and construction of the Connector. The SCC provided a table of Sustainable Solutions, which have been incorporated into other project documents, including the Design Guidelines, SMART Corridor Plan, and Landscape Master

[2] Based on modeling work done for the Connector and peer reviewed by Kittelson, the project is expected to decrease regional vehicle miles traveled by 0.1% and regional vehicle hours traveled by 0.04% (Kimley Horn, 2021).

Plan. These solutions include significant overlap with the FHWA's criteria for sustainable project development, provided as part of the INVEST program (included in Appendix A). Example solutions that have been implemented are provided in Table 1.

Table 1. Sustainable Solutions from Sustainability Assessment and Resulting Actions

Solution	Category	INVEST Criteria	Action Taken
Life-Cycle Cost Analyses (materials/resources)	JPA/Project Management	✓	Pavement life-cycle cost analysis prepared for Segment D3a
Historical, Archaeological and Cultural Preservation (educational opportunities)	JPA/Project Management	✓	Included in environmental documentation
Low Impact Development (Stormwater BMPs)	JPA/Project Management	✓	Water quality swales and basins included on segments A2, B2, and D3a and planned for future segments
Access to Agricultural Land	JPA/Project Management		Agricultural preservation a key component of the SSHCP
Context Sensitive Project Development	Project Delivery Process	✓	Wildlife crossings planned at two locations, existing drainage channels for hydromodification where feasible, special design approach for Segment C through the Sheldon community, developed through extensive public involvement
Tracking Environmental Commitments (environmental compliance tracking)	Project Delivery Process	✓	Completed with all segments constructed and required as part of the environmental documentation and SSHCP
Habitat Restoration (restore, preserve)	Inter‐Agency Agreements	✓	JPA is a plan partner and permittee of SSHCP, focused on habitat restoration and access to agricultural land
Access to Agricultural Land	Inter‐Agency Agreements		JPA is a plan partner and permittee of SSHCP, focused on habitat restoration and access to agricultural land
Regional Bicycle System Connectivity	Inter‐Agency Agreements		Multi-use path along Connector is integrated into member agency and SACOG's master bike plans, and ties into existing and planned trail networks
Energy Efficiency	Electrical	✓	LED lighting used on all traffic signals and streets lights for D3a, B2, and Scott Rd Realignment, and will be used on future segments.

Solution	Category	INVEST Criteria	Action Taken
Habitat Restoration Ecological Connectivity	Environment	✓	JPA is a plan partner and permittee of SSHCP, focused on habitat restoration and access to agricultural land. Two wildlife crossings are planned as part of the Connector project.
Reduce Diesel Particulate Matter Exposure	Environment		Connector expected to reduce regional congested VMT by 0.74 percent, resulting in a similar reduction in criteria pollutants regionally.
Trees for Air Pollution Impact Reduction	Environment		Connector Landscape plan includes planting of trees.
Site Vegetation Shade Canopy	Landscape	✓	Connector Landscape incorporates these items
Reduce and Reuse Materials	Materials/Resources	✓	RHMA used on several segments already constructed and will be used on future segments when feasible.
Earthwork Balance	Materials/Resources	✓	always try to balance site when feasible
Long‐Life Pavement Design	Pavement	✓	Pavement designed for 20-year design life or greater
Quiet Pavement	Pavement		RHMA used on several segments already constructed and will be used on future segments when feasible.
Pedestrian Access Bicycle Access	Roadway Design	✓	Multi-use path connects to other Class I and II facilities, as well as development adjacent to the corridor and transit facilities.

These sustainable practices and efforts combine to minimize the Connector's energy impact, encourage low- or zero-emission vehicle use, and reduce effects on natural resources.

MINIMIZING THE IMPACT TO LAND AND NATURAL RESOURCES

Sustainability in transportation includes integrating green infrastructure design elements and designing roadways to engage with their local environment instead of replacing it. Street design has important environmental impacts that can determine the viability of less-polluting modes of transportation and influence the volume of stormwater runoff, the water quality of that runoff, and the magnitude of the heat island effect.

The alignment and design features of the Connector include several green infrastructure design elements to integrate the project into its context and support environmental sustainability. Key elements of the Connector's sustainable strategy include:

- Stormwater management that utilizes oversized drainage structures along the natural terrain patterns to improve ecological connectivity, as well as vegetative bioswales or natural drainage systems for treatment of water runoff, where appropriate.
- Consideration of permeable pavement for roadway shoulders and multiuse paths to improve stormwater runoff water quality and minimize flooding.
- Noninvasive native, drought-tolerant plant species for landscaping to integrate the corridor with the surrounding habitat.
- In areas of sensitive habitat, the Connector alignment was selected to protect and preserve wildlife passage. The Connector project is currently developing a wildlife crossing at Alder Creek with a further crossing planned at Regina Creek, consistent with the recommendations in the SSHCP.
- Retaining walls to reduce right-of-way width requirements from excessive side slopes to minimize the impact on adjacent natural terrain.
- Habitat conservation through conservation easements and mitigations.

VI. Conclusion

As documented through this memorandum, the Connector project has been designed towards the goals of a Sustainable Highway, as defined by the FHWA. It maximizes "societal development and economic growth while reducing negative impacts to the environment and consumption of natural resources" (FHWA, INVEST). It considers the triple bottom line of social, environmental, and economic impacts, supporting the future transportation and land use network envisioned in planning efforts for the Sacramento region.

> The Connector JPA is committed to preserving vital biological habitat and using identified environmental mitigations to offset the loss of grassland, wetlands, and vernal pool habitat. To date, the Connector JPA has spent over $8 million on mitigation and secured 320 acres of conservation land and easement to maintain environmental habitats as well as farmland to support regional agricultural land uses in perpetuity.

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Appendix A. Project Development Criteria from FHWA's INVEST Program

PD-01 **Economic Analyses**
Using the principles of benefit-cost analysis (BCA) or economic impact analysis (EIA), provide evidence that the benefits, including environmental, economic, and social benefits, justify the full life-cycle costs.

PD-02 **Lifecycle Cost Analyses**
Reduce life-cycle costs and resource consumption through the informed use of life-cycle cost analyses of key project features during the decision-making process for the project.

PD-03 **Context Sensitive Project Development**
Deliver projects that harmonize transportation requirements and community values through effective decision-making and thoughtful design.

PD-04 **Highway and Traffic Safety**
Safeguard human health by incorporating science-based quantitative safety analysis processes within project development that will reduce serious injuries and fatalities within the project footprint.

PD-05 **Educational Outreach**
Increase public, agency, and stakeholder awareness of the integration of the principles of sustainability into roadway planning, design, and construction.

PD-06 **Tracking Environmental Commitments**
Ensure that environmental commitments made by the project are completed and documented in accordance with all applicable laws, regulations, and issued permits.

PD-07 **Habitat Restoration**
Avoid, minimize, rectify, reduce, and compensate the loss and alteration of natural (stream and terrestrial) habitat caused by project construction and/or restore, preserve, and protect natural habitat beyond regulatory requirements.

PD-08 **Stormwater Quality and Flow Control**
Improve stormwater quality from the impacts of the project and control flow to minimize their erosive effects on receiving water bodies and related water resources, using management methods and practices that reduce the impacts associated with development and redevelopment.

PD-09 **Ecological Connectivity**
Avoid, minimize, or enhance wildlife, amphibian, and aquatic species passage access, and mobility, and reduce vehicle-wildlife collisions and related accidents.

PD-10 **Pedestrian Facilities**
Provide safe, comfortable, convenient, and connected pedestrian facilities for people of all ages and abilities within the project footprint.

PD-11 **Bicycle Facilities**
Provide safe, comfortable, convenient, and connected bicycling facilities within the project footprint.

PD-12 **Transit and HOV Facilities**
Promote the use of public transit and carpools in communities by dedicating existing facilities to those uses, upgrading existing lanes, or providing new transit and high occupancy vehicle (HOV) facilities.

PD-13 **Freight Mobility**
Enhance mobility of freight movements, decrease fuel consumption and emissions impacts, and reduce freight-related noise.

PD-14 **ITS for System Operations**
Improve the efficiency of transportation systems through deployment of technology and without adding infrastructure capacity in order to reduce emissions and energy use, and improve economic and social needs.

PD-15 **Historic, Archaeological, and Cultural Preservation**
Preserve, protect, or enhance cultural and historic assets, and/or feature National Scenic Byways Program (NSBP) historic, archaeological, or cultural intrinsic qualities in a roadway.

PD-16 **Scenic, Natural, or Recreational Qualities**
Preserve, protect, and/or enhance routes designated with significant scenic, natural, and/or recreational qualities in order to enhance the public enjoyment of facilities.

PD-17 **Energy Efficiency**
Reduce energy consumption of lighting systems through the installation of efficient fixtures and the creation and use of renewable energy.

PD-18 **Site Vegetation, Maintenance and Irrigation**
Promote sustainable site vegetation within the project footprint by selecting plants and maintenance methods that benefit the ecosystem.

PD-19 **Reduce, Reuse and Repurpose Materials**
Reduce lifecycle impacts from extraction and production of virgin materials by recycling materials.

PD-20 **Recycle Materials**
Reduce lifecycle impacts from extraction, production, and transportation of virgin materials by recycling materials.

PD-21 **Earthwork Balance**
Reduce the need for transport of earthen materials by balancing cut and fill quantities.

PD-22 **Long-Life Pavement**
Minimize life-cycle costs by designing long-lasting pavement structures.

PD-23 **Reduced Energy and Emissions in Pavement Materials**
Reduce energy use in the production of pavement materials.

PD-24 **Permeable Pavement**
Improve flow control and quality of stormwater runoff through use of permeable pavement technologies.

PD-25 **Construction Environmental Training**
Provide construction personnel with the knowledge to identify environmental issues and best practice methods to minimize impacts to the human and natural environment.

PD-26 **Construction Equipment Emission Reduction**
Reduce air emissions from non-road construction equipment.

PD-27 **Construction Noise Mitigation**
Reduce annoyance or disturbance to surrounding neighborhoods and environments from road construction noise.

PD-28 **Construction Quality Control Plan**
Improve quality by requiring the contractor to have a formal Quality Control Plan (QCP).

PD-29 **Construction Waste Management**
Utilize a management plan for road construction waste materials to minimize the amount of construction-related waste destined for landfill.

PD-30 **Low Impact Development**
Use low impact development stormwater management methods that reduce the impacts associated with development and redevelopment and that mimic natural hydrology.

PD-31 **Infrastructure Resiliency Planning and Design**
Respond to vulnerabilities and risks associated with current and future hazards (including those associated with climate change) to ensure transportation system reliability and resiliency.

PD-32 **Light Pollution**
To safely illuminate roadways while minimizing unnecessary and potentially harmful illumination of the surrounding sky, communities, and habitat.

PD-33 **Noise Abatement**
Reduce traffic noise impacts to surrounding communities and environments.

ITEM 13

MEETING DATE: May 27, 2022

TITLE: Adopt Work Plan and Fiscal Year 2022-23 Budget and Member Agency Contribution

PREPARED BY: Derek Minnema and Susan Spalding

RECOMMENDATION

1. Approve Resolution 2022-11 adopting the Work Plan
2. Approve Resolution 2022-12 adopting the Fiscal Year ("FY") 2022-23 Budget
3. Approve Resolution 2022-13 adopting the FY 2022-23 Member Contribution

BACKGROUND

Section 6.d.4 of the Joint Powers Exercise of Powers Agreement requires that the Board adopt an annual budget no later than June 30th of each year. Additionally, Sacramento County, acting as the Treasurer/Auditor of the JPA, requires an adopted budget for processing transactions.

WORK PLAN

The Board affirmed the preference to construct all 34 miles of the Connector project as originally intended during the 2021 Board workshop. Discussion from the Board expressed the desire to continue momentum, lead project delivery through a shovel ready strategy, pursue funding scenarios that would deliver and construct all 34 miles, and align external regional planning documents so that they become consistent with the Connector's environmentally approved projects, member agency general plans, and the Program Environmental Impact Report.

Board discussion centered on the keys to success, including capitalizing on the momentum of the projects in construction, the need for exploring additional funding, and growing the coalition of supporters.

This Work Plan outlines specific goals and results the Board desires to be achieved during the year and will help monitor how the desired goals are being accomplished.

Our efforts can be summarized into a simple **'Mission Statement' – Secure Funding and Approvals for all 34-miles of the Connector Project**.

The JPA has numerous organizational/administrative responsibilities, though the following are the primary work elements of focus:

1. Secure funding for all 34 miles of the Connector project.

The Work Plan will direct staff to pursue funding options that would deliver and construct all 34 miles and ensure any new funds are expedited and exclusively programmed to the JPA for use on the entire alignment per the discretion of the JPA Board of Directors. Specifically:

- Continue to advocate for and pursue large Federal and State funding grants.
- Pursue regional funding through the Sacramento Area Council of Governments.
- Continue to work with Sacramento Transportation Authority ("STA") to encumber Measure A money from the current program into the Connector project budget and work with STA on future sales tax measures.

2. Ensure consistency and alignment amongst regional planning documents for all 34 miles of the Connector project.

The Work Plan will direct staff to advance remedies and strategies to align the Metropolitan Transportation Plan with currently approved project limits and show the 34-mile project in the construction phase to ensure its eligibility for construction monies.

3. Advance Environmental Approval, Engineering Design, and Construction.

The Work Plan will direct staff to advance CEQA-approved Connector projects to shovel-ready construction status on the quickest timeline practicable. Specifically:

- Segment A1/A2 – Kammerer Road: Support the City of Elk Grove's efforts to obtain NEPA clearance.
- Segment B2 - Grant Line Rd: Continue to fund and support construction efforts.
- Segment C – Grant Line Rd: Continue planning studies to delineate the Connector improvements and initiate the environmental analysis.
- Segment D2 – Grant Line Road: Initiate final engineering design and right of way.
- Segment D3 – White Rock and Scott Roads: Continue to fund and support construction efforts.

4. Ancillary efforts to the work elements include the following:

- Participate in the South Sacramento Habitat Conservation Plan Leadership Group;
- Maintain SSCHP compliance plan for projects under construction;
- Continue to purchase mitigation in Fiscal Year 2023-24;
- Continue public outreach, information sharing, media engagement; and
- Coordination and plan review of adjacent developments.

FY 2022-23 BUDGET

Staff has prepared a proposed budget for FY 2022-23 to reflect the Work Plan. The total budget is $6,141,013, which is a decrease of approximately $4.42M (42%) over the prior year, a reduction primarily reflected in the mitigation expense category.

Projected Year-End
FY 2021-22 Budget & Proposed FY 2022-23 Budget

	2022-23 Budget	Projected Year End	Diff	PROPOSED 2022-23 Budget
Funding Sources				
Member Contributions	$ 250,000	$ 250,000	$ -	$ 250,000
Other Local Funding	$ 500,000	$ 3,459,000	$ 2,959,000	$ 3,459,000
Measure A Funding - Capital	$ 5,479,642	$ 4,791,051	$ (688,591)	$ 1,570,000
Measure A Funding - Mitigation	$ 4,100,000	$ 4,147,987	$ 47,987	$ 852,013
State Funding	$ 220,000	$ -	$ (220,000)	$ -
Federal Funding	$ -	$ -	$ -	$ -
Interest Income	$ 10,000	$ 11,500	$ 1,500	$ 10,000
Total Funding Sources	**$ 10,559,642**	**$ 12,659,538**	**$ 2,099,896**	$ 6,141,013
Work In Progress Expenses				
Project Related Overhead				
Personnel - Salaries & Related	$ 716,788	$ 716,788	$ -	$ 748,420
Legal Services	$ 300,000	$ 220,000	$ (80,000)	$ 200,000
Lease, Insurance, Supplies, Etc.	$ 116,550	$ 101,721	$ (14,829)	$ 116,450
Audits & Accounting Services	$ 30,000	$ 28,000	$ (2,000)	$ 30,000
Miscellaneous	$ 51,750	$ 34,939	$ (16,811)	$ 48,438
Project Related Prof. Services	$ 1,432,591	$ 1,560,110	$ 127,520	$ 600,000
Land Acquisition & ROW	$ -	$ -	$ -	$ -
Mitigation	$ 4,100,000	$ 4,147,987	$ 47,987	$ 852,013
Construction	$ 3,720,795	$ 2,593,143	$ (1,127,652)	$ 3,459,000
County Allocated & Fiscal Services	$ 91,168	$ 91,168	$ -	$ 86,692
Total Work In Progress Expenses	**$ 10,559,642**	**$ 9,493,856**	**$ (1,065,784)**	$ 6,141,013

REVIEW OF PROJECTED YEAR-END FORECASTS

- Other Local Funding: The JPA received $3.459M in State Transportation Improvement Program ("STIP") funding for the Scott Road Realignment Project. Staff worked with the City of Elk Grove to "swap" the STIP funds to facilitate the project promptly. Although $500,000 was budgeted in FY 2021-22, no expenditures occurred, and the funds are budgeted for construction in FY 2022-23.

- Measure A Funding – Mitigation: STA approved a $5M mitigation contract through the Smart Growth Incentive Program. The FY 21-22 budget anticipated $4.1M in environmental mitigation expenditures or approximately 39% of the total budget.

- State Funding: Funding from the State Department of Resources Recycling and Recovery Rubberized Pavement Grant Program was allocated to construction on Segment D3a on a reimbursement basis, but the City of Folsom opted not to use the funds due to project cost savings, through the use of alternate paving material, exceeding the amount of the Grant award.

- The budget anticipated $3,720,795 in construction expenditures, approximately 35% of the FY 2021-22 budget, and 70% was expended. Forecasting construction expenditures is a challenge, and those expenditures carry over from year-to-year. The proposed budget anticipates $3,459,000 for construction.

FUNDING SOURCES

The funding sources anticipated in the proposed FY 2022-23 budget include a combination of local member agency contributions, other local funds and three STA Measure A allocations. The key elements include:

- Member Contributions – No increase in the contriburion amount from FY 2021-22. Contributions for FY 2022-23 are $50,000 for each member jurisdiction.
- Other Local Funding – These funds are budgeted for construction in FY 2022-23 for the Scott Road project.
- Measure A - Reimbursements will continue per the current capital and mitigation contracts between the STA and the JPA covering fiscal year 2022-23.

EXPENSES

Expenditures are categorized into one of the following six classifications:

- Project Related Overhead
  The costs associated with supporting all segments of the Connector and the overall mission. These include Personnel (salaries and benefits); Facility (rent, insurance, equipment, phones, copier, software, advertising, postage and office supplies); Legal Services; Audit & Accounting Services; and Miscellaneous (travel, training, memberships, mileage and workplace operations).

- Project Related Professional Services
  Professional Services contracted to deliver professional-level competency in their technical fields in direct support of all Connector segments. The proposed budget includes professional services costs associated with the following:
    - Construction support and monitoring
    - Miscellaneous engineering and surveying design tasks
    - Funding advocacy and grant writing

- Right of Way
  The cost of the acquisition and relocation (if necessary) of property required to build the project. No right-of-way acquisitions or relocations are associated with the proposed budget in FY 2022-23, but costs may arise within the next three years.

- Mitigation
  The cost of acquiring conservation easements, environmental impact assessments, purchase of mitigation credits required for the project, and compliance with SSHCP permitting requirements. The proposed budget includes mitigation costs associated with the following:
    - SSHCP Compliance
    - Analysis and acquisition of mitigation to support the entire alignment

- Construction
  The capital costs directly associated with the construction of the project. The proposed budget includes costs associated with the following:
    - Scott Road Realignment

- County Allocated and Fiscal Services
  The County of Sacramento allocates its indirect costs (overhead) to all departments within the County through the Allocated Cost Package. Allocated costs are mandatory and non-discretionary. Fiscal Services costs are based on the

department usage and are identified through Internal Orders.

SUMMARY

The FY 2022-23 budget is lower than previous years, reflecting the changing dynamic of projects that “ramp up” to construction and then become completed. The budget is presented in a single year; however, many of the construction and professional service expenditures carry over from year-to-year.

ATTACHMENTS

a. Resolution 2022-11
b. Resolution 2022-12
c. Resolution 2022-13

ITEM 13 a

RESOLUTION 2022-11

RESOLUTION OF THE BOARD OF DIRECTORS OF THE CAPITAL SOUTHEAST CONNECTOR JOINT POWERS AUTHORITY ADOPTING THE FISCAL YEAR 2022-23 WORK PLAN

BE IT RESOLVED by the Board of Directors ("Board") of the Capital SouthEast Connector Joint Powers Authority ("Connector JPA") that the proposed Fiscal Year 2022-23 Work Plan for the Connector JPA presented to the Board at this meeting is hereby adopted in substantially the same form as attached hereto.

This Resolution shall take effect from and after the date of its passage and adoption.

* * * * *

PASSED AND ADOPTED this 27th day of May, 2022, on a motion by Director _____, seconded by Director_____, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

_____
Chairperson

ATTEST:

_____
Secretary

ITEM 13 b

RESOLUTION 2022-12

RESOLUTION OF THE BOARD OF DIRECTORS OF THE CAPITAL SOUTHEAST CONNECTOR JOINT POWERS AUTHORITY ADOPTING THE FISCAL YEAR 2022-23 BUDGET

BE IT RESOLVED by the Board of Directors ("Board") of the Capital SouthEast Connector Joint Powers Authority ("Connector JPA") that the proposed Fiscal Year 2022-23 Budget for the Connector JPA presented to the Board at this meeting is hereby adopted in substantially the same form as attached hereto.

This Resolution shall take effect from and after the date of its passage and adoption.

* * * * *

PASSED AND ADOPTED this 27th day of May, 2022, on a motion by Director _____, seconded by Director_____, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

_____
Chairperson

ATTEST:

_____
Secretary

ITEM 13 c

RESOLUTION 2022-13

RESOLUTION OF THE BOARD OF DIRECTORS OF THE CAPITAL SOUTHEAST CONNECTOR JOINT POWERS AUTHORITY ADOPTING THE MEMBER JURISDICTION CONTRIBUTION FOR FISCAL YEAR 2022-23

BE IT RESOLVED by the Board of Directors ("Board") of the Capital SouthEast Connector Joint Powers Authority ("Connector JPA") that that each member jurisdiction shall contribute local funds in the amount of $50,000 for FY 2022-23.

This Resolution is intended to facilitate the expeditious transfer of funds from member jurisdictions to the Authority, pursuant to the Joint Exercise of Powers Agreement executed by each member jurisdiction.

This Resolution shall take effect from and after the date of its passage and adoption.

* * * * *

PASSED AND ADOPTED this 27th day of May, 2022, on a motion by

Director _____, seconded by Director_____, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

_____
Chairperson

ATTEST:

_____
Secretary

ITEM 14

MEETING DATE: May 27, 2022

TITLE: Review of Air Quality and Climate Adaptation Benefits of the Connector Project by Kittelson & Associates

PREPARED BY: Matt Lampa

RECOMMENDATION

Receive an update on climate adaptation and air quality benefits related to the Connector project.

BACKGROUND

Staff has been working with Kittelson & Associates, Inc. ("Kittelson") and Mark Thomas & Company, Inc. to prepare a climate adaptation and air quality benefits analyses to quantify how the Connector project addresses climate change and improves air quality.

The analysis includes an evaluation of greenhouse gas ("GHG") emissions, mobile source air toxins ("MSATs"), and climate adaptation strategies that will improve the region's ability to respond to unforeseen conditions in the future.

EXECUTIVE SUMMARY

The Connector provides a substantial improvement in mobility, access, and safety for the region, while also improving air quality and reducing GHGs. This is due to reductions in regional vehicle miles traveled ("VMT"), congestion, and expanded bicycle networks.

Furthermore, the Connector plays a role in helping the region adapt to climate change by making the County more resilient by providing an all-weather multimodal interregional corridor and key evacuation route. Additionally, the Connector preserves open space and threatened habitats.

AIR QUALITY

The air quality analysis focused on the effects of GHG emissions and MSATs. While GHG emissions occur both naturally and as a result of human activities, MSATs are toxic air contaminants emitted exclusively from mobile sources such as passenger cars and trucks. The CA Air Resources Board Emission Factor Modeling Program and the Caltrans On-Road

Mobile Emissions modeling programs assessed air quality, greenhouse gas emissions, and mobile source air toxins with and without the Connector project. The models indicate reductions in air quality emissions, GHGs, and MSATs to the region with the construction of the Connector:

Air quality and GHG emission from daily congested VMT reduction

	Air Quality Emissions (tons/day)						GHG Emissions (metric tons/day)
	ROG	NO_x	PM_{10}	$PM_{2.5}$	CO	SO_x	CO_2
No Connector	0.178	0.796	0.146	0.052	4.833	0.018	1,642
With Connector	0.177	0.790	0.145	0.051	4.797	0.018	1,630
Difference	-0.001	-0.006	-0.001	-0.0004	-0.036	-0.0001	-12
Percent Reduction	**-0.75%**	**-0.75%**	**-0.73%**	**-0.73%**	**-0.75%**	**-0.72%**	**-0.73%**

MSAT Emissions from Daily VMT on I-5, SR 50, and SR 99 (pounds/ day)

Road-way		1,3-Butadiene	Acetalde-hyde	Acrolein	Benzene	Diesel PM	Ethyl-benzene	Formalde-hyde	Naphtha-lene	POM
I-5	No Connector	0.256	0.775	0.055	1.837	2.837	1.540	1.924	0.148	0.0441
	With Connector	0.254	0.772	0.055	1.829	2.825	1.533	1.916	0.147	0.044
	Difference (With Connector – No Connector)	-0.001	-0.003	-0.001	-0.008	-0.012	-0.007	-0.008	-0.001	-0.001
	Percent Change	**-0.43%**	**-0.43%**	**-0.40%**	**-0.42%**	**-0.43%**	**-0.43%**	**-0.42%**	**-0.45%**	**-0.50%**
US 50	No Connector	0.679	1.109	0.151	4.664	2.595	4.003	3.249	0.372	0.101
	With Connector	0.674	1.101	0.149	4.629	2.576	3.973	3.224	0.369	0.091
	Difference (With Connector – No Connector)	-0.005	-0.008	-0.001	-0.035	-0.019	-0.029	-0.024	-0.003	-0.001
	Percent Change	**-0.75%**	**-0.74%**	**-0.88%**	**-0.75%**	**-0.75%**	**-0.75%**	**-0.75%**	**-0.77%**	**-0.66%**
SR 99	No Connector	0.529	1.266	0.115	3.728	4.124	3.158	3.319	0.299	0.085
	With Connector	0.528	1.262	0.115	3.717	4.111	3.148	3.309	0.298	0.084
	Difference (With Connector – No Connector)	-0.002	-0.004	-0.001	-0.011	-0.013	-0.009	-0.010	-0.001	-0.001
	Percent Change	**-0.29%**	**-0.30%**	**-0.38%**	**-0.31%**	**-0.30%**	**-0.31%**	**-0.31%**	**-0.30%**	**-0.26%**

The reduction in VMT and congestion results in improvements in air quality and reductions in GHG emissions regionally. Air quality benefits are primarily due to vehicles using the Connector as an alternative to a more congested route.

In addition, the Connector decreases VMT on existing highways that pass through disadvantaged communities, decreasing the MSAT burden that the communities in proximity to these freeways currently experience.

CLIMATE ADAPTATION

Climate adaptation challenges, such as wildfires and flooding, require a more resilient regional transportation network.

The Connector alignment's surrounding agricultural land is subject to fires that pose risks to the surrounding communities. More extreme weather increases fire risk with the northern portion of the Connector alignment in CalFire's high or very high fire risk zones.

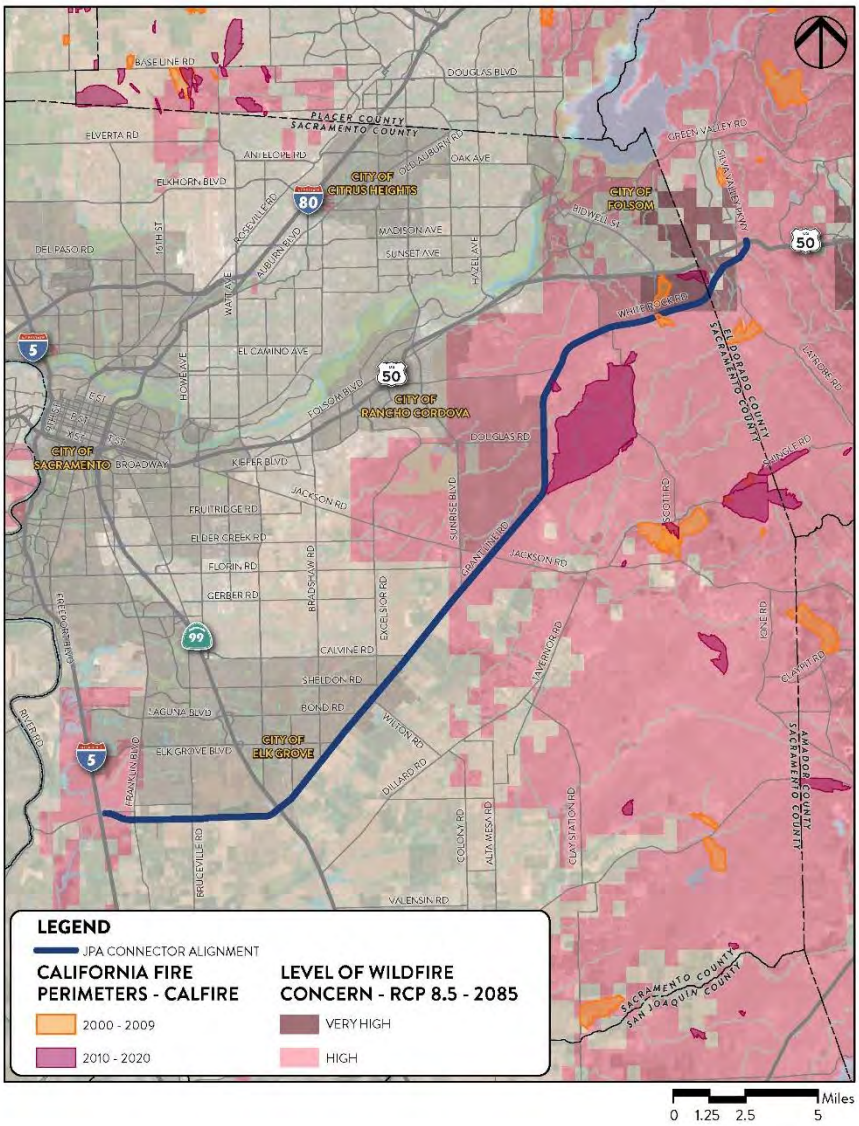


Figure 1 – Recent Wildfire Activity

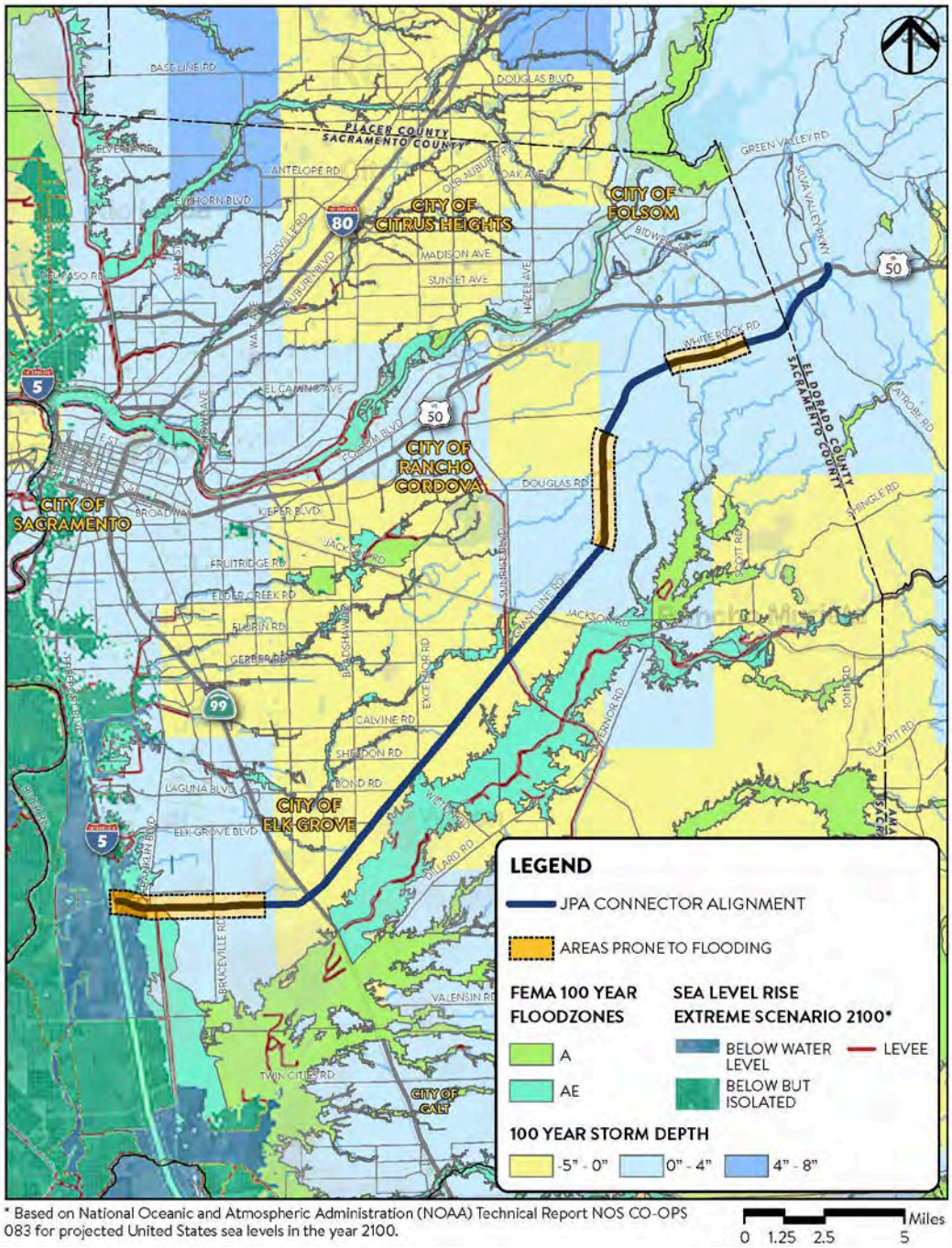


Figure 2 – Flood prone areas along the alignment.

Recent wildfires and flooding highlight the risk of climate events in the area. The Connector will provide an all-weather facility that expands resiliency in the region's infrastructure and mobility needs and provides resilient evacuation routes and access for emergency responders in the face of climate change and its impact.

CONNECTOR ALIGNS WITH CALIFORNIA GOALS

The California State Transportation Agency has published its California Transportation Plan 2050 ("CTP") and its Climate Action Plan for Transportation Infrastructure ("CAPTI"). The CTP is informed by multiple parallel state planning efforts focused on transportation modes, including the Interregional Transportation Strategic Plan ("ITSP").

The ITSP aligns with the CAPTI and its vision: "A safe, resilient, accessible, and sustainable multimodal interregional transportation network that equitably supports healthy, diverse communities, and strengthens California's vibrant economy." The ITSP continues its focus on investing in rural, smaller, or under-resourced communities throughout the state and will more clearly emphasize multimodal corridor planning and prioritize sustainable transportation solutions.

As a strategic interregional corridor connecting rural and non-urban communities, the Connector aligns with CAPTI and the CTP.

SUMMARY

Climatic events increasingly disrupt transportation for people and goods in the Sacramento Region and along the Connector alignment. The analysis reviewed state, regional, and local plans to understand climate adaptation challenges and strategies applicable to the Connector to create a more resilient regional transportation network.

In response to these and other climatic disruptions, the state and region have responded with various planning efforts to increase resiliency in the face of climate change and its impact. The Connector is aligned with these plans.

The project provides a wider fire break to reduce wildfire spread and will provide an all-weather evacuation route designed to withstand 100-year storm events.

ATTACHMENTS

a. Air Quality and Greenhouse Gas Benefits Key Takeaway
b. Climate Adaptation & Resiliency Key takeaway
c. Air Quality and Greenhouse Gas Benefits Memorandum, dated May 2022
d. Climate Adaptation & Resiliency Benefits Memorandum, dated May 2022

ITEM 14 a

I. KEY TAKEAWAYS

AIR QUALITY/GREENHOUSE GASES

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

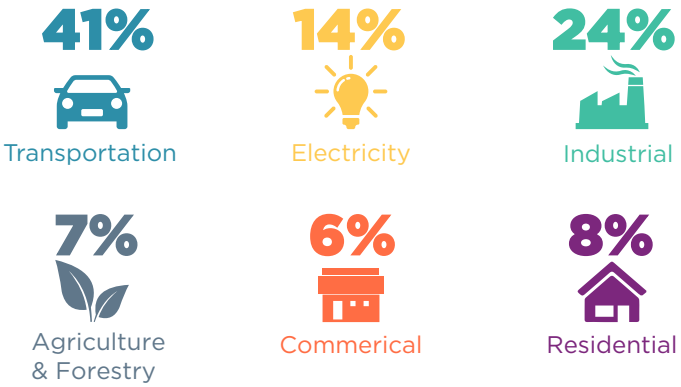
WHY EVALUATE AIR QUALITY AND GREENHOUSE GAS EMISSIONS?

- Poor air quality leads to health issues, especially in children and elderly
- Communities along nearby state routes are impacted by environmental disparities
- Greenhouse gas emissions have been linked to climate change, which may contribute to sea level rise, more extreme weather, wildfires, and drought

HOW DOES TRANSPORTATION IMPACT AIR QUALITY AND GREENHOUSE GAS EMISSIONS?

- Air quality deteriorates as pollutants are emitted from vehicle tailpipes.
- Vehicle miles traveled are an indicator of air quality and greenhouse gas emissions.

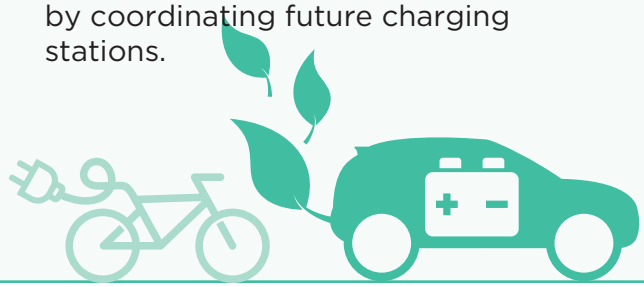
2019 CALIFORNIA GREENHOUSE GAS EMISSIONS BY SECTOR



Source: California Air Resources Board

WHAT BENEFITS DOES THE CONNECTOR PROJECT PROVIDE?

- Reduces regional vehicle miles traveled and congestion, therefore improving air quality and reducing greenhouse gas emissions.
  - **0.73%-0.75%** reduction in regional primary criteria pollutants.
  - **0.73%** reduction in regional carbon dioxide (CO_2), or 12 metric tons.
- Expands the bicycle network with a separated multi-use path, supporting additional reductions in vehicle travel and related emissions and pollutants.
- Supports and advances electric vehicles by coordinating future charging stations.



CLIMATE ADAPTATION & RESILIENCY ANALYSIS

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

The Connector is an opportunity to address multiple local, regional, and state initiatives, goals, and plans to improve local and regional resiliency against climate change and its impacts. It also reduces the factors that contribute to these outcomes. The Connector will transform an older road with substandard features into a safe, efficient multimodal corridor that will prepare the region's ability to respond to unforseen conditions in the decades to come. The improved corridor will allow people and goods to circulate more easily, enhancing the region's ability to respond to emergencies.

IMPACTS FROM CLIMATE CHANGE ON THE REGION INCLUDE FREQUENT FLOODING AND WILDFIRES

The Connector provides climate resiliency benefits including:

IMPROVED MOBILITY AND REDUCED VEHICLE MILES TRAVELED

The Connector provides multimodal facilities, reduces congestion, and improves traffic operations, which reduces greenhouse gases that contribute to climate change. In addition, the Connector decreases travel times and increases route options for emergency responders and local residents during emergency events.

ADDED REDUNDANCY IN THE ENERGY NETWORK

The Connector project hardens existing electric infrastructure and provides redundancy for the electrical power grid, helping maintain service if there is damage to other regional facilities.

AN ALL-WEATHER CORRIDOR

The Connector's stormwater management facilities will accommodate 100-year storm events and reduce corridor flooding impacts.

REDUCED WILDFIRE RISK

A wider roadway serves as a fire break and provides access for emergency responders. The project moves utility poles farther away from the roadway, reducing the risk of downed power lines and fire risks.

SMART CORRIDOR ELEMENTS

Changeable message signs along the Connector provide a way to share key notifications in an emergency. Other Smart Corridor Planning strategies support reliability, safety, and emergency technologies.

A ROBUST EVACUATION ROUTE

The Connector will serve as the primary emergency evacuation route for south Sacramento County.

ITEM 14 c

4825 J Street, Suite 200
Sacramento, CA 95819
P 916.706.1374

MEMORANDUM: Air Quality and Greenhouse Gas Benefits

May 20, 2022 Project #: 27098

To: Matt Lampa, PE, Principal Civil Engineer
Capital SouthEast Connector JPA
10640 Mather Blvd., Suite 120
Mather, CA 95655

CC: Derek Minnema, PE, Executive Director

From: Heather Dubois; Kari Zajac, MESM; Jesse Voremberg; Rincon Consultants, Inc.
Matt Braughton, RSP; Kelly Lausten; Mike Aronson, PE; and Allison Woodworth
Kittelson & Associates, Inc.

RE: Connector Project Performance Benefits Study – Air Quality and Greenhouse Gases Analysis

Executive Summary

This memorandum provides an overview of vehicle miles traveled (VMT) and the relationship of VMT to pollutants and toxic contaminants that impact air quality. It subsequently quantifies expected VMT reduction and no associated air quality and greenhouse gas increase from implementation of the Capital SouthEast Connector (Connector) project. The results reflect that the project benefits include reduced congestion systemwide, reduced VMT systemwide, and reduced VMT on existing highways. Additional expected project benefits include air quality and greenhouse gas benefits resulting from improved and expanded bicycle lanes and the inclusion of electric vehicle infrastructure. The Connector project provides a substantial improvement in mobility, access, and safety for the region, while also providing the following air quality and greenhouse gas benefits:

- Reduces regional VMT by 0.01% and congested VMT by 0.75%, and therefore improves air quality and reduces greenhouse gas emissions regionally by 0.73%.
- Reduces Mobile Source Air Toxins (MSATs) averages on I-5 by 0.43%, Route 50 by 0.75%, and SR 99 by 0.31%., thereby reducing pollution burden on disadvantaged communities along these freeways.
- Expands the bicycle network with a separated multi-use path, supporting additional potential reductions in vehicle travel and related emissions and pollutants.
- Supports and advances electric vehicles by coordinating future charging stations. Electric vehicles do not emit criteria pollutants or toxic air contaminants.

The analysis in this memorandum demonstrates the Connector will improve air quality and reduce greenhouse gas emissions, and therefore the project will not impede the region from meeting greenhouse gas reduction goals.

This memorandum consists of the following sections:

The following page summarizes the key takeaways from the air quality and greenhouse gas analysis.

I. KEY TAKEAWAYS

AIR QUALITY/GREENHOUSE GASES

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

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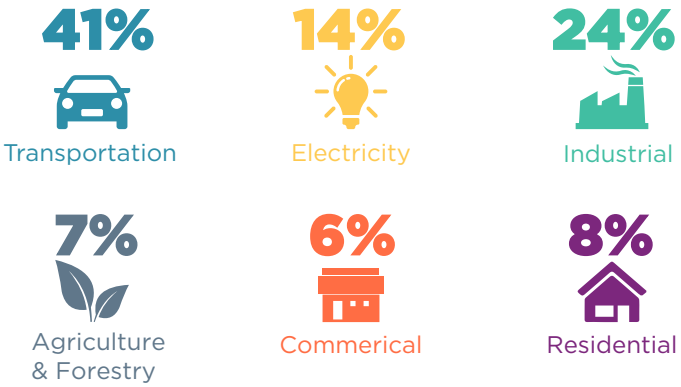

Source: California Air Resources Board

WHAT BENEFITS DOES THE CONNECTOR PROJECT PROVIDE?

- Reduces regional vehicle miles traveled and congestion, therefore improving air quality and reducing greenhouse gas emissions.
  - **0.73%-0.75%** reduction in regional primary criteria pollutants.
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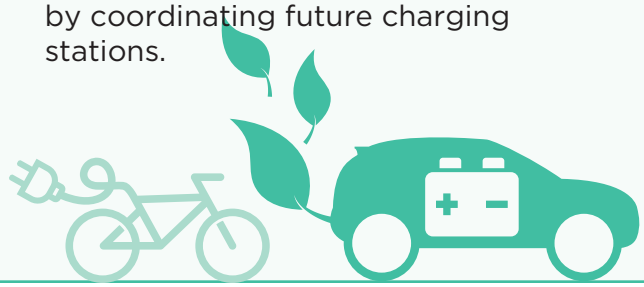
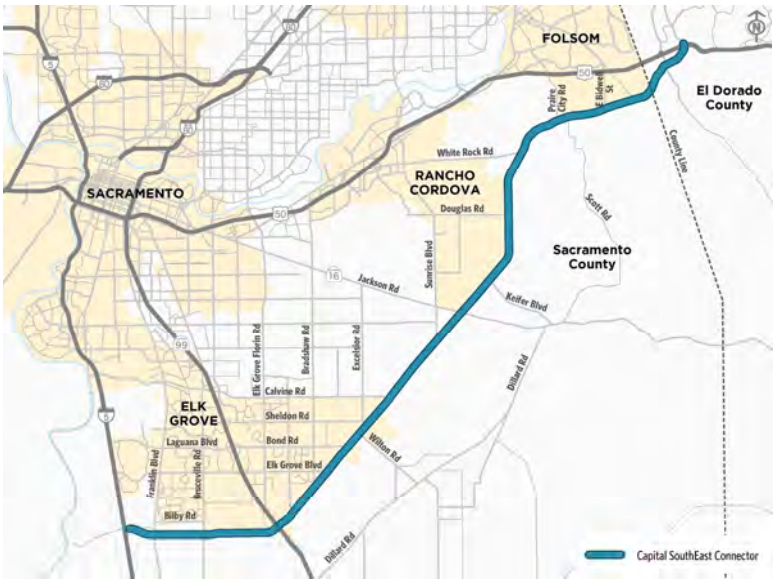


II. Project Background

As shown in Figure 1, the Connector is a 34-mile roadway connection southeast of the City of Sacramento that extends from Interstate 5 (I-5) in Elk Grove to US Highway 50 (US 50) in El Dorado County. While the Connector includes some new sections of roadway, most of its alignment is existing roadways which will be upgraded as part of the overall project.

Figure 1. Connector Alignment



The ultimate Connector design includes four to six travel lanes, a separated multiuse path, landscape median, and limited access points. Existing roadways that make up the connector include Kammerer Road, Grant Line Road, and White Rock Road. While the Connector has distinct segments identified for construction phasing, the Connector project as a whole is considered when evaluating air quality and greenhouse gas emissions.

The Connector is envisioned to be the primary regional transportation route that serves broader transportation and land use planning and conservation efforts in southeast Sacramento County. The Connector provides a multimodal facility connecting Elk Grove to the south and Folsom and El Dorado Hills to the north. The area between these urbanized and growth areas has been subject to several conservation and preservation efforts, including the Sacramento Area Council of Governments (SACOG) 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS)[1] and the South Sacramento Habitat Conservation Plan (SSHCP)[2]. The Capital SouthEast Connector Joint Powers Authority (Connector JPA) is an SSHCP plan partner and was instrumental in the development and funding of the SSHCP.

The Connector provides a much-needed transportation link, enhancing regional connectivity while minimizing impacts, preserving open space, and protecting threatened habitats.

III. How Are Air Quality and Greenhouse Gas Emissions Measured?

Air quality and greenhouse gas emissions are measured in a variety of ways, including primary and secondary criteria pollutants, air toxic contaminants, and emissions tied to the greenhouse effect and climate change. Each of these are described below.

[1] The SACOG 2020 MTP/SCS is a 20-year multimodal transportation plan and land use strategy. As described in the plan, "the 2020 MTP/SCS lays out a transportation investment and land use strategy to support a prosperous region, with access to jobs and economic opportunity, transportation options, and affordable housing that works for all residents. The plan also lays out a path for improving our air quality, preserving open space and natural resources, and helping California achieve its goal to reduce greenhouse gas emissions that contribute to climate change."

[2] The SSHCP is a regional effort that provides development and infrastructure projects with streamlined, predictable county and State permitting processes while creating a Preserve System to protect habitat, species, aquatic resources, open space, and agricultural lands in South Sacramento. The plan area includes a total of 317,656 acres.

AIR QUALITY AND CRITERIA POLLUTANTS

Air quality is largely impacted by increased concentrations of primary criteria pollutants. Primary criteria pollutants are emitted directly from a source, such as a vehicle tailpipe. California and the United States Environmental Protection Agency (USEPA) have established limits for criteria pollutants called the National Ambient Air Quality Standards (NAAQS).[3] California also has also adopted the California Ambient Air Quality Standards (CAAQS). Appendix A provides detailed information on the pollutants, NAAQS, CAAQS, and attainment status of the Sacramento Metropolitan Air Quality Management District (SMAQMD). The appendix also includes technical information on how emissions and pollutants are measured. Primary pollutants interact with the atmosphere to create secondary pollutants that also impact air quality.

Primary criteria pollutants include:

- Carbon Monoxide (CO)
- Volatile Organic Compounds (VOC)/Reactive Organic Gases (ROG)
- Nitrogen Oxides (NO_x)
- Particulate Matter (PM), grouped as particles with diameters up to 2.5 microns or 10 microns ($PM_{2.5}$, PM_{10})
- Sulfur Dioxide (SO_x)
- Lead

Secondary pollutants include:

- Smog (sulfate and nitrate particulates)
- Oxidants
- Ozone

Poor air quality from a proliferation of these criteria pollutants leads to health issues. When levels of criteria pollutants exceed the NAAQS or CAAQS, members of the public most susceptible to respiratory distress, such as children under 14, elderly over 65, people who work outdoors, or those with cardiovascular or chronic respiratory diseases, are at risk (California Air Resources Board [CARB] 2022). In particular, for the SMAQMD the following criteria pollutants are currently nonattainment per state or national standards: Ozone, PM_{10}, and $PM_{2.5}$. Additional details can be found in Appendix A.

MOBILE SOURCES OF AIR TOXICS

Toxic air contaminants (TACs) are a diverse group of air pollutants that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. Mobile source air toxics (MSAT) are a sub-set of TACs and are emitted exclusively from mobile sources, such as passenger cars and trucks.

The USEPA identified the following nine air toxic compounds as considerable contributors from mobile sources:

- 1,3-butadiene
- Acetaldehyde
- Acrolein
- Benzene
- Diesel Particulate Matter (DPM)
- Ethylbenzene
- Formaldehyde
- Naphthalene
- Polycyclic Organic Matter

Freeways, high volume roadways, and railways are major sources of MSATs with DPM being one of the main sources of TAC in California, and the Sacramento area. Living in proximity to these roadways, especially

[3] Sections 108 and 109 of the Clean Air Act governs the establishment of the NAAQS to provide protection for the nation's health and environment. The process for establishing and reviewing NAAQS can be found here: https://www.epa.gov/criteria-air-pollutants/process-reviewing-national-ambient-air-quality-standards.

downwind, high traffic volumes may lead to adverse health effects, such as respiratory diseases and cancer, due to exposure to TACs like DPM. DPM is extremely small (90 percent of DPM is one micron in diameter which is about 1/70th the diameter of a human hair) and can be deposited into the lungs. DPM exposure contributes to numerous health impacts including allergies, asthma, respiratory illness, lung cancer, increased hospital admissions (particularly for heart disease) and even premature death (CARB 2022). CARB estimated that exposure to DPM contributes to approximately 1,400 annual premature deaths from cardiovascular disease in California (CARB 2022). DPM exposure is also "believed to be responsible for about 70% of California's estimated known cancer risk attributable to toxic air contaminants" (CARB 2022). Children are also the most susceptible and vulnerable to TACs and MSATs because their lungs are not fully developed. Therefore, CARB generally recommends that land use developments that include sensitive receptors (e.g., children, pregnant women, the elderly, and persons with serious health problems) not be sited within 500 feet of freeways or urban roadway with traffic volumes of 100,000 vehicles per day or greater.

GREENHOUSE GAS EMISSIONS & CLIMATE CHANGE

Greenhouse gas (GHG) emissions occur both naturally and as a result of human activities, such as fossil fuel burning, decomposition of landfill wastes, raising livestock, deforestation, and some agricultural practices. The main GHGs produced by human activities include:

- Carbon dioxide (CO_2)
- Methane
- Nitrous oxide
- Hydrofluorocarbons (HFCS)
- Perfluorocarbons (PFCS)
- Sulfur hexafluoride (SF_6)

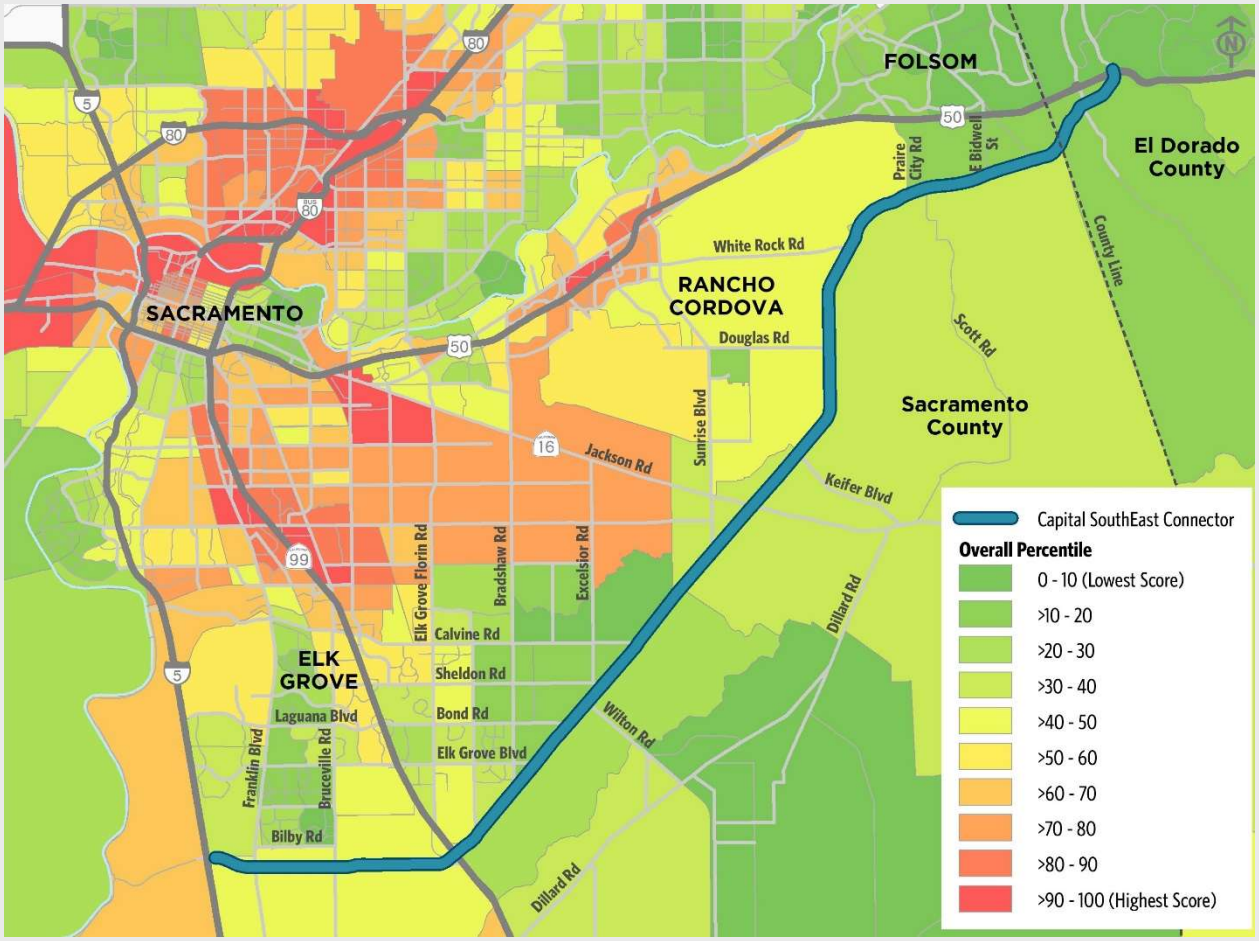
Carbon dioxide, methane and nitrous oxide are the primary GHG emissions from fossil fuel combustion, but also have natural sources that contribute to their atmospheric concentrations. Unlike many other greenhouse gases, fluorinated gases (HFCS, PFCS, SF_6) have no natural sources and only come from human-related activities, most often from refrigerants and industrial processes.

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. This phenomenon is the result of numerous, cumulative sources of GHG emissions contributing to the "greenhouse effect," a natural occurrence which takes place in Earth's atmosphere and helps regulate the temperature of the planet. Most of the radiation from the sun hits Earth's surface and warms it. The surface, in turn, radiates heat back towards the atmosphere in the form of infrared radiation. Gases and clouds in the atmosphere trap and prevent some of this heat from escaping into space and re-radiate it in all directions. Adverse effects of climate change in California may include reduced water supply from snowpack, sea level rise, more extreme heat days per year, more large forest fires, and more drought years (United Nations Intergovernmental Panel on Climate Change 2021).

Air Pollution and Disadvantaged Communities

Disadvantaged communities within California have been typically defined as areas that score within the top 25 percent of the CalEnviroScreen, a mapping tool by CalEPA that identifies communities that are disproportionately burdened by a combination of economic, health, and environmental burdens. A score is produced for areas using socioeconomic, health, and environmental information. Figure 2 shows the CalEnviroScreen scores in the Sacramento, Elk Grove, and Rancho Cordova regions along with the scores of areas near the Connector.

Figure 2: CalEnviroScreen Scores in the Connector Region



Along Interstate 5 (I-5), United State Route 50 (Route 50), and State Route 99 (SR 99), there are several areas that are in the 50 and above overall percentile, which is a score that accounts for the pollution burden and population characteristics of the general area. Adjacent to Route 50 and SR 99, several areas are in the 90-100 percentile with the highest exposure source vehicle traffic. Additionally, the specific parcels south of downtown Sacramento surrounding SR 99 are part of the CARB Assembly Bill 617 Community Air Protection Program due to the high cumulative air pollution exposure burden experienced in the communities from sources like traffic traveling on SR 99. The community has high rates of asthma and low birth weight infants because of the exposure to environmental hazards. As discussed later in this memo, the Connector project reduces traffic on I-5, Route 50, and SR 99. There are not disadvantaged communities along the alignment of the Connector.

IV. How Does Transportation Impact Air Quality and Greenhouse Gas Emissions?

VEHICLE MILES TRAVELED

VMT is a calculation of the number of miles that vehicles travel in a geographic region or on a roadway. VMT analysis shows whether a particular development would generate low enough VMT to aid the State in meeting its climate targets[4] relative to projected growth in population and employment by comparing projected VMT to existing regional VMT. Daily VMT is a calculation of the number of miles that vehicles travel on average per day. Calculating VMT paints a picture of air quality and greenhouse gases that would be generated by a project, since vehicle travel is a significant source of both criteria air pollutants and greenhouse gas emissions. Congested VMT (i.e., VMT generated in heavy traffic) can be isolated to paint a picture of how many miles drivers spend in roadway congestion. VMT is observed to decrease as trip length decreases. Providing pedestrian and bicycle networks that connect residents and employees to services would replace some personal vehicle trips with active transportation. A few examples of projects that may increase VMT include:

- Adding a new lane to a highway.
- Dispersed development accessible only by personal vehicles.
- Removal of an active or public transportation option.

A few examples of projects that may decrease VMT include:

- Class I multi-use path near jobs, services, and residential developments.
- Infill development near jobs, services, and transit.
- Increased access to transit.

Connector Project VMT

As documented in a September 2021 memorandum, *Travel Demand Model (TDM) Update Summary,* Kimley Horn developed a refined TDM for the Connector project to assess anticipated changes in regional activity with the Connector, which was peer reviewed by Kittelson. The Connector TDM is based on the Sacramento Area Council of Governments (SACOG) SACSIM travel demand model. The TDM was refined to include a more detailed roadway network and updated land use data consistent with existing conditions and approved development plans. Table 2 illustrates the expected change in VMT, daily congested VMT, and daily vehicle hours traveled (VHT) with the Connector project, based on the SACOG region.

Table 2: Capital SouthEast Connector Changes in SACOG Region VMT and VHT

Scenario	Daily VMT	Daily Congested VMT	Daily VHT
No Connector	74,561,768	5,405,558	2,236,293
With Connector	74,555,224	5,365,589	2,232,994
Difference (With Connector minus No Connector)	(6,544)	(39,970)	(3,300)
Percent Change	**-0.01%**	**-0.74%**	**-0.15%**

[4] Under Senate Bill 32, California aims to reduce greenhouse gas emissions by 40 percent below 1990 levels by 2030.

Source: Travel Demand Model (TDM) Update Summary, September 2021 (Kimley Horn)

As shown, the Connector is expected to result in the following changes:

- Reduction in regional daily VMT by 0.01 percent.
- Reduction in regional congested daily VMT by 0.74 percent.
- Reduction in vehicle hours traveled (VHT) by 0.15 percent

Based on the regional reductions in daily VMT, congested VMT and daily VHT, there would be a direct reduction of emissions and improvement in air quality due to the reduction in travel and travel times from implementation of the Connector. The specific air quality and GHG benefits with the Connector are discussed in the next section.

METHODOLOGY FOR CALCULATING AIR QUALITY AND GHG EMISSIONS

Criteria air pollutant and CO_2 emissions were computed using the daily VMT and daily congested VMT and modeling them in the CARB emission factor modeling program, EMFAC2021. EMFAC2021 is the latest version of the California emissions inventories model and was released by CARB on January 15, 2021 (CARB 2021). EMFAC2021 calculates emissions from on-road motor vehicles including cars, trucks, and buses in California. Unlike its predecessors, the EMFAC2021 model accounts for plug-in hybrid electric vehicles, natural gas-powered vehicles, energy consumption from light- and heavy-duty zero emission vehicles, light-duty zero emission vehicles, and includes an updated forecasting approach. The vehicle fleets included in EMFAC2021 have updated vehicle population data from the Department of Motor Vehicles. Pursuant to the latest rulings from the USEPA, EMFAC2021 accounts for the USEPA Safer Affordable Fuel-Efficient (SAFE) or SAFE Vehicles Rule Part One: One National Program and the Final SAFE Rule emission factors[5].

To compute the on-road emission inventories from the daily and daily congested VMT anticipated for the Connector, the Scenario Analysis feature was used from EMFAC2021. This option approximates criteria pollutant emissions, GHG emissions, and fuel usage using vehicle activity data provided. The EMFAC2021 v1.0.1 was used for the Connector and the SACOG region was analyzed annually during the 2040 calendar year when the Connector would be fully built out and operational. Additional information on the quantification of emissions is contained in *Appendix A: Technical Overview for the Air Quality and Greenhouse Gas Memorandum*.

METHODOLOGY FOR MSAT EMISSIONS

MSATs for the No Connector and With Connector scenarios were computed using the daily VMT on I-5, Route 50, and SR 99 (shown in Table 6) modeled in the California Department of Transportation (Caltrans) on-road mobile emissions modeling program, CT-EMFAC2017. EMFAC2021 was not used because it is not capable of modeling MSAT emissions. The Caltrans CT-EMFAC2017 model was published in January 2019 and uses emission factors derived from the CARB EMFAC2017 to calculate criteria pollutant and GHG emissions. For the MSAT emissions, CARB-supplied/USEPA-supplied MSAT speciation factors are used. The model considers emissions generated from running exhaust, running loss, tire wear, brake wear, and road dust. The quantity of on-road mobile pollutants emitted are based on the following travel activity parameters: traffic volume, traffic speed, and fleet mix (percentage of passenger vehicles verses trucks).

To compute the on-road MSATs generated from traffic on the highways, emission factors were determined by using Sacramento as the area of analysis; 2040 as the first year of operation; and an annual season. For the vehicle fleet mix category, the percentage of trucks on I-5, Route 50, and SR 99 were derived using the Caltrans

[5] SAFE Rule is the updated and amended version of the existing Corporate Average Fuel Economy standards. The SAFE Rule applies to tailpipe CO_2 emissions for passenger cars and light trucks for models between 2021 and 2026.

2020 Truck Traffic: Annual Average Daily Truck Traffic data. The data provides the percentage of trucks traveling on segments of the highways. The total truck percentages for each segment of the respective freeways were summed then averaged to get an average representative. The CARB road surface silt loading factor for a freeway and the CARB precipitation correction were used. Emissions MSATS were generated along with fuel consumption, criteria pollutants, and GHGs.

V. Connector Project Benefits

The Connector project will lower traffic congestion and VMT, improving air quality and reducing greenhouse gas emissions. These benefits were calculated quantitatively based on the following:

- Reduced traffic congestion systemwide
- Reduced vehicle miles traveled systemwide
- Reduced vehicle miles traveled on existing highways

The Connector is also expected to provide additional air quality and greenhouse gas benefits that are not directly modeled by improving the bicycle network and electric vehicle infrastructure, which are discussed qualitatively.

REDUCED TRAFFIC CONGESTION SYSTEM-WIDE

Reducing traffic congestion improves air quality and reduces GHG emissions. Idling in heavy traffic, which results from congested roadways, emits criteria pollutants that can be avoided with free-flowing traffic (Sharma et al 2018). Therefore, idling represents an avoidable source of air pollution and associated air quality deterioration (Shancita et al 2014). Idling is more prevalent on arterials, a common roadway choice in the absence of a freeway, where it accounts for about 18 percent of all intersection emissions (Papson et al 2012). Residential developments and commercial uses are often located along arterials, which exposes sensitive members of the public to respiratory distress.

The Connector would alleviate congestion and redirect existing traffic from local arterials to the new connector roadway. As shown in Table 3, the 0.74 percent reduction in congested VMT with the Connector has a reciprocal impact on criteria pollutant and GHG emissions.

Table 3: Air Quality and GHG Emissions from Daily Congested VMT Reduction

	Air Quality Emissions (tons/day)						GHG Emissions (metric tons/day)
	ROG	NO_x	PM_{10}	$PM_{2.5}$	CO	SO_x	CO_2
No Connector	0.178	0.796	0.146	0.052	4.833	0.018	1,642
With Connector	0.177	0.790	0.145	0.051	4.797	0.018	1,630
Difference	-0.001	-0.006	-0.001	-0.0004	-0.036	-0.0001	-12
Percent Reduction	**-0.75%**	**-0.75%**	**-0.73%**	**-0.73%**	**-0.75%**	**-0.72%**	**-0.73%**

Source: See Appendix B. Emissions were estimated using EMFAC2021 v1.0.1

REDUCED VEHICLE MILES TRAVELED SYSTEM-WIDE

The air quality and GHG emissions that would be generated from regional daily VMT in the region without the Connector compared to with the Connector project are provided in Table 4. The Connector would have a negligible/neutral impact on air quality and GHG emissions from an overall regional daily VMT standpoint. The percent change, like the daily VMT change, is less than a 0.01 percent different.

Table 4: Air Quality and GHG Emissions from Daily VMT Reduction

	Air Quality Emissions (tons/day)						GHG Emissions (metric tons/day)
	ROG	NO_x	PM_{10}	$PM_{2.5}$	CO	SO_x	CO_2
No Connector	2.4774	11.5069	2.0505	0.7326	66.4101	0.2539	22,943
With Connector	2.4772	11.5061	2.0503	0.7326	66.4044	0.2538	22,941
Difference (With Connector – No Connector)	-0.0002	-0.0008	-0.0002	-0.0001	-0.0058	-0.00002	-2
Percent Change	**-0.008%**	**-0.007%**	**-0.008%**	**-0.008%**	**-0.009%**	**-0.008%**	**-0.008%**

Source: See Appendix B. Emissions were estimated using EMFAC2021 v1.0.1

REDUCED VEHICLE MILES TRAVELED ON EXISTING HIGHWAYS

Table 5 shows the existing VMT and projected VMT with the Connector on I-5, US Route 50, and SR 99. The Connector would result in a cumulative reduction of VMT of 0.53 percent.

Table 5: VMT on I-5, US Route 50, and SR 99

Area	Daily VMT		
	I-5	US Route 50	SR 99
No Connector	1,225,654	3,090,005	2,479,541
With Connector	1,220,422	3,066,893	2,471,970
Difference (With Connector – No Connector)	-5,232	-23,113	-7,571
Percent Change	**-0.43%**	**-0.75%**	**-0.31%**

Source: See Appendix B. VMT was estimated using EMFAC2021 v1.0.1

Table 6 lists the MSAT emissions on the freeways with and without the Connector in pounds per day. Reductions from 0.26 percent to 0.88 percent are expected for all MSAT Emissions with the Connector project on the three state routes most directly impacted by the implementation of the Connector project.

Table 6: MSAT Emissions from Daily VMT on I-5, Route 50, and SR 99 (pounds/day)

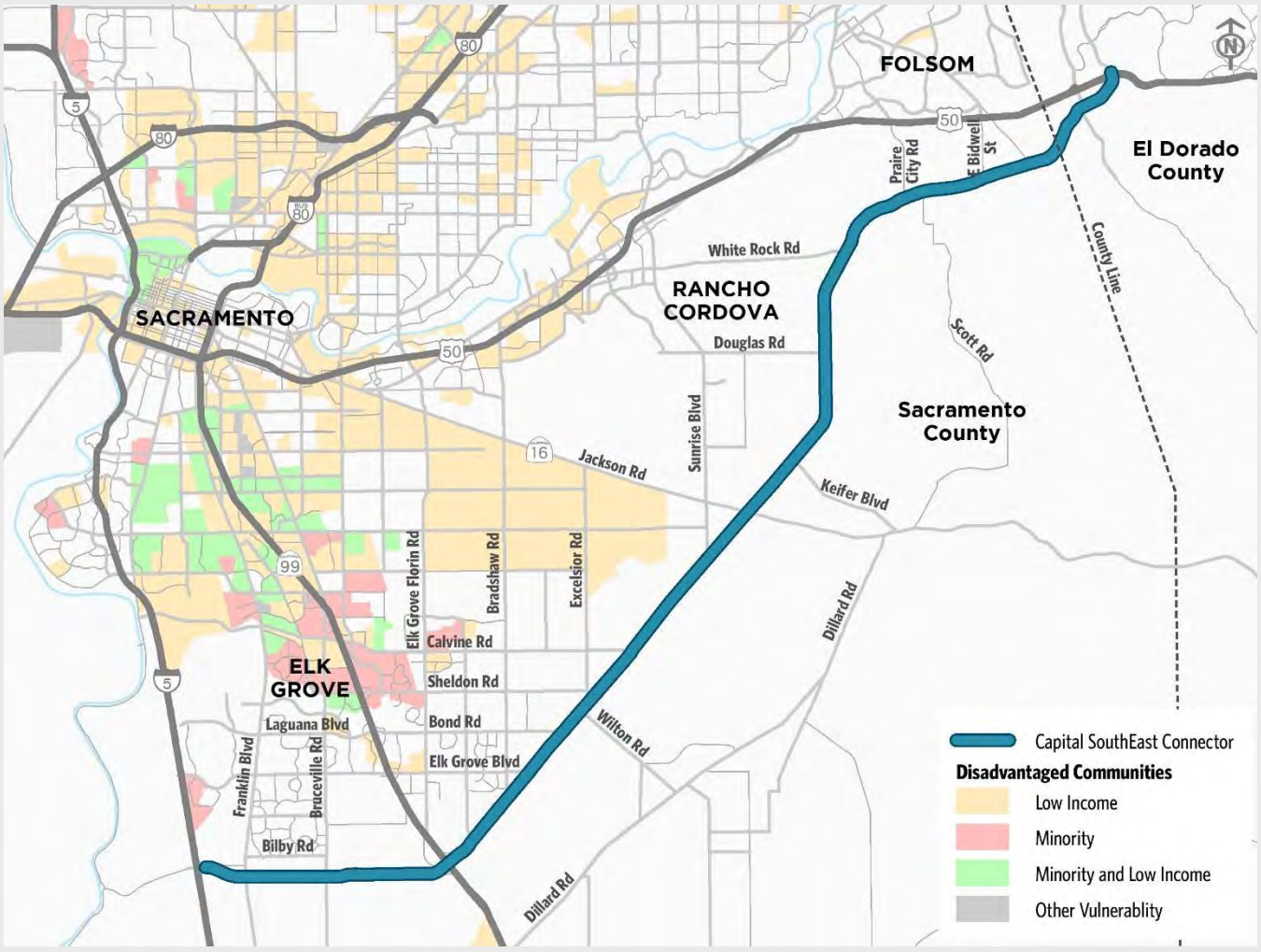
Road-way		1,3-Butadiene	Acetalde-hyde	Acrolein	Benzene	Diesel PM	Ethyl-benzene	Formalde-hyde	Naphtha-lene	POM
I-5	No Connector	0.256	0.775	0.055	1.837	2.837	1.540	1.924	0.148	0.0441
	With Connector	0.254	0.772	0.055	1.829	2.825	1.533	1.916	0.147	0.044
	Difference (With Connector – No Connector)	-0.001	-0.003	-0.001	-0.008	-0.012	-0.007	-0.008	-0.001	-0.001
	Percent Change	**-0.43%**	**-0.43%**	**-0.40%**	**-0.42%**	**-0.43%**	**-0.43%**	**-0.42%**	**-0.45%**	**-0.50%**
US 50	No Connector	0.679	1.109	0.151	4.664	2.595	4.003	3.249	0.372	0.101
	With Connector	0.674	1.101	0.149	4.629	2.576	3.973	3.224	0.369	0.091
	Difference (With Connector – No Connector)	-0.005	-0.008	-0.001	-0.035	-0.019	-0.029	-0.024	-0.003	-0.001
	Percent Change	**-0.75%**	**-0.74%**	**-0.88%**	**-0.75%**	**-0.75%**	**-0.75%**	**-0.75%**	**-0.77%**	**-0.66%**
SR 99	No Connector	0.529	1.266	0.115	3.728	4.124	3.158	3.319	0.299	0.085
	With Connector	0.528	1.262	0.115	3.717	4.111	3.148	3.309	0.298	0.084
	Difference (With Connector – No Connector)	-0.002	-0.004	-0.001	-0.011	-0.013	-0.009	-0.010	-0.001	-0.001
	Percent Change	**-0.29%**	**-0.30%**	**-0.38%**	**-0.31%**	**-0.30%**	**-0.31%**	**-0.31%**	**-0.30%**	**-0.26%**

Source: See Appendix B. Emissions were estimated using EMFAC2021 v1.0.1

The Connector would Divert Traffic from Disadvantaged Communities Along Freeways

The Connector would provide additional transportation access and connectivity in the SACOG region and provide a new high-capacity route that would redirect traffic from other freeways and arterials, especially in the Sacramento region. As shown in Table 6, the MSATs on I-5, Route 50, and SR 99 would decrease with the Connector since the new roadway would divert traffic away from these freeways. On I-5, the decrease in MSATS would average 0.43 percent; the decrease on Route 50 would average 0.75 percent; and the decrease on SR 99 would average 0.31 percent. All MSAT emissions would decrease with the Connector including DPM. This change would reduce the amount of MSATs that the disadvantaged communities along these freeways would be exposed to in the long-term. In addition, diverted vehicles would be traveling in an area where the CalEnviroScreen Scores are 50 and below (see Figure 2) and where there are no disadvantaged communities identified by SACOG or CalEPA, as shown in Figure 3. Therefore, although the Connector would not remove all the emissions from vehicles on I-5, US 50, and SR 99 it would lessen the mobile pollution burden that the communities in proximity to these freeways currently experience by moving traffic to an area where there is not an existing high exposure to traffic emissions or other environmental burdens.

Figure 3: Disadvantaged Communities in the Connector Region



Reductions in air quality pollutants and greenhouse gas emissions are also expected to occur from use of the expanded bicycle network and adoption of electric vehicles to replace some trips currently taken by motor vehicles. While these benefits were not quantified, a qualitative assessment follows.[6]

EXPANDED BICYCLE AND TRANSIT NETWORK

The Connector includes a Class I paved multi-use path along most of the alignment, separated from the roadway by a vegetated buffer. In some areas, buffered bicycle lanes and sidewalks will instead be provided, given the context and proximity of adjacent development. The multi-use path will be connected to local and regional trails, as well as development adjacent to the corridor and transit facilities.

Replacing vehicle trips with bike trips reduces air pollutants, greenhouse gas emissions, and noise. Cycling can also reduce transportation costs and improves public health.

Most of the current roadways that make up the Connector provide no shoulder or a minimal shoulder, presenting an unattractive environment for potential bicyclists or pedestrians along the corridor. Providing a robust and safe bicycle network that is separated from vehicle traffic will provide the opportunity for more people to travel to jobs and commercial services via bicycle. Statewide, if only half of increases in bicycling are offset by less car travel, then annual carbon emissions from that travel would decline by as much as 14 percent (California Department of Public Health 2016). In 2009, approximately 20 percent of all vehicle trips in the United States were under one mile and those short trips could be replaced by bicycling, given the presence of a robust and safe bicycle network (Federal Highway Administration 2009). The advantages of cycling extend beyond reductions in direct emissions of criteria pollutants and GHG emissions. Replacing vehicle trips with bike trips also reduces noise, requires cheaper infrastructure than roads, and improves public health (Heinen et al 2010).

A key aspect of increasing bicycling is to ensure that roadway gaps are closed, whereby any lapse in cyclist facilities along a transportation network is remediated. A continuous bicycle lane encourages travelers to forgo their personal vehicle, as they would be able to easily reach various destinations safely both locally and throughout the Sacramento region. The Connector would provide a shared use path separated from the roadway for cyclists and pedestrians which provides a more comfortable and safer connection for these users and connect to a larger walking and biking network identified in the SACOG Regional Bicycle, Pedestrian, and Trails Master Plan (2022) currently in draft form.

In addition to the Class 1 paved multi-use path, El Dorado Transit is planning a new multimodal transit center adjacent to the corridor. The multimodal transit center will serve as a mobility hub, offering a range of transit options that are easily accessible by walking and biking, further encouraging transit ridership (Kittelson & Associates, Inc. May 2022).

The multiuse path adjacent to the Connector is predicted to more than double the number of cyclists on certain segments of the Connector. Based on travel demand modeling for the Connector[7], approximately 870 additional daily cyclists are expected on the corridor by 2040, a 101 percent increase in the number of cyclists anticipated without the Connector Project.

[6] Quantification of reductions attributed to bicycle facilities would be speculative. While bicycle facilities and electric vehicle infrastructure do provide opportunity for reducing vehicle trips, there are other factors, such as destination, schedule, weather, etc. that also dictate the extent of the daily use of these facilities. Additionally, while the number of cyclists is anticipated to increase, some of that increase would be strictly for the act of bicycling for exercise/entertainment and therefore would not necessarily replace a vehicle trip. Therefore, as a conservative estimate of emissions, reductions due to increased use of bicycles was not quantified.

[7] Documented in the memorandum Travel Demand Model (TDM) Update Summary, Kimley Horn, September 2021

SUPPORT FOR ELECTRIC VEHICLES

Electric vehicles do not emit criteria pollutants or TACs that traditional internal combustion engine vehicles produce. Hybrid vehicles emit fewer pollutants than solely internal combustion-driven vehicles. As electric vehicles replace combustion engines on roadways, criteria pollutants and TACs that are concentrated around roadways will decline. The market share of electric vehicles is anticipated to increase over time.

- As of 2022, approximately 3 percent of California Department of Motor Vehicle (DMV)-registered light-duty vehicles in California are zero emission vehicles. There has been a fairly steady growth in new electric vehicle registrations in Sacramento County between 2010 and 2021. Approximately 61 percent of electric vehicles have been registered since 2017 with approximately 24 percent having been registered between April 2020 and March 2021 (CEC 2022a).
- As of 2022, approximately 2 percent of DMV-registered light-duty vehicles in Sacramento County are zero emission vehicles. There has been a fairly steady growth in new electric vehicle registrations in Sacramento County between 2010 and 2021. Approximately 70 percent of electric vehicles have been registered since 2017 with approximately 32 percent having been registered between April 2020 and March 2021 (CEC 2022a).
- As of April 2022, there are 1,588 medium- and heavy-duty vehicles registered with the DMV in California. Of those 78 are registered within Sacramento County (CEC 2022b).
- There are a total of 79,023 Public and Shared Private Electric Vehicle Charging Stations in California as of April 2022 (CEC 2022c).
- About 39 percent of Americans would be at least somewhat likely to seriously consider purchasing an electric vehicle for their next car (Pew Research Center 2021).
- The internal combustion vehicle market share is expected to reduce to approximately 60 percent by 2030 (Sen et al 2017).

As the Sacramento region continues to build and promote electric vehicle charging infrastructure, the JPA is developing an electric vehicle strategy is to identify a vision and goals to advance electric vehicle deployments along the Connector. As a part of this effort, the JPA has been coordinating with providers of electric vehicle charging stations to identify appropriate locations for future charging stations and coordinate these efforts with existing landowners along the Connector. A greater share of electric vehicles than internal combustion engine vehicles would result in a further reduction in vehicle emissions.

VI. Conclusion

As demonstrated, the Connector project provides a substantial improvement in mobility, access, and safety for the region. The analysis shows the Connector will not degrade air quality or increase GHGs, and therefore will not impede the region from meeting GHG reduction goals. The Project will provide the following air quality and greenhouse gas benefits:

- Reduces regional VMT by 0.01% and congested VMT by 0.75%, and therefore improves air quality and reduces greenhouse gas emissions regionally by 0.73%.
- Reduce mobile pollution burden to communities in proximity to I-5, SR 99, and US 50
- Expands the bicycle network with a separated multi-use path, supporting additional potential reductions in vehicle travel and related emissions and pollutants.
- Supports and advances electric vehicles by coordinating future charging stations. Electric vehicles do not emit criteria pollutants or toxic air contaminants that traditional internal combustion engine vehicles produce.

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Appendix A

Technical Overview for the Air Quality and Greenhouse Gas Memorandum

Air Quality Overview

This Appendix provides an overview of air quality emissions and regulation governing air quality.

Pollutants

Primary criteria pollutants are emitted directly from a source (e.g., vehicle tailpipe, an exhaust stack). The federal and State Clean Air Acts (CAA) mandate the control and reduction of certain air pollutants. Under these laws, the United State Environmental Protection Agency (USEPA), and the California Air Resources Board (CARB) have established the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) for "criteria pollutants" and other pollutants. Some pollutants are emitted directly from a source (e.g., vehicle tailpipe, an exhaust stack of a factory, etc.) into the atmosphere, including carbon monoxide, volatile organic compounds (VOC)/reactive organic gases (ROG),[1] nitrogen oxides (NO_X), particulate matter with diameters of up to ten microns (PM_{10}) and up to 2.5 microns ($PM_{2.5}$), sulfur dioxide, and lead. Other pollutants are created indirectly through chemical reactions in the atmosphere, such as ozone, which is created by atmospheric chemical and photochemical reactions primarily between ROG and NO_X. Secondary pollutants include oxidants, ozone, and sulfate and nitrate particulates (smog). The characteristics, sources and effects of criteria pollutants are discussed in the following subsections. The following subsections describe the characteristics, sources, and health and atmospheric effects of air pollutants of primary concern.

Ozone

Ozone is produced by a photochemical reaction (triggered by sunlight) between NO_X and ROG. ROG are composed of non-methane hydrocarbons (with some specific exclusions), and NO_X is composed of different chemical combinations of nitrogen and oxygen, mainly nitric oxide and nitrogen dioxide. NO_X are formed during the combustion of fuels, while ROG are formed during combustion and evaporation of organic solvents. As a highly reactive molecule, ozone readily combines with many different components of the atmosphere. Consequently, high levels of ozone tend to exist only while high ROG and NO_X levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional rather than local scale, ozone is considered a regional pollutant. In addition, because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans, including changes in breathing patterns, reduction of breathing capacity, increased susceptibility to infections, inflammation of lung tissue, and some immunological changes (Bay Area Air Quality Management District [BAAQMD] 2017a). Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

[1] CARB defines VOC and ROG similarly as, "any compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate," with the exception that VOC are compounds that participate in atmospheric photochemical reactions.

Carbon Monoxide

Carbon monoxide is a localized pollutant that is found in high concentrations only near its source. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is the incomplete combustion of petroleum fuels by automobile traffic. Therefore, elevated concentrations are usually only found near areas of high traffic volumes. Other sources of carbon monoxide include the incomplete combustion of petroleum fuels at power plants and fuel combustion from wood stoves and fireplaces during the winter. The health effects of carbon monoxide are related to its affinity for hemoglobin in the blood. Carbon monoxide causes a number of health problems, including aggravation of some heart diseases (e.g., angina), reduced tolerance for exercise, impaired mental function, and impaired fetal development. At high levels of exposure, carbon monoxide reduces the amount of oxygen in the blood, leading to mortality (BAAQMD 2017a). Carbon monoxide tends to dissipate rapidly into the atmosphere; consequently, violations of the NAAQS and/or CAAQS for carbon monoxide are generally associated with localized carbon monoxide "hotspots" that can occur at major roadway intersections during heavy peak-hour traffic conditions.

Nitrogen Dioxide

Nitrogen dioxide is a by-product of fuel combustion; the primary sources are motor vehicles and industrial boilers and furnaces. The principal form of NO_X produced by combustion is nitric oxide, but nitric oxide reacts rapidly to form nitrogen dioxide, creating the mixture of nitric oxide and nitrogen dioxide commonly called NO_X. Nitrogen dioxide is an acute irritant that can aggravate respiratory illnesses and symptoms, particularly in sensitive groups (BAAQMD 2017a). A relationship between nitrogen dioxide and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light, gives a reddish-brown cast to the atmosphere, and reduces visibility (BAAQMD 2017a). It can also contribute to the formation of PM_{10} and acid rain.

Sulfur Dioxide

Sulfur dioxide is included in a group of highly reactive gases known as "oxides of sulfur." The largest sources of sulfur dioxide emissions are from fossil fuel combustion at power plants (73 percent) and other industrial facilities (20 percent). Smaller sources of sulfur dioxide emissions include industrial processes such as extracting metal from ore and the burning of fuels with a high sulfur content by locomotives, large ships, and off-road equipment. Sulfur dioxide is linked to a number of adverse effects on the respiratory system, including aggravation of respiratory diseases, such as asthma and emphysema, and reduced lung function (BAAQMD 2017a).

Particulate Matter

Suspended atmospheric PM_{10} and $PM_{2.5}$ is comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. Both PM_{10} and $PM_{2.5}$ are directly emitted into the atmosphere as by-products of fuel combustion, wildfire, and wind erosion of soil and unpaved roads. Particulate matter is also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with PM_{10} and $PM_{2.5}$ can be very different. PM_{10} is generally associated with dust mobilized by wind and vehicles while $PM_{2.5}$ is generally associated with combustion processes as well as formation in the atmosphere as a secondary pollutant through chemical reactions. $PM_{2.5}$ is more likely to penetrate deeply into the lungs and poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems (CARB 2022a). More than half of $PM_{2.5}$ that is inhaled into the lungs remains

there. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance. Suspended particulates can also reduce lung function, aggravate respiratory and cardiovascular diseases, increase mortality rates, and reduce lung function growth in children (BAAQMD 2017a).

Lead

Lead is a metal found naturally in the environment, as well as in manufacturing products. The major sources of lead emissions historically have been mobile and industrial sources. However, as a result of the U.S. EPA's regulatory efforts to remove lead from gasoline, atmospheric lead concentrations have declined substantially over the past several decades. The most dramatic reductions in lead emissions occurred prior to 1990 due to the removal of lead from gasoline sold for most highway vehicles. Lead emissions were further reduced substantially between 1990 and 2008, with reductions occurring in the metals industries at least in part as a result of national emissions standards for hazardous air pollutants (USEPA 2014). As a result of phasing out leaded gasoline, metal processing currently is the primary source of lead emissions. The highest level of lead in the air is generally found near lead smelters. Other stationary sources include waste incinerators, utilities, and lead-acid battery manufacturers. The health impacts of lead include behavioral and hearing disabilities in children and nervous system impairment (BAAQMD 2017a).

Toxic Air Contaminants

Toxic air contaminants (TACs) are a diverse group of air pollutants that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. One of the main sources of TACs in California is diesel engine exhaust that contains solid material known as diesel particulate matter (DPM). More than 90 percent of DPM is less than one micron in diameter (about $1/70^{th}$ the diameter of a human hair) and thus is a subset of $PM_{2.5}$. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs (CARB 2022b).

TACs are different than criteria pollutants because ambient air quality standards have not been established for TACs. TACs occurring at extremely low levels may still cause health effects and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TAC impacts are described by carcinogenic risk and by chronic (i.e., long duration) and acute (i.e., severe but of short duration) adverse effects on human health.

Air Pollution Regulation

The federal and state governments have authority under the federal and state CAAs to regulate emissions of airborne pollutants and have established NAAQS and CAAQS for the protection of public health. Federal and state standards have been established for six criteria pollutants, including ozone, CO, NO_2, SO_2, PM_{10} and $PM_{2.5}$, and Pb. Local control in air quality management is provided by CARB through county-level or regional (multi-county) air districts. CARB establishes statewide air quality standards and is responsible for control of mobile emission sources, while the local air districts are responsible for enforcing standards and regulating stationary sources. CARB has established 15 air basins statewide.

Air quality monitoring stations measure pollutant ground-level concentrations (typically, ten feet above ground level). Depending on whether the standards are met or exceeded, the local air basin is classified as in "attainment" or "non-attainment." Some areas are unclassified, which means no monitoring data are available. Unclassified areas are considered to be in attainment. Table 1 lists the current federal and state standards for each of these pollutants as well as the attainment status of the Sacramento Metropolitan Air Quality Management District (SMAQMD). California air quality standards are identical to or stricter than federal standards for all criteria pollutants.

Table 1 Federal and State Ambient Air Quality Standards

		California Standards		National Standards	
Pollutant	**Averaging Time**	**Concentration**	**Attainment Status**	**Concentration**	**Attainment Status**
Ozone	8 Hour	0.070 ppm	N	0.070 ppm	N
	1 Hour	0.09 ppm	N		
Carbon Monoxide	8 Hour	9.0 ppm	A	9 ppm	A
	1 Hour	20 ppm	A	35 ppm	A
Nitrogen Dioxide	1 Hour	0.18 ppm	A	0.100 ppm	U
	Annual Arithmetic Mean	0.030 ppm	A	0.053 ppm	A
Sulfur Dioxide	24 Hour	0.04 ppm	A	0.14 ppm	A
	1 Hour	0.25 ppm	A	0.075 ppm	A
	Annual Arithmetic Mean			0.030 ppm	A
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N		
	24 Hour	50 µg/m^3	N	150 µg/m^3	A
Particulate Matter - Fine ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	A	12 µg/m^3	U/A
	24 Hour			35 µg/m^3	N
Lead	Calendar Quarter			1.5 µg/m^3	A
	Rolling 3 Month Average			0.15 µg/m^3	A
	30 Day Average	1.5 µg/m^3)	A		

A=Attainment N=Nonattainment U=Unclassified; mg/m^3=milligrams per cubic meter ppm=parts per million, µg/m^3=micrograms per cubic meter

Source: USEPA 2022; CARB 2022c

Greenhouse Gas Overview

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period. The term "climate change" is often used interchangeably with the term "global warming," but climate change is preferred because it conveys that other changes are happening in addition to rising temperatures. The baseline against which these changes are measured originates in historical records that identify temperature changes that occurred in the past, such as during previous ice ages. The global climate is changing continuously, as evidenced in the geologic record which indicates repeated episodes of substantial warming and cooling. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming over the past 150 years. The United Nations Intergovernmental Panel on Climate Change (IPCC) expressed that the rise and continued growth of atmospheric CO_2 concentrations is unequivocally due to human activities in the IPCC's Sixth Assessment Report (2021). Human influence has warmed the atmosphere, ocean, and land, which has led the climate to warm at an unprecedented rate in the last 2,000 years. It is estimated that between the period of 1850 through 2019, that a total of 2,390 gigatons of anthropogenic CO_2 was emitted. It is likely that anthropogenic activities have increased the global surface temperature by approximately 1.07 degrees Celsius between the years 2010 through 2019 (IPCC 2021). Furthermore, since the late 1700s, estimated concentrations of CO_2, methane, and nitrous oxide in the atmosphere have increased by over 43 percent, 156 percent, and 17 percent, respectively, primarily due to human activity (USEPA 2021). Emissions resulting from human activities are thereby contributing to an average increase in Earth's temperature

Gases that absorb and re-emit infrared radiation in the atmosphere are called GHGs. The gases widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere, and natural processes, such as oceanic evaporation, largely determine its atmospheric concentrations.

GHGs are emitted by natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are usually by-products of fossil fuel combustion, and CH_4 results from off-gassing associated with agricultural practices and landfills. Human-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (USEPA 2021).

Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" (CO_2e), which is the amount of GHG emitted multiplied by its GWP. Carbon

dioxide has a 100-year GWP of one. By contrast, methane has a GWP of 30, meaning its global warming effect is 30 times greater than CO_2 on a molecule per molecule basis (IPCC 2021).[2]

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat-trapping effect of GHGs, the earth's surface would be about 33 degrees Celsius (°C) cooler (World Meteorological Organization 2022). However, since 1750, estimated concentrations of CO_2, CH_4, and N_2O in the atmosphere have increased by 47 percent, 156 percent, and 23 percent, respectively, primarily due to human activity (IPCC 2021). GHG emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, are believed to have elevated the concentration of these gases in the atmosphere beyond the level of concentrations that occur naturally.

Globally, climate change has the potential to affect numerous environmental resources though potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The observed global mean surface temperature from 2015 to 2017 was approximately 1.0°C higher than the average global mean surface temperature over the period from 1880 to 1900 (National Oceanic and Atmospheric Administration 2020). Furthermore, several independently analyzed data records of global and regional Land-Surface Air Temperature obtained from station observations jointly indicate that Land-Surface Air Temperature and sea surface temperatures have increased.

According to *California's Fourth Climate Change Assessment*, statewide temperatures from 1986 to 2016 were approximately 0.6 to 1.1°C higher than those recorded from 1901 to 1960. Potential impacts of climate change in California may include reduced water supply from snowpack, sea level rise, more extreme heat days per year, more large forest fires, and more drought years (State of California 2018). In addition to statewide projections, *California's Fourth Climate Change Assessment* includes regional reports that summarize climate impacts and adaptation solutions for nine regions of the state and regionally specific climate change case studies (State of California 2018). However, while there is growing scientific consensus about the possible effects of climate change at a global and statewide level, current scientific modeling tools are unable to predict what local impacts may occur with a similar degree of accuracy. A summary follows of some of the potential effects that could be experienced in California as a result of climate change.

Potential Effects of Climate Change

Air Quality

Scientists project that the annual average maximum daily temperatures in California could rise by 2.4 to 3.2°C in the next 50 years and by 3.1 to 4.9°C in the next century (State of California 2018). Higher temperatures are conducive to air pollution formation, and rising temperatures could therefore result in worsened air quality in California. As a result, climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. In addition, as temperatures have increased in recent years, the area burned by wildfires throughout the state has increased, and wildfires have occurred at higher elevations in

[2] The Intergovernmental Panel on Climate Change's (2021) *Sixth Assessment Report* determined that methane has a GWP of 30. However, the 2017 Climate Change Scoping Plan published by the California Air Resources Board uses a GWP of 25 for methane, consistent with the Intergovernmental Panel on Climate Change's (2007) *Fourth Assessment Report*. Therefore, this analysis utilizes a GWP of 25.

the Sierra Nevada Mountains (State of California 2018). If higher temperatures continue to be accompanied by an increase in the incidence and extent of large wildfires, air quality could worsen. Severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains could tend to temporarily clear the air of particulate pollution, which would effectively reduce the number of large wildfires and thereby ameliorate the pollution associated with them (California Natural Resources Agency 2009).

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future precipitation trends and water supplies in California. Year-to-year variability in statewide precipitation levels has increased since 1980, meaning that wet and dry precipitation extremes have become more common (California Department of Water Resources 2018). This uncertainty regarding future precipitation trends complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The average early spring snowpack in the western U.S., including the Sierra Nevada Mountains, decreased by about 10 percent during the last century. During the same period, sea level rose over 0.15 meter along the central and southern California coasts (State of California 2018). The Sierra snowpack provides the majority of California's water supply as snow that accumulates during wet winters is released slowly during the dry months of spring and summer. A warmer climate is predicted to reduce the fraction of precipitation that falls as snow and the amount of snowfall at lower elevations, thereby reducing the total snowpack (State of California 2018). Projections indicate that average spring snowpack in the Sierra Nevada and other mountain catchments in central and northern California will decline by approximately 66 percent from its historical average by 2050 (State of California 2018).

Hydrology and Sea Level Rise

Climate change could affect the intensity and frequency of storms and flooding (State of California 2018). Furthermore, climate change could induce substantial sea level rise in the coming century. Rising sea level increases the likelihood of and risk from flooding. The rate of increase of global mean sea levels between 1993 to 2020, observed by satellites, is approximately 3.3 millimeters per year, double the twentieth century trend of 1.6 millimeters per year (World Meteorological Organization 2013; National Aeronautics and Space Administration 2020). Global mean sea levels in 2013 were about 0.23 meter higher than those of 1880 (National Aeronautics and Space Administration 2020). Sea levels are rising faster now than in the previous two millennia, and the rise will probably accelerate, even with robust GHG emission control measures. The most recent IPCC report predicts a mean sea level rise ranging between 0.25 to 0 1.01 meters by 2100 with the sea level ranges dependent on a low, intermediate, or high GHG emissions scenario (IPCC 2021). A rise in sea levels could erode 31 to 67 percent of southern California beaches and cause flooding of approximately 370 miles of coastal highways during 100-year storm events. This would also jeopardize California’s water supply due to saltwater intrusion and induce groundwater flooding and/or exposure of buried infrastructure (State of California 2018). Furthermore, increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture

California has an over $50 billion annual agricultural industry that produces over a third of the country's vegetables and two-thirds of the country's fruits and nuts (California Department of Food and Agriculture 2020). Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, certain regions of agricultural production could experience water shortages of up to 16 percent, which would increase water demand as hotter conditions lead to the loss of soil moisture. In addition, crop yield could be threatened by water-induced stress and extreme heat waves, and plants may be susceptible to new and changing pest and disease outbreaks (State of California 2018). Temperature increases could also change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (California Climate Change Center 2006).

Ecosystems

Climate change and the potential resultant changes in weather patterns could have ecological effects on the global and local scales. Soil moisture is likely to decline in many regions as a result of higher temperatures, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: timing of ecological events; geographic distribution and range of species; species composition and the incidence of nonnative species within communities; and ecosystem processes, such as carbon cycling and storage (Parmesan 2006; State of California 2018).

Regulatory Framework

In response to climate change, California implemented Assembly Bill (AB) 32, the "California Global Warming Solutions Act of 2006." AB 32 required the reduction of statewide GHG emissions to 1990 emissions levels (essentially a 15 percent reduction below 2005 emission levels) by 2020 and the adoption of rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions. On September 8, 2016, the Governor signed Senate Bill 32 into law, extending AB 32 by requiring the State to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, the CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program and the Low Carbon Fuel Standard, and implementation of recently adopted policies and legislation, such as SB 1383 (aimed at reducing short-lived climate pollutants including methane, hydrofluorocarbon gases, and anthropogenic black carbon) and SB 100 (discussed further below). The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends local governments adopt policies and locally-appropriate quantitative thresholds consistent with a statewide per capita goal of six metric tons (MT) of CO_2e by 2030 and two MT of CO_2e by 2050 (CARB 2017).

Other relevant state laws and regulations include:

- **SB 375**: The Sustainable Communities and Climate Protection Act of 2008 (SB 375), signed in August 2008, enhances the state's ability to reach AB 32 goals by directing the CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. Metropolitan Planning Organizations are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the Metropolitan Planning Organization's Regional Transportation Plan (RTP). On March 22, 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. The Sacramento Area Council Council of Governments (SACOG) was assigned targets of seven percent reduction in per capita GHG emissions from passenger vehicles from 2005 levels by 2020 and is assigned a 19 percent reduction in per capita GHG emissions from passenger vehicles from 2005 levels by 2035. SACOG adopted the 220 Metropolitan Transportation Plan/Sustainable Communities Strategy in November 2019, which meets the requirements of SB 375 (SACOG 2019).

Model Technical Overview

To quantify air quality, mobile source air toxic (MSAT), and greenhouse gas (GHG) emissions two models were used: California Air Resources Board EMissions FACtor 2021 model (EMFAC2021 v1.0.1) and the California Department of Transportation (Caltrans) Emission Factor 2017 model (CT-EMFAC2017). The following sections describe the models in more detail.

EMFAC2021

General Summary

EMFAC2021 is CARB's statewide mobile source emissions inventory model. This is model capable of calculating statewide or regional emissions using emission factors and vehicle activity data from all motor vehicles including cars, trucks, and buses in California.

Emissions from mobile sources are the product of an emission factor multiplied by a source activity. Units for the emission factor can be expressed as mass of a pollutant per mile driven (e.g., grams of PM_{10} per mile), per vehicle per day, or per trip per day. The source activity could be miles driven (e.g., vehicle miles traveled [VMT]), number of vehicles, or number of trips. Emissions are then presented in a mass unit (e.g., grams or tons) per a specific timeframe (e.g., day or year) or activity.

$$Emission\ Factors\ x\ Souce\ Activity = Emissions$$

The model supports CARB's regulatory efforts for air quality and to meet the Federal Highway Administration transportation planning requirements. EMFAC2021 is the latest state model that reflects the most recent data on California's fleet mix for cars and trucks and rulemaking from the federal and State level. There is a software version and a web platofrm where users can download default activity emissin factors; compute emissions using custom inputs; and generate emission factors with specific information including user-defined ambient temprature and realtive humidity for project-level assessment (CARB 2021). The model calcualtes emission factors and emissions inventories for the following:

- Carbon monoxide (CO)
- Nitrogen oxides (NO_x)
- Total organic gases (TOG)
- Reactive organic gases (ROG)
- Particulate matter (PM): Particulate matter estimates are provided for total suspended particulates (PM), with diameter 10 microns or less (PM_{10}), and with diameter 2.5 microns or less ($PM_{2.5}$)
- Sulfur oxides (SO_x)
- Greenhouse Gases (GHG): GHG emissions consist of complete combustion of carbon dioxide (CO_2), Nitrous Oxide (N_2O) and Methane (CH_4)
- Ammonia (NH_3): NH_3 is a newly added pollutant in EMFAC2021
- Fuel: Although fuel is not a pollutant, fuel consumption is calculated based on the tailpipe emissions of CO, CO_2 and total hydrocarbon (HC) using the carbon balance equation

New Updates

Compared to its modeling predecessor EMFAC2017, EMFAC2021 includes several new features and new regulatory inclusions to reflect the most relevant and appropriate data. The updates most relevant to the Connector are listed below:

- **Inclusion of Plug-in Hybrid Electrical Vehicles and Natural Gas Powered Vehicles**. The plug-in hybrid data was developed from CARB's real-world emission testing and vehicle data collections programs. The natural gas vehicle emission rates are also based on real-world emission testing and the natural gas vehicle activity is based on historical vehicle registration database.
- **Forecasting Approach for Light-duty Vehicle Activity**: EMFAC2021 uses socioeconomic data from UCLA Anderson Forecast (UCLA), California Department of Finance (DOF), California Board of Equalization (BOE), California Energy Commission (CEC), and Federal Reserve Bank of St. Louis and a dynamic program approach using said data to estimate the new vehicle sales and VMT forecasting for light-duty vehicles.
- **Forecasting Approach for Heavy-duty VMT**: EMFAC2021 uses the California Statewide Travel Demand Model that forecasts VMT by county as the primary source for the future VMT trends to better reflect the regional disparities in freight VMT growth. The EMFA2017 model used a general regression model fitted to historical diesel fuel sales data.
- **Forecasting Approach for Zero-emissions Vehicles (ZEV)**: EMFAC2021 uses California Energy Commission's (CEC) vehicle choice model coupled with CARB's updated ZEV input attributes for short-term projections (2020-2030). For long-term projections (2031-2050), the ZEV market share is assumed to plateau in California, starting in 2030.
- **Updated Population Data**: EMFAC2021 uses population data for the years 2000 through 2019 from the Department of Motor Vehicle; most recent international registration plan data to estimate heavy-duty vehicle population; vehicle identification numbers from the California Highway Patrol for school buses and drayage trucks; and the national transit database for transit bus activity.
- **VMT Options**: EMFAC2021 includes total daily VMT but further separates the VMT into VMT from conventional fuel vehicles (cVMT) and VMT from electric vehicles (eVMT). The total VMT is the sum of cVMT and eVMT. Note that VMT from plug-in hybrid electrical vehicles are accounted for in both cVMT and eVMT activity.

Regulations and Policies

Polices and regulations that are accounted for in EMFAC2021 include the following:

- **HD Warranty Phase 1**: This regulation is designed to reduce emission of NO_x and PM by requiring manufactures to lengthen the warranty mileages of heavy-duty vehicles. The reductions for both pollutants is incorporated into EMFAC2021.
- **Innovative Clean Transit**: This regulation, adopted in 2018, requires that public transit agencies gradually transition to 100 percent zero-emission bus fleets, and it encourages first and last-mile services for transit riders. The requirement for 100 percent ZEV buses is 2029.
- **Amendments to Heavy-Duty Vehicle Inspection Program and Periodic Smoke Inspection Program**: This program reduces diesel particulate matter from diesel-powered vehicles that have a gross vehicle weight rating above 14,000 pounds. The PM emissions in EMFAC2021 include the reductions in diesel particulate matter.

- **Advanced Clean Trucks**: In June 2020, CARB approved the Advanced Clean Trucks regulation, which requires manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. In addition, the regulation requires company and fleet reporting for large employers and fleet owners with 50 or more trucks. CARB estimates that implementation of this regulation will reduce GHG emissions by a total of approximately 29 MMT of CO_2e between 2020 and 2040 relative to the business-as-usual baseline. By 2040, emissions are expected to be reduced by approximately four percent annually compared to the business as usual forecast. By 2045, all new trucks sold in California must be zero-emission. EMFAC2021 reflects ACT by modelling heavy-duty ZEVs based on the sales percentage requirements for each model year and those percentages were applied to vehicles first sold or certified in California.
- **Heavy-Duty Omnibus:** This regulation is an update to heavy-duty engine NO_x emissions and requires that NO_x emissions are further reduced for vehicles with a gross vehicle weight rating exceeding 10,000 pounds. The lower engines rates for NO_x are reflected in EMFAC2021.
- **Safer Affordable Fuel-Efficient Vehicle Rules and Actions:** On September 27, 2019, the United States Environmental Protection Agency (USEPA) and the National Highway Traffic Safety Administration published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program. The SAFE Rule Part One revokes California's authority to set its own GHG emissions standards and to adopt its own zero-emission vehicle mandates. On April 30, 2020, the U.S. E.PA and the National Highway Traffic Safety Administration published Part Two of the SAFE Vehicles Rule, which revised corporate average fuel economy and CO_2 emissions standards for passenger cars and trucks of model years 2021-2026 such that the standards increase by approximately 1.5 percent each year through model year 2026 as compared to the approximately five percent annual increase required under the 2012 standards (National Highway Traffic Safety Administration 2020). EMFAC2021 accounts for the SAFE ruling for gasoline-fueled passenger cars and light-duty trucks.

Methodology – Scenario Generation Mode

To compute mobile air quality and GHG emissions from EMFAC2021, the Scenario Generation Mode was used. This is a custom activity option to calculated emission inventories from VMT data. The Scenario Generator generates an input activity data file that can be modified to load custom data and said input file is then processed to create an emissions inventory report. The custom data inputs that a user is allowed to modify are the following:

- **Model:** EMFAC2021 v1.0.1 or EMFAC2017 v1.0.3
- **Region Type:** Influences emission factors used since the rates differ depending on analysis area
  - Sub-area: a combination of county, air basin, and air district
  - County
  - Metropolitan Planning Organization
  - Air District
  - Air Basin
  - Statewide
- **Calendar Year:** Influences the emission factors since EMFAC is a forecasting model that adjust years to account for future regulation requirements and changes in vehicle activity

- **Season:** Influences time of year emissions are analyzed
  - Annual, Winter, or Summer
- **VMT Data Type**
  - Total Daily VMT: Scales emissions by vehicle category using VMT total only
  - VMT by Vehicle and Fuel Type: Scale emissions by vehicle category using VMT and speed bin data by vehicle type
- **Senate Bill 375:** This option should only be checked if the transportation assessment being prepared is to fulfill Senate Bill 375 requirements.

The input file is then processed and three report options are available.

- **Comma-Separated Values:** This is a text file that uses a comma to separate files.
- **Planning Inventory:** This is a Microsoft Excel Workbook that organizes emissions by area, calendar year, and vehicle type.
- **CEIDARS Transaction Format:** This is a report type used internally by CARB for internal emission inventory database and forecasting system.

Methodology – Connector Project

For the Capital SouthEast Connector project (Connector), daily VMT and congested VMT were analyzed using the Scenario Generator. Table 2 shows the daily and daily congested VMT with and without the Connector.

Table 2 Daily VMT and Daily Congested VMT with and without the Connector

	Daily VMT	Daily Congested VMT
With Connector	74,555,224	5,365,589
Without Connector	74,561,768	5,405,558

The following inputs were chosen for the project-specific analysis. The only difference between the With and Without Connector scenarios was the daily total VMT. The inputs are as follows:

- **Model:** EMFAC2021 v1.0.1
- **Region Type:** Metropolitan Planning Organization
  - Sacramento Area Council of Government's
- **Calendar Year:** 2040
- **Season:** Annual
- **VMT Data Type:** Total Daily VMT
  - The total daily VMT changed for the With and Without Connector Scenarios
- **Senate Bill 375:** This option was not checked

For the report options, the Planning Inventory output was used for all scenarios analyzed.

Fleet Mix

As described above, EMFAC is a forecasting model that adjust emission factors based on region and year selected. To demonstrate the differences in forecasting within EMFAC2021, the fleet mix or vehicle distribution per vehicle category for the year 2022 and the year 2040 were compared. Table 3 shows the percentage change in the fleet mix for cVMT, eVMT, and per vehicle category. For simplicity, the nomenclature for the EMFAC2007 vehicle categories is used. Refer to Section 6.1 of the EMFAC2021 Volume III Technical Document for a complete list of vehicle categories. Note that these are forecasted changes and are not attributed to the Connector project.

Table 3 Fleet Mix in 2022 and 2040 in the SACOG Region

Vehicle Category	2022	2040	Difference
cVMT	97.63%	88.60%	-9.04%
eVMT	2.37%	11.40%	9.04%
LDA	47.52%	48.73%	1.21%
LDT1	4.49%	2.83%	-1.66%
LDT2	22.09%	24.85%	2.76%
LHDT1	4.49%	2.53%	-1.96%
LHDT2	22.09%	0.64%	-21.45%
MDV	15.02%	13.93%	-1.08%
MH	0.12%	0.06%	-0.07%
MCY	0.40%	0.32%	-0.08%
MHDT	1.81%	2.26%	0.45%
HHDT	3.16%	3.49%	0.33%
SBUS	0.08%	0.07%	-0.01%
UBUS	0.12%	0.15%	0.03%
OBUS	0.15%	0.09%	-0.06%

VMT = vehicle miles travled; cVMT = conventional vehicle VMT; eVMT = electric vehicle VMT; LDA = light-duty automobile; LDT = light-duty truck; LHDT = light-heavy duty vehicle; MDV = medium duty vehicle; MH = motorhome; MCY = motorcycle; MHDT = medium heavy-duty truck; HHDT = heavy-heavy duty truck; SBUS = school bus; UBUS = urban bus; OBUS = transit bus

CT-EMFAC2017

General Summary

CT-EMFAC2017 version 1.0.2 is an on-road vehicle emission modeling tool that computers emissions for criteria pollutants, MSATs, and GHG emissions. The model also calculates fuel consumption. The model calculates emission factors and total emissions from on-road motor vehicles at the project level in California. CT-EMFAC2017 is a software that users can generate emission factors with specific information and compute emissions using custom input including truck percentage, road road sufrace silt loading factor, and precipiation correction (Caltrans 2019). The model calculates emission factors and emissions inventories for the following:

- **Criteria Pollutants**
  - $PM_{2.5}$
  - PM_{10}
  - NO_x
  - CO
  - TOG
  - ROG
  - HC
- **MSATs**
  - 1,3-Butadiene
  - Acetaldehyde
  - Acrolein
  - Benzene
  - Diesel PM
  - Ethylbenzene
  - Formaldehyde
  - Naphthalene
  - Polycyclic Organic Matter
  - Diesel Exhaust Organic Gas
- **GHG**
  - CO_2
  - N_2O
  - CH_4
  - Black Carbon (BC)
  - Hydrofluorocarbons (HFC)
- **Fuel**
  - Fuel consumption is calculated based running exhaust for gasoline and diesel fuel vehicles

Similar to EMFAC2021, emissions from mobile sources are the product of an emission factor multiplied by a source activity. Emission factors are expressed a grams per mile and are influenced by parameters, such as vehicle type, fuel type, vehicle age, and model year. Total emissions are expressed as grams per day. Unlike EMFAC2021, the CT-EMFAC2017 incorporates EMFAC2017 emission factors for criteria pollutant and GHG emissions, which is an older version of EMFAC. The MSAT emission factors are based on speciation profiles (chemical composition of emissions) from the USEPA and CARB. The MSAT emission factors were manually derived for the 10 MSATs included in CT-EMFAC. Note that the CARB EMFAC model does not provide emission factors for MSATs.

Methodology – Manual Mode

To compute mobile air quality and GHG emissions from EMFAC2021, the Manual Mode was used. This is a custom activity option to calculated emission inventories from individual roadway links, where a link is a section of roadway where travel activity is uniform. This is the only mode in CT-EMFAC that can output emission factors and consumption factors for fuel (gallon/mile). The Manual Mode prompts the user to create an input file of emission factors that are then used to quantify emissions for the roadway link. The custom data inputs that a user is allowed to modify are the following:

- **Area:** Influences emission factors used since the rates differ depending on analysis area. The areas are based on CARB defined air basins and county map boundaries.
  - County
  - Air Basin
  - Air District (only for Riverside County)
- **Calendar Year:** Influences the emission factors since CT-EMFAC is a forecasting model that adjust years to account for future regulation requirements and changes in vehicle activity
- **Season:** Influences time of year emissions are analyzed
  - Annual, Winter, or Summer
- **Vehicle Fleet Mix:** The proportion of vehicle categories expressed as percentages of Non-Truck and Truck Vehicles. User can also be more specific by defining Truck 1 and Truck 2 percentages. Truck 1 is defined as light-duty and light heavy-duty trucks with a gross vehicle weight rating ranging from 8,501 to 14,000 pounds. Truck 2 is defined as medium-heavy duty and heavy-heavy duty trucks that exceed 14,000 pounds.
  - EMFAC2017 Default Fleet Mix
  - Project-Specific Truck/Non-Truck
  - Project-Specific Truck 1/Truck 2/Non-Truck
- **Pollutants:** User can select groups of pollutants and consumption or individual pollutants
  - General Criteria Pollutants
  - MSATs
  - GHGs
  - Fuel Consumption
- **Road Surface Silt Loading Factor:** This is the amount of silt per area on the roadway surface. There is typically lower silt loading on freeways than local roadways.
  - CARB: User must define the roadway as freeway, major/collector, local urban, or local rural.
  - User-defined: User must provide a silt loading factor (grams per square meter)
- **Precipitation Correction:** Precipitation decreases the total road dust emissions on roadways.
  - CARB: inputs are dependent on area selected
  - User-defined number of precipitation days
  - None

Using the emission factor file created, emissions are generated under the Emissions scenario. The following parameters must be selected prior to running the emissions model:

- **Link Length:** Entered as the number of miles the roadway link would be
- **Time Period Information:** Expressed as a number of hours and is used to calculate the total fleet Volume.
- **Volume:** Entered as a rate (in units of vehicles per hour). A number of hours (# Hours) for the time period is entered separately, and the two values are multiplied to obtain the total
- **Speed:** Specified in terms of a VMT distribution by Speed Bin. The resulting emissions are summed across all Speed Bins

Once these travel activity paramters are chosen, the user can run a total emissions output.

Methodology – Connector Project

For the Connector, daily VMT for Interstate 5 (I-5), United States Route 50 (Route 50), and State Route 99 (SR 99) were analyzed using the Manual Mode in CT-EMFAC2021. Table 4 shows the daily and daily congested VMT with and without the Connector.

Table 4 Daily VMT with and without the Connector on Freeways

Freeway	No Connector Daily VMT	With Connector Daily VMT
Interstate 5	1,225,654	1,220,422
United States Route 50	3,090,005	3,066,893
State Route 99	2,479,541	2,471,970

The following inputs were chosen for the project-specific analysis. The only difference between the With and Without Connector scenarios was the daily total VMT. The inputs are as follows:

- **Area**
  - County: Sacramento
- **Calendar Year**
  - 2040
- **Season**
  - Annual
- **Vehicle Fleet Mix**
  - Project-Specific Truck/Non-Truck (refer to the discussion below for more specifics)
- **Pollutants:** All functions were included but only the MSAT emissions were used
  - General Criteria Pollutants
  - MSATs
  - GHGs
  - Fuel Consumption
- **Road Surface Silt Loading Factor**
  - CARB road surface silt loading factor for a freeway

- **Precipitation Correction**
  - CARB default assumptions for Sacramento
  - User-defined number of precipitation days
  - None

For the Emission scenario travel activity, the total daily VMT for each freeway was inputted into the link length input. The purpose of the travel activity is to determine VMT per roadway link and for this project that feature was overriden because VMT was already provided. For the volume and number of hours, both inputs were left as one so the travel activity product would remain the project-specific daily VMT. For the VMT districution by speed bin, the EMFAC2017 default fleet average distrubtion was used for all scenarios. Speed bin data for the Connector was not available at the time of analysis.

Fleet Mix

As described above, CT-EMFAC allows the users to modify the percentage of non-trucks and trucks in the fleet mix. To model the most recent truck traffic on I-5, Route 50, and SR-99, the 2020 annual average daily truck traffic from Caltrans was used. The data provides approximate truck percentages for segments of the freeway. The truck percentages for all segments of the freeway were summed then averaged. The average truck percentage was used for each respective freeway and the non-truck percentage was adjusted so the total percentage equated to 100 percent. Table 5 shows the non-truck and truck percentages for I-5, Route 50, and SR 99. For comparison, the 2022 vehicle fleet mix assumed in CT-EMFAC20217 is 92.7 percent non-truck and 7.3 percent truck. This is a general fleet mix for the Sacramento area and the 2022 fleet mix does not account for specific truck travel on freeways like the percentages shown in Table 5

Table 5 Fleet Mix in 2040 in the SACOG Region

Vehicle Category	Non-Truck %	Truck %
Interstate 5	86.7%	13.3%
United States Route 50	95.5%	4.5%
State Route 99	90.6%	9.4%

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Appendix B

Emissions Summaries and Modeling Data

Criteria Pollutant and GHG Emissions

CAPITAL SOUTHEAST CONNECTOR

Methodology

Air quality and GHG emissions were computed using the VMT provided by Kittleson & Associates Inc., and the CARB EMission FACtor 2021 model (EMFAC2021). The Scenario Analysis for EMFAC2021 was used assuming the region type would be for SACOG, the buildout year would be 2040, and the season would be annual. Air quality emissions are provided for total organic gases (TOG), ROG, NO_x, PM_{10}, $PM_{2.5}$, CO, and sulfur oxide (SO_x). GHG emissions are provided for carbon dioxide (CO_2). Air quality emissions are in tons per day, while CO_2 emissions were converted into metric tons (MT) per day.

Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT)

Constrained 2040 Connector Scenario - WP Assignment Only (Fixed Trips)			
	Daily VMT - SACOG	Daily Congested VMT - SACOG	Daily VHT - SACOG
With Project (Fixed Trips)	74,555,224	5,365,589	2,232,994
No Project	74,561,768	5,405,558	2,236,293
Difference	(6,544)	(39,970)	(3,300)
% Difference	-0.01%	-0.74%	-0.15%

Note:
VMT summarized for the entire SACOG region.
Congested VMT is VMT for V/C > 1.

Bike Ridership

Cyclist Estimates					
Segment	Existing Connector Cyclists	2040 Without Connector Cyclists	2040 With Connector Cyclists	Difference with Addition of Connector	Percentage Difference
A1	21	140	276	136	97%
A2	22	148	281	133	90%
B1	13	59	92	33	56%
B2	14	88	169	81	92%
B3	16	112	227	115	103%
C	4	32	69	37	116%
D1	1	10	18	8	80%
D2	14	114	250	136	119%
D3	19	156	346	190	122%

Notes: Daily ridership is presented above

Criteria Air Pollutant and GHG Emissions

Scenario	Daily VMT	TOG (tons/day)	ROG (tons/day)	NO_x (tons/day)	PM_{10} (tons/day)[1]	$PM_{2.5}$ (tons/day)[1]	Total PM (tons/day)	Fugitive PM_{10} (tons/day)[2]	Fugitive $PM_{2.5}$ (tons/day)[2]	Total Fugitive PM_{10} (tons/day)[2]	CO (tons/day)	SOx (tons/day)	CO_2 (tons/day)	CO_2 (metric tons/day)
No Build VMT														
On-Road Motor Vehicles	74,561,768	3.024	2.4774	11.5069	2.0505	0.7326	2.7831	0.5888	0.5888	1.1775	66.4101	0.2539	25,696	22,943
Build VMT														
On-Road Motor Vehicles	74,555,224	3.024	2.4772	11.5061	2.0503	0.7326	2.7829	0.5887	0.5887	1.1774	66.4044	0.2538	25,694	22,941
No Build Congested VMT														
On-Road Motor Vehicles	5,405,558	0.220	0.178	0.796	0.146	0.052	0.198	0.042	0.042	0.084	4.833	0.018	1,839	1,642
Build Congested VMT														
On-Road Motor Vehicles	5,365,589	0.218	0.177	0.790	0.145	0.051	0.196	0.042	0.042	0.083	4.797	0.018	1,826	1,630
Difference (Build VMT - No Build VMT)	-6,544	0.000	-0.0002	-0.0008	-0.0002	-0.0001	-0.0002	0.0000	0.0000	-0.0001	-0.0058	-0.00002	-2.0981	-2
%	-0.01%	-0.009%	-0.008%	-0.007%	-0.008%	-0.008%	-0.008%	-0.008%	-0.008%	-0.008%	-0.009%	-0.008%	-0.008%	-0.008%
Difference (Build Congested VMT - No Build Congested VMT)	-39,970	-0.002	-0.001	-0.006	-0.001	-0.0004	-0.001	0.000	0.000	-0.001	-0.036	-0.0001	-13.365	-12
%	-0.74%	-0.77%	-0.75%	-0.75%	-0.73%	-0.73%	-0.73%	-0.73%	-0.73%	-0.73%	-0.75%	-0.72%	-0.73%	-0.73%

Notes
Annual emissions
1) Includes tire and break wear in the total PM
2) Includes only tire and break wear

EMFAC2021 Output

EMFAC2021 Connector Congested VMT

Area	Sub-Area	Cal. Year	Season	Veh_Tech	EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS	TOG_TOTAL	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS	ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX	NOx_IDLEX
SACOG	All Sub-Areas	2040	Annual	All Vehicles	All Vehicles	143,820.4	5,365,588.7	4,753,860.4	611,728.2	725,623.3	0.0751	0.0125	0.1307	0.2183	0.1959	0.0600	0.1590	0.6332	0.0487	0.0090	0.1194	0.1772	0.1959	0.0600	0.1590	0.5920	3.25	0.1446	1.41	4.80	0.4553	0.1154
SACOG	All Sub-Areas	2040	Annual	All Other Buses-Dsl	All Other Buses - Dsl	58.0	3,002.6	3,002.6	0	516.6	0.0002	0.0000		0.0002				0.0002	0.0002	0.0000		0.0002				0.0002	0.0007	0.0001		0.0008	0.0038	0.0001
SACOG	All Sub-Areas	2040	Annual	All Other Buses-NG	All Other Buses - Oth	7.65	402.6	402.6	0	68.1	0.0004	0.0000		0.0004				0.0004	0.0000	0.0000		0.0000				0.0000	0.0015	0.0001		0.0016	0.0001	0.0000
SACOG	All Sub-Areas	2040	Annual	LDA-Dsl	LDA - Dsl	49.0	1,450.0	1,450.0	0	207.8	0.0000			0.0000				0.0000	0.0000			0.0000				0.0000	0.0003			0.0003	0.0001	
SACOG	All Sub-Areas	2040	Annual	LDA-Elec	LDA - Oth	7,419.9	306,974.7	0	306,974.7	35,053.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LDA-Gas	LDA - Gas	58,256.5	2,199,133.1	2,199,133.1	0	268,483.0	0.0120		0.0492	0.0612	0.0746	0.0145	0.0530	0.2032	0.0082		0.0449	0.0531	0.0746	0.0145	0.0530	0.1952	1.31		0.5444	1.86	0.0514	
SACOG	All Sub-Areas	2040	Annual	LDA-Phe	LDA - Gas	2,657.4	104,846.3	43,295.8	61,550.5	10,988.5	0.0002		0.0023	0.0025	0.0025	0.0005	0.0010	0.0065	0.0002		0.0021	0.0022	0.0025	0.0005	0.0010	0.0062	0.0229		0.0160	0.0389	0.0003	
SACOG	All Sub-Areas	2040	Annual	LDT1-Dsl	LDT1 - Dsl	0.0471	1.63	1.63	0	0.2077	0.0000			0.0000				0.0000	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000	
SACOG	All Sub-Areas	2040	Annual	LDT1-Elec	LDT1 - Oth	93.0	3,983.3	0	3,983.3	444.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LDT1-Gas	LDT1 - Gas	4,298.3	145,135.6	145,135.6	0	18,983.0	0.0011		0.0045	0.0056	0.0097	0.0017	0.0067	0.0237	0.0008		0.0041	0.0049	0.0097	0.0017	0.0067	0.0230	0.0998		0.0448	0.1446	0.0044	
SACOG	All Sub-Areas	2040	Annual	LDT1-Phe	LDT1 - Gas	70.9	2,967.7	1,210.2	1,757.5	293.4	0.0000		0.0001	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000		0.0001	0.0001	0.0000	0.0000	0.0000	0.0001	0.0006		0.0004	0.0011	0.0000	
SACOG	All Sub-Areas	2040	Annual	LDT2-Dsl	LDT2 - Dsl	127.5	4,795.6	4,795.6	0	588.3	0.0001			0.0001				0.0001	0.0001			0.0001				0.0001	0.0008			0.0008	0.0002	
SACOG	All Sub-Areas	2040	Annual	LDT2-Elec	LDT2 - Oth	1,136.7	33,430.9	0	33,430.9	5,420.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LDT2-Gas	LDT2 - Gas	34,186.5	1,264,412.5	1,264,412.5	0	156,517.3	0.0095		0.0358	0.0453	0.0492	0.0091	0.0359	0.1395	0.0065		0.0327	0.0392	0.0492	0.0091	0.0359	0.1334	0.8837		0.3899	1.27	0.0357	
SACOG	All Sub-Areas	2040	Annual	LDT2-Phe	LDT2 - Gas	819.4	32,597.2	13,379.6	19,217.6	3,388.4	0.0001		0.0007	0.0008	0.0006	0.0001	0.0002	0.0017	0.0000		0.0006	0.0007	0.0006	0.0001	0.0002	0.0016	0.0071		0.0049	0.0120	0.0001	
SACOG	All Sub-Areas	2040	Annual	LHD1-Dsl	LHD1 - Dsl	1,143.5	37,145.3	37,145.3	0	14,384.4	0.0054	0.0002		0.0055				0.0055	0.0047	0.0001		0.0049				0.0049	0.0129	0.0011		0.0141	0.0262	0.0018
SACOG	All Sub-Areas	2040	Annual	LHD1-Elec	LHD1 - Oth	917.2	45,238.1	0	45,238.1	12,852.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LHD1-Gas	LHD1 - Gas	1,600.7	53,655.8	53,655.8	0	23,848.3	0.0005	0.0008	0.0033	0.0046	0.0050	0.0008	0.0063	0.0167	0.0003	0.0006	0.0030	0.0039	0.0050	0.0008	0.0063	0.0160	0.0348	0.0067	0.0826	0.1242	0.0022	0.0001
SACOG	All Sub-Areas	2040	Annual	LHD2-Dsl	LHD2 - Dsl	535.2	17,111.8	17,111.8	0	6,732.0	0.0027	0.0001		0.0028				0.0028	0.0024	0.0001		0.0024				0.0024	0.0065	0.0005		0.0071	0.0133	0.0008
SACOG	All Sub-Areas	2040	Annual	LHD2-Elec	LHD2 - Oth	229.9	10,931.1	0	10,931.1	3,044.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LHD2-Gas	LHD2 - Gas	199.9	6,564.5	6,564.5	0	2,978.9	0.0000	0.0001	0.0004	0.0005	0.0007	0.0001	0.0008	0.0021	0.0000	0.0001	0.0003	0.0004	0.0007	0.0001	0.0008	0.0020	0.0044	0.0008	0.0106	0.0158	0.0002	0.0000
SACOG	All Sub-Areas	2040	Annual	MCY-Gas	MCY - Gas	3,373.8	17,235.4	17,235.4	0	6,747.7	0.0216		0.0090	0.0306	0.0180	0.0267	0.0298	0.1051	0.0175		0.0082	0.0257	0.0180	0.0267	0.0298	0.1002	0.2135		0.0602	0.2738	0.0096	
SACOG	All Sub-Areas	2040	Annual	MDV-Dsl	MDV - Dsl	248.7	8,167.1	8,167.1	0	1,105.0	0.0001			0.0001				0.0001	0.0001			0.0001				0.0001	0.0017			0.0017	0.0001	
SACOG	All Sub-Areas	2040	Annual	MDV-Elec	MDV - Oth	1,027.4	29,928.4	0	29,928.4	4,883.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	MDV-Gas	MDV - Gas	19,793.6	690,912.8	690,912.8	0	89,421.7	0.0062		0.0245	0.0307	0.0341	0.0062	0.0242	0.0953	0.0042		0.0224	0.0266	0.0341	0.0062	0.0242	0.0913	0.5135		0.2377	0.7512	0.0243	
SACOG	All Sub-Areas	2040	Annual	MDV-Phe	MDV - Gas	500.9	19,268.5	7,916.2	11,352.3	2,071.1	0.0000		0.0004	0.0005	0.0004	0.0001	0.0002	0.0011	0.0000		0.0004	0.0004	0.0004	0.0001	0.0002	0.0010	0.0042		0.0030	0.0072	0.0001	
SACOG	All Sub-Areas	2040	Annual	MH-Dsl	MH - Dsl	123.5	1,098.0	1,098.0	0	12.4	0.0001			0.0001				0.0001	0.0001			0.0001				0.0001	0.0004			0.0004	0.0037	
SACOG	All Sub-Areas	2040	Annual	MH-Gas	MH - Gas	186.0	1,888.2	1,888.2	0	18.6	0.0000		0.0000	0.0000	0.0006	0.0001	0.0000	0.0007	0.0000		0.0000	0.0000	0.0006	0.0001	0.0000	0.0007	0.0004		0.0001	0.0004	0.0002	
SACOG	All Sub-Areas	2040	Annual	Motor Coach-Dsl	Motor Coach - Dsl	11.5	1,440.5	1,440.5	0	263.6	0.0000	0.0001		0.0001				0.0001	0.0000	0.0001		0.0001				0.0001	0.0001	0.0007		0.0008	0.0016	0.0003
SACOG	All Sub-Areas	2040	Annual	OBUS-Elec	OBUS - Oth	8.47	607.6	0	607.6	169.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	OBUS-Gas	OBUS - Gas	30.4	865.5	865.5	0	608.9	0.0001	0.0000	0.0001	0.0002	0.0002	0.0000	0.0002	0.0006	0.0000	0.0000	0.0001	0.0002	0.0002	0.0000	0.0002	0.0005	0.0009	0.0002	0.0025	0.0035	0.0003	0.0000
SACOG	All Sub-Areas	2040	Annual	PTO-Dsl	PTO-Dsl	0	2,604.8	2,604.8	0		0.0001			0.0001				0.0001	0.0000			0.0000				0.0000	0.0005			0.0005	0.0076	
SACOG	All Sub-Areas	2040	Annual	PTO-Elec	PTO-Oth	0	1,725.2	0	1,725.2					0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	SBUS-Dsl	SBUS - Dsl	91.3	1,905.5	1,905.5	0	1,322.4	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0002	0.0007		0.0008	0.0017	0.0011
SACOG	All Sub-Areas	2040	Annual	SBUS-Elec	SBUS - Oth	5.20	1,130.8	0	1,130.8	519.7				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	SBUS-Gas	SBUS - Gas	15.6	816.8	816.8	0	62.6	0.0000	0.0003	0.0000	0.0003	0.0001	0.0000	0.0000	0.0004	0.0000	0.0002	0.0000	0.0002	0.0001	0.0000	0.0000	0.0003	0.0002	0.0014	0.0006	0.0022	0.0001	0.0000
SACOG	All Sub-Areas	2040	Annual	SBUS-NG	SBUS-Oth	2.60	56.0	56.0	0	37.6	0.0001	0.0000		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0004	0.0001		0.0005	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 4-Dsl	T6 CAIRP small-Dsl	0.9553	68.6	68.6	0	22.0	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 4-Elec	T6 CAIRP small-Oth	0.9256	76.1	0	76.1	21.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 5-Dsl	T6 CAIRP small-Dsl	1.18	94.5	94.5	0	27.1	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 5-Elec	T6 CAIRP small-Oth	1.13	104.0	0	104.0	26.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 6-Dsl	T6 CAIRP small-Dsl	5.26	243.8	243.8	0	120.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 6-Elec	T6 CAIRP small-Oth	5.21	274.8	0	274.8	119.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 7-Dsl	T6 CAIRP heavy-Dsl	12.0	2,516.5	2,516.5	0	276.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0006	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 7-Elec	T6 CAIRP heavy-Oth	3.33	736.7	0	736.7	76.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-Dsl	T6 instate small-Dsl	72.6	2,384.2	2,384.2	0	1,035.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0006		0.0007	0.0011	0.0008
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-Elec	T6 instate small-Oth	51.6	1,913.2	0	1,913.2	736.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-NG	T6 instate small-NG	0.0238	0.7922	0.7922	0	0.3396	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-Dsl	T6 instate small-Dsl	35.5	1,162.7	1,162.7	0	506.1	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0003		0.0003	0.0005	0.0004
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-Elec	T6 instate small-Oth	25.0	924.9	0	924.9	356.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-NG	T6 instate small-NG	0.0389	1.30	1.30	0	0.5545	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-Dsl	T6 instate small-Dsl	153.1	5,021.0	5,021.0	0	2,185.1	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0012		0.0015	0.0022	0.0016
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-Elec	T6 instate small-Oth	107.7	3,985.2	0	3,985.2	1,536.9				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-NG	T6 instate small-NG	0.1947	6.55	6.55	0	2.78	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-Dsl	T6 instate heavy-Dsl	32.6	1,629.9	1,629.9	0	465.3	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0003		0.0004	0.0012	0.0003
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-Elec	T6 instate heavy-Oth	13.2	707.2	0	707.2	188.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-NG	T6 instate heavy-NG	0.2666	13.2	13.2	0	3.80	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-Dsl	T6 instate small-Dsl	127.8	4,985.0	4,985.0	0	1,477.0	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0002	0.0011		0.0013	0.0017	0.0015
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-Elec	T6 instate small-Oth	90.3	4,158.0	0	4,158.0	1,043.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-NG	T6 instate small-NG	0.0651	2.67	2.67	0	0.7521	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-Dsl	T6 instate small-Dsl	349.2	13,585.3	13,585.3	0	4,036.5	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001		0.0002				0.0002	0.0006	0.0029		0.0036	0.0043	0.0040
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-Elec	T6 instate small-Oth	245.0	11,333.1	0	11,333.1	2,832.7				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-NG	T6 instate small-NG	0.2026	8.37	8.37	0	2.34	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-Dsl	T6 instate small-Dsl	232.3	9,045.7	9,045.7	0	2,685.4	0.0001	0.0001		0.0001				0.0001	0.0001	0.0000		0.0001				0.0001	0.0004	0.0019		0.0024	0.0030	0.0027
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-Elec	T6 instate small-Oth	163.1	7,519.6	0	7,519.6	1,885.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-NG	T6 instate small-NG	0.1997	8.36	8.36	0	2.31	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-Dsl	T6 instate heavy-Dsl	146.2	5,725.0	5,725.0	0	1,690.4	0.0001	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0012		0.0016	0.0032	0.0017
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-Elec	T6 instate heavy-Oth	56.0	3,395.8	0	3,395.8	647.6				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-NG	T6 instate heavy-NG	1.11	42.1	42.1	0	12.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0002	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-Dsl	T6 instate small-Dsl	1.86	83.8	83.8	0	21.5	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-Elec	T6 instate small-Oth	1.27	74.2	0	74.2	14.7				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-NG	T6 instate small-NG	0.0036	0.1659	0.1659	0	0.0416	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-Dsl	T6 instate heavy-Dsl	111.0	6,335.5	6,335.5	0	1,283.2	0.0001	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0004	0.0009		0.0013	0.0031	0.0013
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-Elec	T6 instate heavy-Oth	17.0	1,283.8	0	1,283.8	196.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-NG	T6 instate heavy-NG	0.9399	52.1	52.1	0	10.9	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000				0.0000	0.0002	0.0000		0.0002	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 4-Dsl	T6 OOS small-Dsl	0.9882	74.9	74.9	0	22.7	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 5-Dsl	T6 OOS small-Dsl	1.22	102.7	102.7	0	28.0	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 6-Dsl	T6 OOS small-Dsl	5.47	268.5	268.5	0	125.7	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 7-Dsl	T6 OOS heavy-Dsl	6.82	1,952.2	1,952.2	0	156.6	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0005	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-Dsl	T6 Public-Dsl	34.4	1,182.2	1,182.2	0	176.6	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0004		0.0005	0.0013	0.0008
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-Elec	T6 Public-Oth	17.8	733.5	0	733.5	91.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-NG	T6 Public-NG	3.36	117.8	117.8	0	17.3	0.0001	0.0001		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0004	0.0002		0.0006	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-Dsl	T6 Public-Dsl	51.8	1,776.5	1,776.5	0	265.8	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000				0.0000	0.0001	0.0006		0.0007	0.0013	0.0010
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-Elec	T6 Public-Oth	26.5	1,090.1	0	1,090.1	135.9				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-NG	T6 Public-NG	5.00	171.3	171.3	0	25.7	0.0002	0.0001		0.0003				0.0003	0.0000	0.0000		0.0000				0.0000	0.0006	0.0003		0.0009	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-Dsl	T6 Public-Dsl	51.4	1,773.5	1,773.5	0	263.7	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000				0.0000	0.0001	0.0006		0.0007	0.0015	0.0010
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-Elec	T6 Public-Oth	27.1	1,108.8	0	1,108.8	139.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-NG	T6 Public-NG	5.63	194.9	194.9	0	28.9	0.0002	0.0001		0.0003				0.0003	0.0000	0.0000		0.0000				0.0000	0.0007	0.0003		0.0010	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-Dsl	T6 Public-Dsl	188.9	7,824.7	7,824.7	0	969.2	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001		0.0002				0.0002	0.0005	0.0022		0.0027	0.0069	0.0036
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-Elec	T6 Public-Oth	84.0	4,354.0	0	4,354.0	430.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-NG	T6 Public-NG	20.2	841.7	841.7	0	103.5	0.0008	0.0004		0.0012				0.0012	0.0000	0.0000		0.0000				0.0000	0.0028	0.0013		0.0041	0.0001	0.0002
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-Dsl	T6 Utility-Dsl	3.26	128.2	128.2	0	41.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-Elec	T6 Utility-Oth	3.32	139.4	0	139.4	42.6				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-NG	T6 Utility-NG	0.0052	0.2037	0.2037	0	0.0663	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-Dsl	T6 Utility-Dsl	0.6168	24.2	24.2	0	7.90	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-Elec	T6 Utility-Oth	0.6281	26.3	0	26.3	8.04				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-NG	T6 Utility-NG	0.0010	0.0386	0.0386	0	0.0126	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-Dsl	T6 Utility-Dsl	0.6825	32.5	32.5	0	8.74	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-Elec	T6 Utility-Oth	0.6995	37.8	0	37.8	8.95				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-NG	T6 Utility-NG	0.0011	0.0518	0.0518	0	0.0139	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6TS-Elec	T6TS - Gas	47.1	3,339.1	0	3,339.1	942.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6TS-Gas	T6TS - Gas	104.3	4,494.3	4,494.3	0	2,087.3	0.0001	0.0002	0.0005	0.0008	0.0003	0.0000	0.0006	0.0017	0.0001	0.0001	0.0004	0.0006	0.0003	0.0000	0.0006	0.0016	0.0013	0.0018	0.0084	0.0115	0.0005	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-Dsl	T7 CAIRP-Dsl	163.3	34,449.3	34,449.3	0	3,752.2	0.0005	0.0021		0.0026				0.0026	0.0004	0.0019		0.0023				0.0023	0.0015	0.0277		0.0292	0.0460	0.0222
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-Elec	T7 CAIRP-Oth	43.0	9,515.8	0	9,515.8	988.6				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-NG	T7 CAIRP-NG	1.06	222.6	222.6	0	24.3	0.0002	0.0002		0.0004				0.0004	0.0000	0.0000		0.0000				0.0000	0.0007	0.0006		0.0013	0.0000	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 NNOOS Class 8-Dsl	T7 NNOOS-Dsl	175.6	51,477.9	51,477.9	0	4,035.9	0.0007	0.0029		0.0036				0.0036	0.0006	0.0025		0.0031				0.0031	0.0021	0.0370		0.0392	0.0754	0.0296
SACOG	All Sub-Areas	2040	Annual	T7 NOOS Class 8-Dsl	T7 NOOS-Dsl	75.8	18,716.5	18,716.5	0	1,742.5	0.0003	0.0012		0.0015				0.0015	0.0002	0.0011		0.0013				0.0013	0.0008	0.0160		0.0168	0.0282	0.0128
SACOG	All Sub-Areas	2040	Annual	T7 Other Port Class 8-Dsl	T7 Other Port-Dsl	1.31	329.8	329.8	0	21.5	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0004	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 Other Port Class 8-Elec	T7 Other Port-Oth	0.2720	78.0	0	78.0	4.45				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 POAK Class 8-Dsl	T7 POAK-Dsl	5.79	673.7	673.7	0	94.7	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0003		0.0004	0.0010	0.0003
SACOG	All Sub-Areas	2040	Annual	T7 POAK Class 8-Elec	T7 POAK-Oth	1.15	132.0	0	132.0	18.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 POLA Class 8-Dsl	T7 POLA-Dsl	0.0000	0.0001	0.0001	0	0.0000	0	0		0				0	0	0		0				0	0	0		0	0	0
SACOG	All Sub-Areas	2040	Annual	T7 POLA Class 8-Elec	T7 POLA-Oth	0.0000	0.0000	0	0.0000	0.0000				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-Dsl	T7 Public-Dsl	340.9	13,640.6	13,640.6	0	1,749.1	0.0007	0.0005		0.0012				0.0012	0.0006	0.0004		0.0010				0.0010	0.0026	0.0061		0.0087	0.0405	0.0071
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-Elec	T7 Public-Oth	126.8	6,538.4	0	6,538.4	650.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-NG	T7 Public-NG	7.70	311.3	311.3	0	39.5	0.0006	0.0002		0.0008				0.0008	0.0000	0.0000		0.0000				0.0000	0.0029	0.0004		0.0033	0.0001	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-Dsl	T7 SWCV-Dsl	17.1	1,107.0	1,107.0	0	78.5	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0001	0.0003		0.0004	0.0050	0.0006
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-Elec	T7 SWCV-Oth	33.7	2,181.2	0	2,181.2	155.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-NG	T7 SWCV-NG	60.7	3,932.1	3,932.1	0	279.0	0.0043	0.0003		0.0046				0.0046	0.0001	0.0000		0.0001				0.0001	0.0504	0.0027		0.0531	0.0021	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single-Dsl	10.5	669.4	669.4	0	99.0	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0003		0.0004	0.0006	0.0003
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-Elec	Single Concrete/Transit Mix	9.56	713.4	0	713.4	90.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-NG	T7 Single-NG	0.2920	18.7	18.7	0	2.75	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-Dsl	T7 Single-Dsl	59.7	2,894.5	2,894.5	0	562.5	0.0000	0.0001		0.0002				0.0002	0.0000	0.0001		0.0002				0.0002	0.0002	0.0018		0.0020	0.0038	0.0015
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-Elec	T7 Single Dump-Oth	23.9	1,674.9	0	1,674.9	225.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-NG	T7 Single-NG	1.79	85.4	85.4	0	16.8	0.0001	0.0001		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0005	0.0001		0.0006	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-Dsl	T7 Single-Dsl	211.7	9,175.1	9,175.1	0	1,994.5	0.0001	0.0005		0.0006				0.0006	0.0001	0.0004		0.0005				0.0005	0.0005	0.0064		0.0070	0.0107	0.0051
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-Elec	T7 Single Other-Oth	103.2	6,300.4	0	6,300.4	971.7				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-NG	T7 Single-NG	6.32	275.1	275.1	0	59.5	0.0003	0.0002		0.0005				0.0005	0.0000	0.0000		0.0000				0.0000	0.0014	0.0006		0.0020	0.0001	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-Dsl	T7 Tractor-Dsl	227.9	14,871.2	14,871.2	0	3,312.1	0.0002	0.0010		0.0012				0.0012	0.0002	0.0009		0.0010				0.0010	0.0008	0.0128		0.0136	0.0199	0.0103
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-Elec	T7 Tractor-Oth	32.8	2,487.4	0	2,487.4	476.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-NG	T7 Tractor-NG	3.35	210.7	210.7	0	48.7	0.0002	0.0002		0.0004				0.0004	0.0000	0.0000		0.0000				0.0000	0.0009	0.0006		0.0015	0.0000	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 Utility Class 8-Dsl	T7 Utility-Dsl	3.34	136.6	136.6	0	42.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0001	0.0002	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 Utility Class 8-Elec	T7 Utility-Oth	1.45	74.9	0	74.9	18.6				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7IS-Elec	T7IS - Gas	0.0572	10.4	0	10.4	1.14				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7IS-Gas	T7IS - Gas	0.1205	14.2	14.2	0	2.41	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005		0.0000	0.0005	0.0000	
SACOG	All Sub-Areas	2040	Annual	UBUS-Dsl	UBUS - Dsl	1.79	179.5	179.5	0	7.15	0.0000			0.0000				0.0000	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000	
SACOG	All Sub-Areas	2040	Annual	UBUS-Elec	UBUS - Oth	75.9	6,877.8	0	6,877.8	303.5				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	UBUS-Gas	UBUS - Gas	1.14	72.2	72.2	0	4.54	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	
SACOG	All Sub-Areas	2040	Annual	UBUS-NG	UBUS - NG	8.27	816.1	816.1	0	33.1	0.0039			0.0039				0.0039	0.0001			0.0001				0.0001	0.0458			0.0458	0.0001	

EMFAC2021 Connector Congested VMT

NOx_STREX	NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
0.2188	0.7896	1,766.8	19.8	39.0	1,825.7	0.0095	0.0001	0.0007	0.0103	0.0538	0.0807	0.1448	0.0090	0.0001	0.0006	0.0097	0.0135	0.0282	0.0514	0.0174	0.0002	0.0004	0.0180	154.7	33.2	1.35
0.0005	0.0044	3.37	0.0349		3.41	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3065	
	0.0001	0.3898	0.0092		0.3989	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0491
	0.0001	0.3114			0.3114	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0280	
	0				0				0	0.0027	0.0015	0.0042				0	0.0007	0.0005	0.0012				0			
0.0529	0.1043	583.4		15.9	599.3	0.0015		0.0003	0.0018	0.0194	0.0197	0.0408	0.0013		0.0003	0.0016	0.0048	0.0069	0.0133	0.0058		0.0002	0.0060	64.1		
0.0014	0.0017	13.8		0.6736	14.5	0.0000		0.0000	0.0000	0.0009	0.0005	0.0014	0.0000		0.0000	0.0000	0.0002	0.0002	0.0004	0.0001		0.0000	0.0001	1.55		
	0.0000	0.0006			0.0006	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0001	
	0				0				0	0.0000	0.0000	0.0001				0	0.0000	0.0000	0.0000				0			
0.0044	0.0089	45.1		1.34	46.4	0.0001		0.0000	0.0001	0.0013	0.0016	0.0030	0.0001		0.0000	0.0001	0.0003	0.0006	0.0010	0.0005		0.0000	0.0005	4.97		
0.0000	0.0000	0.3872		0.0205	0.4078	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0436		
	0.0002	1.43			1.43	0.0000			0.0000	0.0000	0.0001	0.0001	0.0000			0.0000	0.0000	0.0000	0.0001	0.0000			0.0000		0.1285	
	0				0				0	0.0003	0.0002	0.0005				0	0.0001	0.0001	0.0001				0			
0.0379	0.0736	413.2		11.6	424.8	0.0009		0.0002	0.0011	0.0112	0.0136	0.0258	0.0008		0.0002	0.0010	0.0028	0.0047	0.0085	0.0041		0.0001	0.0043	45.5		
0.0004	0.0005	4.28		0.2573	4.54	0.0000		0.0000	0.0000	0.0003	0.0001	0.0004	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0000	0.0000	0.4855		
	0.0280	24.9	0.1528		25.0	0.0011	0.0000		0.0011	0.0005	0.0032	0.0048	0.0010	0.0000		0.0011	0.0001	0.0011	0.0023	0.0002	0.0000		0.0002		2.25	
	0				0				0	0.0004	0.0019	0.0023				0	0.0001	0.0007	0.0008				0			
0.0128	0.0151	45.4	0.1813	0.4989	46.1	0.0001		0.0000	0.0001	0.0005	0.0046	0.0052	0.0001		0.0000	0.0001	0.0001	0.0016	0.0018	0.0005	0.0000	0.0000	0.0005	4.93		
	0.0141	13.4	0.1154		13.5	0.0005	0.0000		0.0005	0.0002	0.0017	0.0025	0.0005	0.0000		0.0005	0.0001	0.0006	0.0012	0.0001	0.0000		0.0001		1.22	
	0				0				0	0.0001	0.0005	0.0006				0	0.0000	0.0002	0.0002				0			
0.0015	0.0017	6.24	0.0264	0.0600	6.33	0.0000		0.0000	0.0000	0.0001	0.0007	0.0007	0.0000		0.0000	0.0000	0.0000	0.0002	0.0003	0.0001	0.0000	0.0000	0.0001	0.6763		
0.0007	0.0104	3.17		0.1887	3.36	0.0000		0.0000	0.0001	0.0001	0.0002	0.0004	0.0000		0.0000	0.0001	0.0000	0.0001	0.0002	0.0000		0.0000	0.0000	0.4131		
	0.0001	3.22			3.22	0.0000			0.0000	0.0001	0.0001	0.0002	0.0000			0.0000	0.0000	0.0000	0.0001	0.0000			0.0000		0.2894	
	0				0				0	0.0003	0.0001	0.0004				0	0.0001	0.0001	0.0001				0			
0.0252	0.0495	274.3		8.22	282.5	0.0005		0.0001	0.0006	0.0061	0.0075	0.0142	0.0005		0.0001	0.0006	0.0015	0.0026	0.0047	0.0027		0.0001	0.0028	30.2		
0.0003	0.0003	2.53		0.1930	2.73	0.0000		0.0000	0.0000	0.0002	0.0001	0.0003	0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0000		0.0000	0.0000	0.2916		
	0.0037	1.31			1.31	0.0001			0.0001	0.0000	0.0001	0.0001	0.0001			0.0001	0.0000	0.0000	0.0001	0.0000			0.0000		0.1176	
0.0000	0.0003	4.01		0.0005	4.01	0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.4271		
0.0004	0.0023	2.45	0.1085		2.56	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2304	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0003	0.0005	1.51	0.0117	0.0157	1.54	0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1647		
	0.0076	5.10			5.10	0.0000			0.0000			0.0000	0.0000			0.0000			0.0000	0.0000			0.0000		0.4589	
	0				0				0			0				0			0				0			
0.0009	0.0038	2.22	0.1975		2.42	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2175	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0001	0.0002	0.6754	0.0386	0.0026	0.7166	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0768		
	0.0000	0.0626	0.0121		0.0747	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0092
0.0000	0.0000	0.0770	0.0005		0.0776	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0070	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0000	0.0000	0.1062	0.0007		0.1069	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0096	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0000	0.0001	0.2731	0.0030		0.2760	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0248	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0001	0.0007	2.49	0.0067		2.49	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2245	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0013	0.0031	2.78	0.1433		2.93	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2634	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0008	0.0001		0.0009	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0001
0.0006	0.0015	1.36	0.0700		1.43	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1286	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0014	0.0002		0.0015	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0002
0.0027	0.0066	5.87	0.3026		6.17	0.0000	0.0000		0.0000	0.0001	0.0003	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5556	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0068	0.0009		0.0077	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0009
0.0007	0.0023	1.96	0.0679		2.03	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1823	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0142	0.0011		0.0153	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0019
0.0021	0.0052	5.62	0.2714		5.89	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5301	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0024	0.0003		0.0027	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0003
0.0057	0.0140	15.3	0.7412		16.1	0.0000	0.0000		0.0000	0.0002	0.0007	0.0009	0.0000	0.0000		0.0000	0.0000	0.0002	0.0003	0.0001	0.0000		0.0002		1.45	
	0				0				0	0.0001	0.0003	0.0004				0	0.0000	0.0001	0.0001				0			
	0.0000	0.0076	0.0010		0.0086	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0011
0.0038	0.0094	10.2	0.4933		10.7	0.0000	0.0000		0.0000	0.0001	0.0004	0.0006	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002	0.0001	0.0000		0.0001		0.9631	
	0				0				0	0.0001	0.0002	0.0003				0	0.0000	0.0001	0.0001				0			
	0.0000	0.0076	0.0009		0.0085	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0011
0.0029	0.0078	6.51	0.3275		6.84	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.6158	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0389	0.0051		0.0440	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0054
0.0000	0.0001	0.0946	0.0040		0.0986	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0089	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0002	0.0000		0.0002	0.0000	0		0.0000	0.0000	0.0000	0.0000	0.0000	0		0.0000	0.0000	0.0000	0.0000				0			0.0000
0.0021	0.0065	6.64	0.2428		6.89	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.6199	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0476	0.0043		0.0519	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0064
0.0000	0.0000	0.0785	0.0005		0.0790	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0071	
0.0000	0.0000	0.1078	0.0007		0.1084	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0098	
0.0001	0.0002	0.2803	0.0029		0.2832	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0255	
0.0001	0.0006	1.85	0.0036		1.85	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.1664	
0.0003	0.0023	1.45	0.1097		1.56	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1401	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.1199	0.0230		0.1429	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0176
0.0004	0.0027	2.18	0.1654		2.34	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.2108	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0001	0.1762	0.0338		0.2100	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0258
0.0004	0.0029	2.15	0.1613		2.31	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.2079	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0001	0.1994	0.0388		0.2382	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0293
0.0015	0.0121	9.35	0.5835		9.93	0.0000	0.0000		0.0000	0.0001	0.0004	0.0005	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.8941	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0001				0			
	0.0002	0.8578	0.1387		0.9965	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.1226
0.0000	0.0001	0.1441	0.0051		0.1492	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0134	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0002	0.0000		0.0002	0.0000	0		0.0000	0.0000	0.0000	0.0000	0.0000	0		0.0000	0.0000	0.0000	0.0000				0			0.0000
0.0000	0.0000	0.0272	0.0010		0.0282	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0025	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0000	0.0000		0.0000	0	0		0	0.0000	0.0000	0.0000	0	0		0	0.0000	0.0000	0.0000				0			0.0000
0.0000	0.0000	0.0365	0.0011		0.0376	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0034	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0000	0.0000		0.0001	0	0		0.0000	0.0000	0.0000	0.0000	0	0		0.0000	0.0000	0.0000	0.0000				0			0.0000
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
0.0008	0.0013	7.80	0.0522	0.0749	7.93	0.0000		0.0000	0.0000	0.0001	0.0002	0.0003	0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0000	0.0000	0.0001	0.8461		
0.0066	0.0747	48.4	3.61		52.0	0.0011	0.0000		0.0011	0.0014	0.0031	0.0056	0.0011	0.0000		0.0011	0.0003	0.0011	0.0025	0.0005	0.0000		0.0005		4.68	
	0				0				0	0.0004	0.0004	0.0008				0	0.0001	0.0002	0.0002				0			
	0.0001	0.2366	0.0529		0.2894	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0356
0.0106	0.1156	69.3	4.61		73.9	0.0017	0.0000		0.0017	0.0020	0.0046	0.0083	0.0016	0.0000		0.0016	0.0005	0.0016	0.0037	0.0007	0.0000		0.0007		6.65	
0.0046	0.0455	25.2	1.99		27.2	0.0006	0.0000		0.0006	0.0007	0.0017	0.0031	0.0006	0.0000		0.0006	0.0002	0.0006	0.0014	0.0002	0.0000		0.0003		2.44	
0.0000	0.0006	0.4963	0.0094		0.5057	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0455	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0002	0.0014	1.01	0.0415		1.05	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0948	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0	0.0000	0.0000	0.0000		0.0000	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0		0.0000	
	0				0				0	0	0	0				0	0	0	0				0			
0.0101	0.0577	24.8	1.01		25.8	0.0002	0.0000		0.0002	0.0005	0.0016	0.0023	0.0002	0.0000		0.0002	0.0001	0.0006	0.0009	0.0002	0.0000		0.0002		2.32	
	0				0				0	0.0003	0.0004	0.0007				0	0.0001	0.0001	0.0002				0			
	0.0002	0.4761	0.0461		0.5222	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0642
0.0003	0.0059	4.31	0.0610		4.37	0.0000	0.0000		0.0000	0.0000	0.0003	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3932	
	0				0				0	0.0001	0.0003	0.0003				0	0.0000	0.0001	0.0001				0			
	0.0022	5.58	0.4025		5.98	0.0000	0.0000		0.0000	0.0002	0.0009	0.0011	0.0000	0.0000		0.0000	0.0000	0.0003	0.0004				0			0.7355
0.0003	0.0011	1.07	0.0430		1.12	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1004	
	0				0				0	0.0000	0.0000	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0218	0.0027		0.0245	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0030
0.0017	0.0070	4.84	0.2672		5.11	0.0001	0.0000		0.0001	0.0001	0.0003	0.0004	0.0001	0.0000		0.0001	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000		0.4596	
	0				0				0	0.0001	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.1044	0.0167		0.1212	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0149
0.0061	0.0220	15.1	0.9121		16.0	0.0002	0.0000		0.0002	0.0004	0.0009	0.0014	0.0002	0.0000		0.0002	0.0001	0.0003	0.0006	0.0001	0.0000		0.0002		1.44	
	0				0				0	0.0003	0.0003	0.0006				0	0.0001	0.0001	0.0002				0			
	0.0001	0.3276	0.0582		0.3859	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0475
0.0128	0.0429	21.3	1.72		23.0	0.0004	0.0000		0.0004	0.0006	0.0014	0.0023	0.0003	0.0000		0.0004	0.0001	0.0005	0.0010	0.0002	0.0000		0.0002		2.07	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0001				0			
	0.0001	0.2385	0.0559		0.2944	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0362
0.0002	0.0004	0.2356	0.0050		0.2406	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0217	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0000	0.0000	0.0276		0.0001	0.0277	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0030		
	0.0000	0.1894			0.1894	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0170	
	0				0				0	0.0002	0.0004	0.0006				0	0.0000	0.0001	0.0002				0			
0.0000	0.0000	0.0702		0.0001	0.0703	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0075		
	0.0001	1.13			1.13	0.0000			0.0000	0.0000	0.0001	0.0001	0.0000			0.0000	0.0000	0.0000	0.0000				0			0.1388

EMFAC2021 Connector Daily VMT

Area	Sub-Area	Cal. Year	Season	Veh_Tech	EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS	TOG_TOTAL	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS	ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX	NOx_IDLEX
SACOG	All Sub-Areas	2040	Annual	All Vehicles	All Vehicles	1,975,023.3	74,555,224.2	66,162,447.6	8,392,776.6	10,018,325.0	1.03	0.1861	1.81	3.02	2.69	0.8313	2.20	8.75	0.6879	0.1389	1.65	2.48	2.69	0.8313	2.20	8.20	44.8	2.19	19.5	66.4	6.67	1.75
SACOG	All Sub-Areas	2040	Annual	All Other Buses-Dsl	All Other Buses - Dsl	772.8	39,414.7	39,414.7	0	6,877.6	0.0030	0.0001		0.0031				0.0031	0.0027	0.0001		0.0027				0.0027	0.0089	0.0018		0.0107	0.0487	0.0019
SACOG	All Sub-Areas	2040	Annual	All Other Buses-NG	All Other Buses - Oth	92.9	4,854.3	4,854.3	0	827.2	0.0045	0.0004		0.0049				0.0049	0.0001	0.0000		0.0001				0.0001	0.0179	0.0009		0.0188	0.0007	0.0002
SACOG	All Sub-Areas	2040	Annual	LDA-Dsl	LDA - Dsl	669.2	19,972.4	19,972.4	0	2,834.7	0.0002			0.0002				0.0002	0.0002			0.0002				0.0002	0.0043			0.0043	0.0011	
SACOG	All Sub-Areas	2040	Annual	LDA-Elec	LDA - Oth	100,052.2	4,158,953.8	0	4,158,953.8	473,054.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LDA-Gas	LDA - Gas	781,794.3	30,018,190.5	30,018,190.5	0	3,610,217.1	0.1632		0.6535	0.8167	0.9748	0.1893	0.6951	2.68	0.1118		0.5969	0.7087	0.9748	0.1893	0.6951	2.57	17.8		7.29	25.1	0.7023	
SACOG	All Sub-Areas	2040	Annual	LDA-Phe	LDA - Gas	35,767.5	1,429,958.3	590,249.6	839,708.7	147,898.5	0.0030		0.0308	0.0338	0.0325	0.0066	0.0134	0.0863	0.0021		0.0281	0.0301	0.0325	0.0066	0.0134	0.0827	0.3116		0.2164	0.5280	0.0045	
SACOG	All Sub-Areas	2040	Annual	LDT1-Dsl	LDT1 - Dsl	0.6302	22.7	22.7	0	2.81	0.0000			0.0000				0.0000	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000	
SACOG	All Sub-Areas	2040	Annual	LDT1-Elec	LDT1 - Oth	1,288.3	55,395.6	0	55,395.6	6,156.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LDT1-Gas	LDT1 - Gas	59,877.0	2,040,208.5	2,040,208.5	0	264,259.6	0.0159		0.0629	0.0788	0.1356	0.0243	0.0942	0.3329	0.0109		0.0574	0.0683	0.1356	0.0243	0.0942	0.3224	1.40		0.6297	2.03	0.0626	
SACOG	All Sub-Areas	2040	Annual	LDT1-Phe	LDT1 - Gas	985.3	41,779.2	17,036.7	24,742.5	4,074.2	0.0001		0.0008	0.0009	0.0005	0.0001	0.0002	0.0017	0.0001		0.0008	0.0008	0.0005	0.0001	0.0002	0.0016	0.0090		0.0060	0.0150	0.0001	
SACOG	All Sub-Areas	2040	Annual	LDT2-Dsl	LDT2 - Dsl	1,793.3	67,897.2	67,897.2	0	8,260.8	0.0013			0.0013				0.0013	0.0011			0.0011				0.0011	0.0118			0.0118	0.0023	
SACOG	All Sub-Areas	2040	Annual	LDT2-Elec	LDT2 - Oth	15,831.7	466,377.7	0	466,377.7	75,497.9				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LDT2-Gas	LDT2 - Gas	477,607.8	17,837,412.0	17,837,412.0	0	2,185,288.4	0.1336		0.5046	0.6382	0.6950	0.1274	0.5068	1.97	0.0916		0.4609	0.5524	0.6950	0.1274	0.5068	1.88	12.4		5.49	17.9	0.5047	
SACOG	All Sub-Areas	2040	Annual	LDT2-Phe	LDT2 - Gas	11,416.9	459,780.8	188,708.9	271,071.9	47,209.0	0.0010		0.0098	0.0108	0.0079	0.0017	0.0030	0.0234	0.0007		0.0090	0.0096	0.0079	0.0017	0.0030	0.0223	0.0997		0.0692	0.1689	0.0014	
SACOG	All Sub-Areas	2040	Annual	LHD1-Dsl	LHD1 - Dsl	16,774.9	536,630.7	536,630.7	0	211,007.5	0.0798	0.0023		0.0821				0.0821	0.0701	0.0020		0.0722				0.0722	0.1937	0.0168		0.2105	0.4067	0.0265
SACOG	All Sub-Areas	2040	Annual	LHD1-Elec	LHD1 - Oth	12,952.8	638,839.5	0	638,839.5	181,649.5				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LHD1-Gas	LHD1 - Gas	23,034.9	769,245.6	769,245.6	0	343,186.1	0.0066	0.0122	0.0473	0.0661	0.0717	0.0118	0.0914	0.2410	0.0045	0.0083	0.0432	0.0561	0.0717	0.0118	0.0914	0.2310	0.4990	0.0960	1.19	1.78	0.0327	0.0007
SACOG	All Sub-Areas	2040	Annual	LHD2-Dsl	LHD2 - Dsl	7,814.1	246,711.6	246,711.6	0	98,291.8	0.0397	0.0011		0.0407				0.0407	0.0348	0.0009		0.0358				0.0358	0.0964	0.0078		0.1042	0.2020	0.0123
SACOG	All Sub-Areas	2040	Annual	LHD2-Elec	LHD2 - Oth	3,205.4	152,774.4	0	152,774.4	42,446.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LHD2-Gas	LHD2 - Gas	2,741.1	90,624.2	90,624.2	0	40,837.9	0.0007	0.0013	0.0048	0.0068	0.0089	0.0014	0.0114	0.0284	0.0005	0.0009	0.0044	0.0057	0.0089	0.0014	0.0114	0.0274	0.0602	0.0114	0.1462	0.2179	0.0033	0.0001
SACOG	All Sub-Areas	2040	Annual	MCY-Gas	MCY - Gas	47,723.9	242,134.1	242,134.1	0	95,447.9	0.3046		0.1283	0.4329	0.2577	0.3764	0.4222	1.49	0.2466		0.1179	0.3645	0.2577	0.3764	0.4222	1.42	3.01		0.8595	3.87	0.1362	
SACOG	All Sub-Areas	2040	Annual	MDV-Dsl	MDV - Dsl	3,563.9	115,910.8	115,910.8	0	15,773.3	0.0010			0.0010				0.0010	0.0009			0.0009				0.0009	0.0249			0.0249	0.0022	
SACOG	All Sub-Areas	2040	Annual	MDV-Elec	MDV - Oth	14,315.9	417,698.5	0	417,698.5	68,044.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	MDV-Gas	MDV - Gas	277,584.0	9,698,163.5	9,698,163.5	0	1,252,442.5	0.0866		0.3481	0.4347	0.4878	0.0885	0.3463	1.36	0.0594		0.3180	0.3773	0.4878	0.0885	0.3463	1.30	7.20		3.36	10.6	0.3428	
SACOG	All Sub-Areas	2040	Annual	MDV-Phe	MDV - Gas	6,988.1	270,124.7	110,990.6	159,134.1	28,895.9	0.0006		0.0060	0.0066	0.0055	0.0011	0.0022	0.0154	0.0004		0.0055	0.0059	0.0055	0.0011	0.0022	0.0147	0.0586		0.0423	0.1010	0.0009	
SACOG	All Sub-Areas	2040	Annual	MH-Dsl	MH - Dsl	1,867.2	16,157.6	16,157.6	0	186.7	0.0021			0.0021				0.0021	0.0018			0.0018				0.0018	0.0058			0.0058	0.0559	
SACOG	All Sub-Areas	2040	Annual	MH-Gas	MH - Gas	2,675.8	26,843.5	26,843.5	0	267.7	0.0005		0.0000	0.0006	0.0089	0.0015	0.0000	0.0111	0.0004		0.0000	0.0004	0.0089	0.0015	0.0000	0.0109	0.0054		0.0008	0.0062	0.0036	
SACOG	All Sub-Areas	2040	Annual	Motor Coach-Dsl	Motor Coach - Dsl	140.4	17,632.8	17,632.8	0	3,227.0	0.0002	0.0007		0.0009				0.0009	0.0002	0.0006		0.0008				0.0008	0.0007	0.0091		0.0099	0.0194	0.0037
SACOG	All Sub-Areas	2040	Annual	OBUS-Elec	OBUS - Oth	118.1	8,336.5	0	8,336.5	2,362.6				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	OBUS-Gas	OBUS - Gas	404.0	11,650.0	11,650.0	0	8,082.5	0.0007	0.0005	0.0018	0.0030	0.0020	0.0003	0.0021	0.0075	0.0005	0.0003	0.0016	0.0025	0.0020	0.0003	0.0021	0.0070	0.0111	0.0026	0.0329	0.0465	0.0036	0.0000
SACOG	All Sub-Areas	2040	Annual	PTO-Dsl	PTO-Dsl	0	36,475.9	36,475.9	0		0.0007			0.0007				0.0007	0.0006			0.0006				0.0006	0.0076			0.0076	0.1067	
SACOG	All Sub-Areas	2040	Annual	PTO-Elec	PTO-Oth	0	23,945.6	0	23,945.6					0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	SBUS-Dsl	SBUS - Dsl	1,283.7	26,838.1	26,838.1	0	18,587.5	0.0007	0.0003		0.0009				0.0009	0.0006	0.0002		0.0008				0.0008	0.0025	0.0093		0.0119	0.0244	0.0157
SACOG	All Sub-Areas	2040	Annual	SBUS-Elec	SBUS - Oth	72.8	15,723.1	0	15,723.1	7,254.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	SBUS-Gas	SBUS - Gas	210.6	10,858.8	10,858.8	0	842.2	0.0001	0.0036	0.0004	0.0041	0.0010	0.0001	0.0006	0.0059	0.0001	0.0025	0.0004	0.0029	0.0010	0.0001	0.0006	0.0047	0.0023	0.0191	0.0079	0.0293	0.0017	0.0002
SACOG	All Sub-Areas	2040	Annual	SBUS-NG	SBUS-Oth	28.1	606.1	606.1	0	407.6	0.0015	0.0004		0.0018				0.0018	0.0000	0.0000		0.0000				0.0000	0.0038	0.0012		0.0050	0.0001	0.0002
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 4-Dsl	T6 CAIRP small-Dsl	12.7	909.1	909.1	0	292.2	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0001	0.0002	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 4-Elec	T6 CAIRP small-Oth	12.3	1,006.0	0	1,006.0	282.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 5-Dsl	T6 CAIRP small-Dsl	15.7	1,252.6	1,252.6	0	361.4	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0001	0.0003	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 5-Elec	T6 CAIRP small-Oth	15.0	1,374.5	0	1,374.5	345.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 6-Dsl	T6 CAIRP small-Dsl	70.0	3,231.5	3,231.5	0	1,609.6	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0002		0.0003	0.0007	0.0002
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 6-Elec	T6 CAIRP small-Oth	69.1	3,633.2	0	3,633.2	1,589.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 7-Dsl	T6 CAIRP heavy-Dsl	160.2	33,325.1	33,325.1	0	3,680.4	0.0002	0.0000		0.0003				0.0003	0.0002	0.0000		0.0002				0.0002	0.0011	0.0004		0.0015	0.0073	0.0005
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 7-Elec	T6 CAIRP heavy-Oth	44.1	9,734.0	0	9,734.0	1,013.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-Dsl	T6 instate small-Dsl	917.6	30,102.8	30,102.8	0	13,093.9	0.0003	0.0002		0.0005				0.0005	0.0002	0.0002		0.0004				0.0004	0.0019	0.0071		0.0090	0.0136	0.0098
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-Elec	T6 instate small-Oth	649.0	24,022.9	0	24,022.9	9,260.7				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-NG	T6 instate small-NG	0.4607	15.3	15.3	0	6.57	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-Dsl	T6 instate small-Dsl	455.4	14,901.8	14,901.8	0	6,499.0	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001		0.0002				0.0002	0.0009	0.0035		0.0045	0.0066	0.0048
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-Elec	T6 instate small-Oth	318.0	11,757.4	0	11,757.4	4,538.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-NG	T6 instate small-NG	0.7520	25.1	25.1	0	10.7	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-Dsl	T6 instate small-Dsl	2,006.6	65,672.7	65,672.7	0	28,633.7	0.0005	0.0004		0.0010				0.0010	0.0005	0.0004		0.0008				0.0008	0.0040	0.0156		0.0196	0.0291	0.0213
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-Elec	T6 instate small-Oth	1,398.4	51,667.5	0	51,667.5	19,955.6				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-NG	T6 instate small-NG	3.77	126.8	126.8	0	53.8	0.0001	0.0000		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0005	0.0002		0.0007	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-Dsl	T6 instate heavy-Dsl	470.8	23,473.1	23,473.1	0	6,718.9	0.0003	0.0001		0.0004				0.0004	0.0002	0.0001		0.0003				0.0003	0.0019	0.0036		0.0056	0.0184	0.0050
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-Elec	T6 instate heavy-Oth	186.9	9,957.0	0	9,957.0	2,666.9				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-NG	T6 instate heavy-NG	2.89	142.6	142.6	0	41.2	0.0001	0.0000		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0006	0.0001		0.0006	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-Dsl	T6 instate small-Dsl	1,813.4	70,523.9	70,523.9	0	20,962.6	0.0006	0.0004		0.0010				0.0010	0.0005	0.0004		0.0009				0.0009	0.0035	0.0152		0.0187	0.0242	0.0208
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-Elec	T6 instate small-Oth	1,269.6	58,342.3	0	58,342.3	14,676.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-NG	T6 instate small-NG	1.26	51.7	51.7	0	14.6	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000				0.0000	0.0002	0.0001		0.0002	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-Dsl	T6 instate small-Dsl	5,095.5	197,621.4	197,621.4	0	58,903.9	0.0014	0.0011		0.0026				0.0026	0.0012	0.0010		0.0022				0.0022	0.0094	0.0425		0.0519	0.0636	0.0582
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-Elec	T6 instate small-Oth	3,525.1	162,922.5	0	162,922.5	40,749.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-NG	T6 instate small-NG	3.92	161.9	161.9	0	45.3	0.0001	0.0001		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0005	0.0002		0.0007	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-Dsl	T6 instate small-Dsl	3,250.4	126,201.5	126,201.5	0	37,575.0	0.0009	0.0007		0.0017				0.0017	0.0008	0.0006		0.0015				0.0015	0.0061	0.0271		0.0333	0.0416	0.0372
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-Elec	T6 instate small-Oth	2,256.9	104,013.6	0	104,013.6	26,090.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-NG	T6 instate small-NG	3.87	161.8	161.8	0	44.7	0.0001	0.0001		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0005	0.0002		0.0006	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-Dsl	T6 instate heavy-Dsl	2,129.1	82,858.7	82,858.7	0	24,612.6	0.0008	0.0005		0.0013				0.0013	0.0007	0.0004		0.0011				0.0011	0.0050	0.0177		0.0227	0.0471	0.0246
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-Elec	T6 instate heavy-Oth	797.4	48,238.4	0	48,238.4	9,217.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-NG	T6 instate heavy-NG	12.0	455.4	455.4	0	138.4	0.0003	0.0002		0.0005				0.0005	0.0000	0.0000		0.0000				0.0000	0.0014	0.0004		0.0018	0.0001	0.0001
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-Dsl	T6 instate small-Dsl	31.4	1,413.4	1,413.4	0	363.3	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0003		0.0003	0.0005	0.0004
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-Elec	T6 instate small-Oth	21.2	1,240.7	0	1,240.7	245.6				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-NG	T6 instate small-NG	0.0697	3.21	3.21	0	0.8061	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-Dsl	T6 instate heavy-Dsl	1,503.3	85,389.4	85,389.4	0	17,378.1	0.0007	0.0003		0.0011				0.0011	0.0007	0.0003		0.0010				0.0010	0.0049	0.0125		0.0174	0.0425	0.0173
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-Elec	T6 instate heavy-Oth	226.5	17,040.8	0	17,040.8	2,618.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-NG	T6 instate heavy-NG	10.2	564.5	564.5	0	117.6	0.0004	0.0002		0.0006				0.0006	0.0000	0.0000		0.0000				0.0000	0.0017	0.0003		0.0020	0.0001	0.0001
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 4-Dsl	T6 OOS small-Dsl	13.3	1,001.2	1,001.2	0	304.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0001	0.0003	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 5-Dsl	T6 OOS small-Dsl	16.4	1,373.5	1,373.5	0	375.8	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0001	0.0004	0.0001
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 6-Dsl	T6 OOS small-Dsl	73.4	3,589.0	3,589.0	0	1,686.7	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0002		0.0003	0.0009	0.0002
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 7-Dsl	T6 OOS heavy-Dsl	91.4	26,096.6	26,096.6	0	2,101.3	0.0002	0.0000		0.0002				0.0002	0.0002	0.0000		0.0002				0.0002	0.0008	0.0002		0.0010	0.0067	0.0003
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-Dsl	T6 Public-Dsl	435.1	14,942.2	14,942.2	0	2,232.2	0.0004	0.0001		0.0005				0.0005	0.0003	0.0001		0.0005				0.0005	0.0012	0.0048		0.0060	0.0163	0.0094
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-Elec	T6 Public-Oth	221.9	9,138.3	0	9,138.3	1,138.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-NG	T6 Public-NG	36.4	1,275.1	1,275.1	0	186.9	0.0013	0.0007		0.0020				0.0020	0.0000	0.0000		0.0000				0.0000	0.0043	0.0022		0.0065	0.0001	0.0003
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-Dsl	T6 Public-Dsl	682.6	23,403.2	23,403.2	0	3,501.6	0.0004	0.0002		0.0007				0.0007	0.0004	0.0002		0.0006				0.0006	0.0017	0.0079		0.0096	0.0179	0.0129
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-Elec	T6 Public-Oth	343.9	14,152.8	0	14,152.8	1,764.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-NG	T6 Public-NG	54.2	1,855.1	1,855.1	0	278.0	0.0018	0.0012		0.0030				0.0030	0.0000	0.0000		0.0000				0.0000	0.0063	0.0031		0.0093	0.0002	0.0005
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-Dsl	T6 Public-Dsl	601.8	20,759.3	20,759.3	0	3,087.1	0.0004	0.0002		0.0006				0.0006	0.0003	0.0002		0.0005				0.0005	0.0015	0.0069		0.0084	0.0178	0.0116
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-Elec	T6 Public-Oth	315.3	12,891.7	0	12,891.7	1,617.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-NG	T6 Public-NG	61.0	2,110.5	2,110.5	0	312.7	0.0021	0.0012		0.0033				0.0033	0.0000	0.0000		0.0000				0.0000	0.0071	0.0038		0.0109	0.0002	0.0005
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-Dsl	T6 Public-Dsl	2,228.0	92,270.2	92,270.2	0	11,429.6	0.0017	0.0007		0.0025				0.0025	0.0015	0.0006		0.0022				0.0022	0.0064	0.0256		0.0320	0.0801	0.0425
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-Elec	T6 Public-Oth	981.5	50,909.0	0	50,909.0	5,034.9				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-NG	T6 Public-NG	218.4	9,113.9	9,113.9	0	1,120.6	0.0090	0.0044		0.0134				0.0134	0.0001	0.0001		0.0002				0.0002	0.0307	0.0136		0.0443	0.0006	0.0019
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-Dsl	T6 Utility-Dsl	51.8	2,037.2	2,037.2	0	663.5	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0003		0.0004	0.0005	0.0004
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-Elec	T6 Utility-Oth	52.9	2,218.7	0	2,218.7	677.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-NG	T6 Utility-NG	0.0561	2.21	2.21	0	0.7174	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-Dsl	T6 Utility-Dsl	9.80	385.1	385.1	0	125.4	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0001	0.0001
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-Elec	T6 Utility-Oth	10.00	419.2	0	419.2	128.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-NG	T6 Utility-NG	0.0106	0.4184	0.4184	0	0.1363	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-Dsl	T6 Utility-Dsl	10.8	516.8	516.8	0	138.7	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0001	0.0001
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-Elec	T6 Utility-Oth	11.1	602.3	0	602.3	142.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-NG	T6 Utility-NG	0.0118	0.5612	0.5612	0	0.1508	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6TS-Elec	T6TS - Gas	669.5	46,586.0	0	46,586.0	13,394.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6TS-Gas	T6TS - Gas	1,474.6	63,179.6	63,179.6	0	29,503.0	0.0015	0.0024	0.0069	0.0109	0.0042	0.0006	0.0077	0.0235	0.0010	0.0017	0.0063	0.0091	0.0042	0.0006	0.0077	0.0216	0.0175	0.0249	0.1187	0.1610	0.0070	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-Dsl	T7 CAIRP-Dsl	2,628.1	555,514.0	555,514.0	0	60,394.7	0.0080	0.0344		0.0424				0.0424	0.0070	0.0302		0.0372				0.0372	0.0238	0.4466		0.4704	0.7420	0.3572
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-Elec	T7 CAIRP-Oth	690.5	153,026.1	0	153,026.1	15,867.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-NG	T7 CAIRP-NG	11.5	2,410.2	2,410.2	0	263.6	0.0025	0.0019		0.0044				0.0044	0.0000	0.0000		0.0001				0.0001	0.0077	0.0061		0.0137	0.0004	0.0008
SACOG	All Sub-Areas	2040	Annual	T7 NNOOS Class 8-Dsl	T7 NNOOS-Dsl	2,844.9	833,129.8	833,129.8	0	65,376.5	0.0116	0.0462		0.0578				0.0578	0.0102	0.0406		0.0508				0.0508	0.0346	0.6001		0.6347	1.22	0.4799
SACOG	All Sub-Areas	2040	Annual	T7 NOOS Class 8-Dsl	T7 NOOS-Dsl	1,228.2	302,890.6	302,890.6	0	28,224.0	0.0044	0.0200		0.0243				0.0243	0.0038	0.0175		0.0214				0.0214	0.0130	0.2591		0.2720	0.4567	0.2072
SACOG	All Sub-Areas	2040	Annual	T7 Other Port Class 8-Dsl	T7 Other Port-Dsl	19.6	4,910.7	4,910.7	0	320.3	0.0001	0.0001		0.0001				0.0001	0.0001	0.0001		0.0001				0.0001	0.0003	0.0011		0.0014	0.0067	0.0009
SACOG	All Sub-Areas	2040	Annual	T7 Other Port Class 8-Elec	T7 Other Port-Oth	4.05	1,161.9	0	1,161.9	66.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 POAK Class 8-Dsl	T7 POAK-Dsl	102.2	11,902.8	11,902.8	0	1,671.6	0.0002	0.0004		0.0006				0.0006	0.0001	0.0004		0.0005				0.0005	0.0009	0.0057		0.0065	0.0171	0.0045
SACOG	All Sub-Areas	2040	Annual	T7 POAK Class 8-Elec	T7 POAK-Oth	20.3	2,332.6	0	2,332.6	332.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 POLA Class 8-Dsl	T7 POLA-Dsl	0.0000	0.0011	0.0011	0	0.0001	0	0		0				0	0	0		0				0	0	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 POLA Class 8-Elec	T7 POLA-Oth	0.0000	0.0001	0	0.0001	0.0000				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-Dsl	T7 Public-Dsl	4,138.8	165,569.5	165,569.5	0	21,232.3	0.0083	0.0060		0.0143				0.0143	0.0073	0.0053		0.0126				0.0126	0.0321	0.0736		0.1056	0.4876	0.0856
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-Elec	T7 Public-Oth	1,533.8	79,157.8	0	79,157.8	7,868.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-NG	T7 Public-NG	85.3	3,448.1	3,448.1	0	437.4	0.0067	0.0017		0.0084				0.0084	0.0001	0.0000		0.0001				0.0001	0.0319	0.0048		0.0367	0.0012	0.0007
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-Dsl	T7 SWCV-Dsl	302.7	19,623.1	19,623.1	0	1,392.2	0.0006	0.0005		0.0011				0.0011	0.0005	0.0004		0.0010				0.0010	0.0013	0.0054		0.0067	0.0682	0.0088
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-Elec	T7 SWCV-Oth	427.8	27,676.4	0	27,676.4	1,967.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-NG	T7 SWCV-NG	684.9	44,398.7	44,398.7	0	3,150.4	0.0492	0.0039		0.0532				0.0532	0.0011	0.0001		0.0011				0.0011	0.5730	0.0306		0.6036	0.0244	0.0013
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single-Dsl	127.6	8,122.3	8,122.3	0	1,201.8	0.0001	0.0003		0.0004				0.0004	0.0001	0.0003		0.0003				0.0003	0.0004	0.0039		0.0043	0.0075	0.0031
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-Elec	Single Concrete/Transit Mix	116.0	8,646.3	0	8,646.3	1,093.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-NG	T7 Single-NG	3.42	218.7	218.7	0	32.3	0.0003	0.0001		0.0004				0.0004	0.0000	0.0000		0.0000				0.0000	0.0010	0.0003		0.0013	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-Dsl	T7 Single-Dsl	924.5	44,808.6	44,808.6	0	8,708.6	0.0006	0.0022		0.0028				0.0028	0.0006	0.0019		0.0025				0.0025	0.0030	0.0280		0.0310	0.0584	0.0225
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-Elec	T7 Single Dump-Oth	369.0	25,846.0	0	25,846.0	3,476.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-NG	T7 Single-NG	26.0	1,228.4	1,228.4	0	244.5	0.0015	0.0008		0.0023				0.0023	0.0000	0.0000		0.0000				0.0000	0.0068	0.0021		0.0090	0.0003	0.0003
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-Dsl	T7 Single-Dsl	2,953.2	125,634.1	125,634.1	0	27,819.4	0.0016	0.0069		0.0085				0.0085	0.0014	0.0061		0.0075				0.0075	0.0074	0.0895		0.0969	0.1471	0.0718
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-Elec	T7 Single Other-Oth	1,438.1	86,102.7	0	86,102.7	13,547.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-NG	T7 Single-NG	86.7	3,688.0	3,688.0	0	816.5	0.0044	0.0027		0.0071				0.0071	0.0001	0.0000		0.0001				0.0001	0.0186	0.0076		0.0262	0.0008	0.0011
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-Dsl	T7 Tractor-Dsl	3,554.4	230,431.6	230,431.6	0	51,645.6	0.0030	0.0154		0.0184				0.0184	0.0026	0.0135		0.0162				0.0162	0.0126	0.2000		0.2126	0.3084	0.1601
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-Elec	T7 Tractor-Oth	512.9	38,694.8	0	38,694.8	7,451.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-NG	T7 Tractor-NG	67.2	4,204.7	4,204.7	0	975.9	0.0048	0.0038		0.0086				0.0086	0.0001	0.0001		0.0001				0.0001	0.0183	0.0112		0.0295	0.0009	0.0016
SACOG	All Sub-Areas	2040	Annual	T7 Utility Class 8-Dsl	T7 Utility-Dsl	52.9	2,166.4	2,166.4	0	677.7	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0002	0.0005		0.0008	0.0026	0.0004
SACOG	All Sub-Areas	2040	Annual	T7 Utility Class 8-Elec	T7 Utility-Oth	23.2	1,195.8	0	1,195.8	296.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7IS-Elec	T7IS - Gas	0.8135	144.2	0	144.2	16.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7IS-Gas	T7IS - Gas	1.79	202.2	202.2	0	35.9	0.0002		0.0000	0.0002	0.0000	0.0000	0.0000	0.0002	0.0001		0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0069		0.0002	0.0071	0.0005	
SACOG	All Sub-Areas	2040	Annual	UBUS-Dsl	UBUS - Dsl	32.1	3,199.5	3,199.5	0	128.4	0.0002			0.0002				0.0002	0.0002			0.0002				0.0002	0.0002			0.0002	0.0009	
SACOG	All Sub-Areas	2040	Annual	UBUS-Elec	UBUS - Oth	1,017.7	94,221.0	0	94,221.0	4,071.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	UBUS-Gas	UBUS - Gas	21.9	1,393.4	1,393.4	0	87.8	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0009		0.0006	0.0015	0.0000	
SACOG	All Sub-Areas	2040	Annual	UBUS-NG	UBUS - NG	95.9	9,413.3	9,413.3	0	383.6	0.0452			0.0452				0.0452	0.0007			0.0007				0.0007	0.5245			0.5245	0.0007	

EMFAC2021 Connector Daily VMT

NOx_STREX	NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
3.09	11.5	24,859.8	297.2	537.0	25,694.0	0.1419	0.0014	0.0091	0.1524	0.7556	1.14	2.05	0.1342	0.0013	0.0084	0.1438	0.1889	0.3998	0.7326	0.2454	0.0027	0.0057	0.2538	2,149.1	493.9	15.6
0.0070	0.0576	44.4	0.4641		44.8	0.0008	0.0000		0.0008	0.0005	0.0020	0.0033	0.0008	0.0000		0.0008	0.0001	0.0007	0.0016	0.0004	0.0000		0.0004		4.04	
	0.0009	4.71	0.1114		4.82	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.5931
	0.0011	4.30			4.30	0.0001			0.0001	0.0002	0.0002	0.0004	0.0001			0.0001	0.0000	0.0001	0.0002	0.0000			0.0000		0.3866	
	0				0				0	0.0367	0.0201	0.0568				0	0.0092	0.0070	0.0162				0			
0.7052	1.41	7,957.5		213.1	8,170.6	0.0198		0.0040	0.0238	0.2647	0.2682	0.5567	0.0182		0.0037	0.0219	0.0662	0.0939	0.1819	0.0797		0.0023	0.0820	874.4		
0.0187	0.0232	188.7		9.06	197.8	0.0004		0.0002	0.0006	0.0126	0.0065	0.0197	0.0004		0.0002	0.0005	0.0032	0.0023	0.0059	0.0019		0.0001	0.0020	21.2		
	0.0000	0.0090			0.0090	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0008	
	0				0				0	0.0005	0.0003	0.0008				0	0.0001	0.0001	0.0002				0			
0.0622	0.1248	633.1		18.7	651.8	0.0016		0.0004	0.0020	0.0180	0.0221	0.0421	0.0015		0.0003	0.0018	0.0045	0.0077	0.0141	0.0063		0.0002	0.0065	69.8		
0.0005	0.0006	5.45		0.2853	5.73	0.0000		0.0000	0.0000	0.0004	0.0002	0.0006	0.0000		0.0000	0.0000	0.0001	0.0001	0.0002	0.0001		0.0000	0.0001	0.6134		
	0.0023	20.2			20.2	0.0003			0.0003	0.0006	0.0007	0.0017	0.0003			0.0003	0.0001	0.0003	0.0007	0.0002			0.0002		1.82	
	0				0				0	0.0041	0.0023	0.0064				0	0.0010	0.0008	0.0018				0			
0.5319	1.04	5,826.8		162.4	5,989.3	0.0125		0.0025	0.0150	0.1573	0.1911	0.3635	0.0115		0.0023	0.0138	0.0393	0.0669	0.1200	0.0584		0.0017	0.0601	640.9		
0.0060	0.0074	60.4		3.58	63.9	0.0001		0.0000	0.0002	0.0041	0.0021	0.0063	0.0001		0.0000	0.0002	0.0010	0.0007	0.0019	0.0006		0.0000	0.0006	6.84		
	0.4332	359.9	2.25		362.2	0.0159	0.0005		0.0164	0.0071	0.0461	0.0697	0.0152	0.0005		0.0157	0.0018	0.0161	0.0336	0.0034	0.0000		0.0035		32.6	
	0				0				0	0.0056	0.0275	0.0331				0	0.0014	0.0096	0.0110				0			
0.1847	0.2181	651.4	2.61	7.18	661.2	0.0011		0.0001	0.0012	0.0068	0.0661	0.0741	0.0010		0.0001	0.0011	0.0017	0.0231	0.0259	0.0065	0.0000	0.0001	0.0066	70.7		
	0.2143	194.0	1.69		195.6	0.0078	0.0002		0.0080	0.0033	0.0247	0.0361	0.0075	0.0002		0.0077	0.0008	0.0087	0.0172	0.0019	0.0000		0.0019		17.6	
	0				0				0	0.0013	0.0077	0.0090				0	0.0003	0.0027	0.0030				0			
0.0202	0.0235	86.0	0.3617	0.8210	87.2	0.0001		0.0000	0.0001	0.0008	0.0091	0.0100	0.0001		0.0000	0.0001	0.0002	0.0032	0.0035	0.0009	0.0000	0.0000	0.0009	9.32		
0.0101	0.1464	44.5		2.68	47.2	0.0006		0.0003	0.0009	0.0011	0.0032	0.0052	0.0005		0.0003	0.0009	0.0003	0.0011	0.0023	0.0005		0.0000	0.0005	5.81		
	0.0022	45.7			45.7	0.0002			0.0002	0.0010	0.0013	0.0025	0.0002			0.0002	0.0003	0.0004	0.0009	0.0004			0.0004		4.12	
	0				0				0	0.0037	0.0020	0.0057				0	0.0009	0.0007	0.0016				0			
0.3558	0.6986	3,850.6		115.2	3,965.8	0.0070		0.0015	0.0086	0.0855	0.1056	0.1997	0.0065		0.0014	0.0079	0.0214	0.0370	0.0662	0.0386		0.0012	0.0398	424.1		
0.0037	0.0045	35.5		2.69	38.2	0.0001		0.0000	0.0001	0.0024	0.0012	0.0037	0.0001		0.0000	0.0001	0.0006	0.0004	0.0011	0.0004		0.0000	0.0004	4.09		
	0.0559	19.2			19.2	0.0010			0.0010	0.0003	0.0008	0.0021	0.0010			0.0010	0.0001	0.0003	0.0013	0.0002			0.0002		1.73	
0.0001	0.0037	57.0		0.0075	57.0	0.0000		0.0000	0.0000	0.0004	0.0013	0.0017	0.0000		0.0000	0.0000	0.0001	0.0005	0.0006	0.0006		0.0000	0.0006	6.07		
0.0046	0.0276	30.0	1.33		31.3	0.0005	0.0000		0.0005	0.0002	0.0016	0.0023	0.0005	0.0000		0.0005	0.0001	0.0005	0.0011	0.0003	0.0000		0.0003		2.82	
	0				0				0	0.0001	0.0002	0.0003				0	0.0000	0.0001	0.0001				0			
0.0034	0.0071	20.3	0.1543	0.2072	20.7	0.0000		0.0000	0.0000	0.0002	0.0006	0.0007	0.0000		0.0000	0.0000	0.0000	0.0002	0.0003	0.0002	0.0000	0.0000	0.0002	2.21		
	0.1067	71.4			71.4	0.0002			0.0002			0.0002	0.0002			0.0002			0.0002	0.0007			0.0007		6.43	
	0				0				0			0				0			0				0			
0.0134	0.0534	31.2	2.77		34.0	0.0002	0.0000		0.0002	0.0004	0.0013	0.0019	0.0002	0.0000		0.0002	0.0001	0.0005	0.0007	0.0003	0.0000		0.0003		3.06	
	0				0				0	0.0002	0.0004	0.0006				0	0.0000	0.0001	0.0002				0			
0.0008	0.0027	8.96	0.5184	0.0346	9.52	0.0000		0.0000	0.0000	0.0001	0.0005	0.0006	0.0000		0.0000	0.0000	0.0000	0.0002	0.0002	0.0001	0.0000	0.0000	0.0001	1.02		
	0.0002	0.6782	0.1311		0.8093	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0995
0.0001	0.0003	1.02	0.0072		1.03	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0925	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0001	0.0005	1.41	0.0090		1.42	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1275	
	0				0				0	0.0000	0.0000	0.0001				0	0.0000	0.0000	0.0000				0			
0.0006	0.0015	3.62	0.0398		3.66	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3293	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
0.0016	0.0094	32.9	0.0887		33.0	0.0002	0.0000		0.0002	0.0004	0.0016	0.0022	0.0002	0.0000		0.0002	0.0001	0.0005	0.0009	0.0003	0.0000		0.0003		2.97	
	0				0				0	0.0001	0.0002	0.0004				0	0.0000	0.0001	0.0001				0			
0.0162	0.0395	35.1	1.81		37.0	0.0001	0.0000		0.0001	0.0004	0.0016	0.0021	0.0001	0.0000		0.0001	0.0001	0.0006	0.0007	0.0003	0.0000		0.0004		3.33	
	0				0				0	0.0003	0.0006	0.0009				0	0.0001	0.0002	0.0003				0			
	0.0000	0.0160	0.0020		0.0181	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0022
0.0081	0.0195	17.4	0.9000		18.3	0.0000	0.0000		0.0000	0.0002	0.0008	0.0010	0.0000	0.0000		0.0000	0.0000	0.0003	0.0004	0.0002	0.0000		0.0002		1.65	
	0				0				0	0.0002	0.0003	0.0005				0	0.0000	0.0001	0.0001				0			
	0.0000	0.0262	0.0033		0.0295	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0036
0.0357	0.0861	76.8	3.97		80.8	0.0002	0.0000		0.0002	0.0009	0.0034	0.0045	0.0001	0.0000		0.0002	0.0002	0.0012	0.0016	0.0007	0.0000		0.0008		7.27	
	0				0				0	0.0007	0.0014	0.0020				0	0.0002	0.0005	0.0006				0			
	0.0000	0.1320	0.0167		0.1486	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0183
0.0101	0.0335	28.2	0.9829		29.2	0.0001	0.0000		0.0001	0.0003	0.0012	0.0016	0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.63	
	0				0				0	0.0001	0.0003	0.0004				0	0.0000	0.0001	0.0001				0			
	0.0000	0.1536	0.0124		0.1659	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0204
0.0292	0.0742	79.5	3.85		83.4	0.0003	0.0000		0.0003	0.0009	0.0035	0.0047	0.0003	0.0000		0.0003	0.0002	0.0012	0.0017	0.0008	0.0000		0.0008		7.50	
	0				0				0	0.0008	0.0014	0.0022				0	0.0002	0.0005	0.0007				0			
	0.0000	0.0472	0.0060		0.0532	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0065
0.0832	0.2050	223.2	10.8		234.0	0.0007	0.0000		0.0007	0.0026	0.0098	0.0131	0.0007	0.0000		0.0007	0.0007	0.0034	0.0048	0.0021	0.0001		0.0022		21.1	
	0				0				0	0.0022	0.0040	0.0062				0	0.0005	0.0014	0.0019				0			
	0.0000	0.1472	0.0187		0.1659	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0204
0.0529	0.1317	142.5	6.91		149.4	0.0005	0.0000		0.0005	0.0017	0.0062	0.0084	0.0004	0.0000		0.0005	0.0004	0.0022	0.0031	0.0014	0.0001		0.0014		13.4	
	0				0				0	0.0014	0.0026	0.0039				0	0.0003	0.0009	0.0012				0			
	0.0000	0.1469	0.0184		0.1653	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0203
0.0428	0.1145	94.3	4.77		99.1	0.0004	0.0000		0.0004	0.0011	0.0041	0.0056	0.0004	0.0000		0.0004	0.0003	0.0014	0.0021	0.0009	0.0000		0.0009		8.92	
	0				0				0	0.0006	0.0012	0.0018				0	0.0002	0.0004	0.0006				0			
	0.0001	0.4217	0.0550		0.4767	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0586
0.0005	0.0013	1.60	0.0669		1.66	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1497	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0029	0.0003		0.0033	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0004
0.0285	0.0884	89.7	3.29		93.0	0.0004	0.0000		0.0004	0.0011	0.0042	0.0057	0.0004	0.0000		0.0004	0.0003	0.0015	0.0021	0.0009	0.0000		0.0009		8.37	
	0				0				0	0.0002	0.0004	0.0006				0	0.0001	0.0001	0.0002				0			
	0.0001	0.5150	0.0464		0.5614	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0691
0.0002	0.0005	1.05	0.0071		1.06	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0951	
0.0002	0.0007	1.44	0.0087		1.45	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1305	
0.0011	0.0022	3.75	0.0389		3.79	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3408	
0.0014	0.0084	24.7	0.0485		24.7	0.0002	0.0000		0.0002	0.0003	0.0012	0.0017	0.0002	0.0000		0.0002	0.0001	0.0004	0.0007	0.0002	0.0000		0.0002		2.23	
0.0032	0.0289	18.3	1.39		19.7	0.0001	0.0000		0.0001	0.0002	0.0008	0.0011	0.0001	0.0000		0.0001	0.0000	0.0003	0.0004	0.0002	0.0000		0.0002		1.77	
	0				0				0	0.0001	0.0002	0.0004				0	0.0000	0.0001	0.0001				0			
	0.0004	1.30	0.2492		1.55	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.1904
0.0055	0.0362	28.7	2.18		30.9	0.0001	0.0000		0.0001	0.0003	0.0012	0.0016	0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.78	
	0				0				0	0.0002	0.0004	0.0005				0	0.0000	0.0001	0.0002				0			
	0.0006	1.91	0.3660		2.27	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.2796
0.0047	0.0342	25.2	1.89		27.0	0.0001	0.0000		0.0001	0.0003	0.0011	0.0014	0.0001	0.0000		0.0001	0.0001	0.0004	0.0005	0.0002	0.0000		0.0003		2.43	
	0				0				0	0.0002	0.0003	0.0005				0	0.0000	0.0001	0.0002				0			
	0.0007	2.16	0.4201		2.58	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001				0			0.3173
0.0182	0.1409	110.3	6.88		117.2	0.0005	0.0000		0.0005	0.0012	0.0047	0.0064	0.0005	0.0000		0.0005	0.0003	0.0016	0.0024	0.0011	0.0001		0.0011		10.5	
	0				0				0	0.0007	0.0013	0.0020				0	0.0002	0.0005	0.0006				0			
	0.0025	9.29	1.50		10.8	0.0000	0.0000		0.0000	0.0001	0.0005	0.0006	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002				0			1.33
0.0006	0.0015	2.29	0.0807		2.37	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.2134	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0021	0.0002		0.0023	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0003
0.0001	0.0003	0.4327	0.0152		0.4480	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0403	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0004	0.0000		0.0004	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0001
0.0001	0.0003	0.5805	0.0169		0.5974	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0538	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0005	0.0000		0.0006	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0001
	0				0				0	0.0006	0.0012	0.0018				0	0.0002	0.0004	0.0006				0			
0.0110	0.0182	109.5	0.7339	1.05	111.3	0.0001		0.0000	0.0001	0.0008	0.0031	0.0041	0.0001		0.0000	0.0001	0.0002	0.0011	0.0014	0.0011	0.0000	0.0000	0.0011	11.9		
0.1057	1.20	780.8	58.0		838.8	0.0183	0.0001		0.0184	0.0220	0.0500	0.0904	0.0175	0.0001		0.0176	0.0055	0.0175	0.0406	0.0074	0.0006		0.0080		75.5	
	0				0				0	0.0061	0.0069	0.0130				0	0.0015	0.0024	0.0039				0			
	0.0012	2.56	0.5723		3.13	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.3854
0.1712	1.87	1,120.8	74.7		1,195.6	0.0268	0.0002		0.0270	0.0331	0.0750	0.1350	0.0257	0.0002		0.0258	0.0083	0.0262	0.0603	0.0107	0.0007		0.0114		107.6	
0.0739	0.7378	407.2	32.2		439.5	0.0103	0.0001		0.0104	0.0120	0.0273	0.0497	0.0099	0.0001		0.0099	0.0030	0.0095	0.0225	0.0039	0.0003		0.0042		39.6	
0.0006	0.0082	7.39	0.1404		7.53	0.0001	0.0000		0.0001	0.0002	0.0005	0.0008	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		0.6777	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
0.0034	0.0251	17.9	0.7326		18.6	0.0002	0.0000		0.0002	0.0005	0.0012	0.0019	0.0002	0.0000		0.0002	0.0001	0.0004	0.0008	0.0002	0.0000		0.0002		1.67	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0001				0			
0.0000	0.0000	0.0000	0.0000		0.0000	0	0		0	0	0.0000	0.0000	0	0		0	0	0	0	0	0		0		0.0000	
	0				0				0	0	0	0				0	0	0	0				0			
0.1234	0.6966	301.0	12.3		313.3	0.0023	0.0001		0.0023	0.0066	0.0195	0.0284	0.0022	0.0001		0.0022	0.0016	0.0068	0.0107	0.0029	0.0001		0.0030		28.2	
	0				0				0	0.0031	0.0047	0.0079				0	0.0008	0.0017	0.0024				0			
	0.0019	5.27	0.5113		5.78	0.0000	0.0000		0.0000	0.0001	0.0004	0.0006	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002				0			0.7115
0.0059	0.0829	74.3	1.04		75.4	0.0004	0.0000		0.0004	0.0008	0.0045	0.0057	0.0003	0.0000		0.0004	0.0002	0.0016	0.0021	0.0007	0.0000		0.0007		6.78	
	0				0				0	0.0011	0.0032	0.0043				0	0.0003	0.0011	0.0014				0			
	0.0257	63.1	4.55		67.6	0.0001	0.0000		0.0001	0.0018	0.0103	0.0121	0.0001	0.0000		0.0001	0.0004	0.0036	0.0041				0			8.31
0.0032	0.0137	13.0	0.5218		13.5	0.0001	0.0000		0.0001	0.0003	0.0008	0.0012	0.0001	0.0000		0.0001	0.0001	0.0003	0.0005	0.0001	0.0000		0.0001		1.22	
	0				0				0	0.0003	0.0004	0.0008				0	0.0001	0.0001	0.0002				0			
	0.0001	0.2555	0.0313		0.2868	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0353
0.0265	0.1074	75.0	4.14		79.1	0.0009	0.0000		0.0009	0.0018	0.0042	0.0069	0.0009	0.0000		0.0009	0.0004	0.0015	0.0028	0.0007	0.0000		0.0008		7.12	
	0				0				0	0.0010	0.0013	0.0023				0	0.0003	0.0004	0.0007				0			
	0.0007	1.51	0.2445		1.75	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001				0			0.2152
0.0852	0.3041	206.7	12.7		219.4	0.0024	0.0000		0.0024	0.0050	0.0119	0.0193	0.0023	0.0000		0.0023	0.0012	0.0042	0.0077	0.0020	0.0001		0.0021		19.7	
	0				0				0	0.0034	0.0042	0.0076				0	0.0009	0.0015	0.0023				0			
	0.0019	4.39	0.8003		5.19	0.0000	0.0000		0.0000	0.0001	0.0004	0.0005	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002				0			0.6389
0.1988	0.6673	330.0	26.8		356.9	0.0056	0.0001		0.0057	0.0091	0.0215	0.0363	0.0054	0.0001		0.0054	0.0023	0.0075	0.0152	0.0031	0.0003		0.0034		32.1	
	0				0				0	0.0015	0.0018	0.0034				0	0.0004	0.0006	0.0010				0			
	0.0024	4.76	1.12		5.88	0.0000	0.0000		0.0000	0.0002	0.0004	0.0006	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002				0			0.7227
0.0031	0.0062	3.73	0.0799		3.81	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3433	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0000	0.0005	0.3943		0.0014	0.3957	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0434		
	0.0009	3.44			3.44	0.0000			0.0000	0.0001	0.0004	0.0005	0.0000			0.0000	0.0000	0.0001	0.0002	0.0000			0.0000		0.3095	
	0				0				0	0.0027	0.0057	0.0084				0	0.0007	0.0020	0.0027				0			
0.0000	0.0001	1.32		0.0026	1.32	0.0000		0.0000	0.0000	0.0000	0.0001	0.0002	0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0000	0.1412		
	0.0007	13.0			13.0	0.0000			0.0000	0.0004	0.0011	0.0015	0.0000			0.0000	0.0001	0.0004	0.0005				0			1.60

EMFAC2021 No Connector
Daily Congested VMT

Area	Sub-Area	Cal. Year	Season	Veh_Tech	EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS	TOG_TOTAL	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS	ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX	NOx_IDLEX
SACOG	All Sub-Areas	2040	Annual	All Vehicles	All Vehicles	144,907.9	5,405,558.2	4,789,113.6	616,444.7	731,045.9	0.0757	0.0126	0.1317	0.2200	0.1974	0.0605	0.1602	0.6381	0.0490	0.0091	0.1204	0.1785	0.1974	0.0605	0.1602	0.5966	3.27	0.1457	1.42	4.83	0.4588	0.1163
SACOG	All Sub-Areas	2040	Annual	All Other Buses-Dsl	All Other Buses - Dsl	58.5	3,028.0	3,028.0	0	520.7	0.0002	0.0000		0.0002				0.0002	0.0002	0.0000		0.0002				0.0002	0.0007	0.0001		0.0008	0.0038	0.0001
SACOG	All Sub-Areas	2040	Annual	All Other Buses-NG	All Other Buses - Oth	7.75	407.8	407.8	0	68.9	0.0004	0.0000		0.0004				0.0004	0.0000	0.0000		0.0000				0.0000	0.0015	0.0001		0.0016	0.0001	0.0000
SACOG	All Sub-Areas	2040	Annual	LDA-Dsl	LDA - Dsl	49.4	1,462.2	1,462.2	0	209.6	0.0000			0.0000				0.0000	0.0000			0.0000				0.0000	0.0003			0.0003	0.0001	
SACOG	All Sub-Areas	2040	Annual	LDA-Elec	LDA - Oth	7,481.6	309,500.4	0	309,500.4	35,343.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LDA-Gas	LDA - Gas	58,749.6	2,217,671.8	2,217,671.8	0	270,736.8	0.0121		0.0496	0.0617	0.0753	0.0146	0.0535	0.2050	0.0083		0.0453	0.0536	0.0753	0.0146	0.0535	0.1969	1.32		0.5490	1.87	0.0519	
SACOG	All Sub-Areas	2040	Annual	LDA-Phe	LDA - Gas	2,679.8	105,728.5	43,660.9	62,067.6	11,080.8	0.0002		0.0023	0.0025	0.0025	0.0005	0.0010	0.0065	0.0002		0.0021	0.0022	0.0025	0.0005	0.0010	0.0062	0.0231		0.0161	0.0392	0.0003	
SACOG	All Sub-Areas	2040	Annual	LDT1-Dsl	LDT1 - Dsl	0.0475	1.64	1.64	0	0.2092	0.0000			0.0000				0.0000	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000	
SACOG	All Sub-Areas	2040	Annual	LDT1-Elec	LDT1 - Oth	93.6	4,009.5	0	4,009.5	446.9				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LDT1-Gas	LDT1 - Gas	4,327.9	146,063.6	146,063.6	0	19,112.2	0.0011		0.0045	0.0056	0.0098	0.0018	0.0068	0.0239	0.0008		0.0041	0.0049	0.0098	0.0018	0.0068	0.0232	0.1004		0.0452	0.1456	0.0045	
SACOG	All Sub-Areas	2040	Annual	LDT1-Phe	LDT1 - Gas	71.4	2,985.5	1,217.5	1,768.0	295.3	0.0000		0.0001	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000		0.0001	0.0001	0.0000	0.0000	0.0000	0.0001	0.0006		0.0004	0.0011	0.0000	
SACOG	All Sub-Areas	2040	Annual	LDT2-Dsl	LDT2 - Dsl	128.3	4,825.0	4,825.0	0	592.1	0.0001			0.0001				0.0001	0.0001			0.0001				0.0001	0.0008			0.0008	0.0002	
SACOG	All Sub-Areas	2040	Annual	LDT2-Elec	LDT2 - Oth	1,144.1	33,650.4	0	33,650.4	5,455.9				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LDT2-Gas	LDT2 - Gas	34,414.6	1,272,273.8	1,272,273.8	0	157,556.5	0.0096		0.0361	0.0456	0.0496	0.0091	0.0362	0.1405	0.0065		0.0330	0.0395	0.0496	0.0091	0.0362	0.1344	0.8893		0.3925	1.28	0.0359	
SACOG	All Sub-Areas	2040	Annual	LDT2-Phe	LDT2 - Gas	824.8	32,796.2	13,461.5	19,334.8	3,410.6	0.0001		0.0007	0.0008	0.0006	0.0001	0.0002	0.0017	0.0000		0.0006	0.0007	0.0006	0.0001	0.0002	0.0016	0.0071		0.0050	0.0121	0.0001	
SACOG	All Sub-Areas	2040	Annual	LHD1-Dsl	LHD1 - Dsl	1,150.7	37,383.1	37,383.1	0	14,474.8	0.0054	0.0002		0.0056				0.0056	0.0047	0.0001		0.0049				0.0049	0.0130	0.0012		0.0142	0.0264	0.0018
SACOG	All Sub-Areas	2040	Annual	LHD1-Elec	LHD1 - Oth	923.2	45,534.7	0	45,534.7	12,936.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LHD1-Gas	LHD1 - Gas	1,612.0	54,025.4	54,025.4	0	24,016.1	0.0005	0.0009	0.0033	0.0046	0.0050	0.0008	0.0064	0.0168	0.0003	0.0006	0.0030	0.0039	0.0050	0.0008	0.0064	0.0161	0.0351	0.0067	0.0832	0.1250	0.0023	0.0001
SACOG	All Sub-Areas	2040	Annual	LHD2-Dsl	LHD2 - Dsl	538.5	17,219.3	17,219.3	0	6,773.3	0.0027	0.0001		0.0028				0.0028	0.0024	0.0001		0.0025				0.0025	0.0066	0.0005		0.0071	0.0134	0.0008
SACOG	All Sub-Areas	2040	Annual	LHD2-Elec	LHD2 - Oth	231.4	11,002.4	0	11,002.4	3,064.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	LHD2-Gas	LHD2 - Gas	201.4	6,610.3	6,610.3	0	3,000.1	0.0000	0.0001	0.0004	0.0005	0.0007	0.0001	0.0009	0.0021	0.0000	0.0001	0.0003	0.0004	0.0007	0.0001	0.0009	0.0020	0.0044	0.0008	0.0107	0.0160	0.0002	0.0000
SACOG	All Sub-Areas	2040	Annual	MCY-Gas	MCY - Gas	3,396.8	17,350.1	17,350.1	0	6,793.6	0.0217		0.0090	0.0308	0.0182	0.0269	0.0300	0.1058	0.0176		0.0083	0.0259	0.0182	0.0269	0.0300	0.1009	0.2150		0.0606	0.2756	0.0097	
SACOG	All Sub-Areas	2040	Annual	MDV-Dsl	MDV - Dsl	250.3	8,220.6	8,220.6	0	1,112.2	0.0001			0.0001				0.0001	0.0001			0.0001				0.0001	0.0017			0.0017	0.0001	
SACOG	All Sub-Areas	2040	Annual	MDV-Elec	MDV - Oth	1,034.2	30,125.2	0	30,125.2	4,915.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	MDV-Gas	MDV - Gas	19,925.7	695,518.7	695,518.7	0	90,014.5	0.0062		0.0247	0.0309	0.0344	0.0063	0.0244	0.0960	0.0043		0.0225	0.0268	0.0344	0.0063	0.0244	0.0919	0.5170		0.2393	0.7562	0.0245	
SACOG	All Sub-Areas	2040	Annual	MDV-Phe	MDV - Gas	504.2	19,396.4	7,968.8	11,427.7	2,084.7	0.0000		0.0004	0.0005	0.0004	0.0001	0.0002	0.0011	0.0000		0.0004	0.0004	0.0004	0.0001	0.0002	0.0010	0.0042		0.0030	0.0072	0.0001	
SACOG	All Sub-Areas	2040	Annual	MH-Dsl	MH - Dsl	124.1	1,103.8	1,103.8	0	12.4	0.0001			0.0001				0.0001	0.0001			0.0001				0.0001	0.0004			0.0004	0.0037	
SACOG	All Sub-Areas	2040	Annual	MH-Gas	MH - Gas	187.2	1,900.1	1,900.1	0	18.7	0.0000		0.0000	0.0000	0.0006	0.0001	0.0000	0.0007	0.0000		0.0000	0.0000	0.0006	0.0001	0.0000	0.0007	0.0004		0.0001	0.0004	0.0003	
SACOG	All Sub-Areas	2040	Annual	Motor Coach-Dsl	Motor Coach - Dsl	11.6	1,454.4	1,454.4	0	266.2	0.0000	0.0001		0.0001				0.0001	0.0000	0.0001		0.0001				0.0001	0.0001	0.0008		0.0008	0.0016	0.0003
SACOG	All Sub-Areas	2040	Annual	OBUS-Elec	OBUS - Oth	8.52	612.2	0	612.2	170.5				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	OBUS-Gas	OBUS - Gas	30.7	872.4	872.4	0	613.8	0.0001	0.0000	0.0001	0.0002	0.0002	0.0000	0.0002	0.0006	0.0000	0.0000	0.0001	0.0002	0.0002	0.0000	0.0002	0.0005	0.0009	0.0002	0.0025	0.0036	0.0003	0.0000
SACOG	All Sub-Areas	2040	Annual	PTO-Dsl	PTO-Dsl	0	2,622.9	2,622.9	0		0.0001			0.0001				0.0001	0.0000			0.0000				0.0000	0.0005			0.0005	0.0077	
SACOG	All Sub-Areas	2040	Annual	PTO-Elec	PTO-Oth	0	1,737.4	0	1,737.4					0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	SBUS-Dsl	SBUS - Dsl	92.0	1,918.5	1,918.5	0	1,331.6	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0002	0.0007		0.0009	0.0018	0.0011
SACOG	All Sub-Areas	2040	Annual	SBUS-Elec	SBUS - Oth	5.23	1,138.5	0	1,138.5	523.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	SBUS-Gas	SBUS - Gas	15.8	825.0	825.0	0	63.1	0.0000	0.0003	0.0000	0.0003	0.0001	0.0000	0.0000	0.0004	0.0000	0.0002	0.0000	0.0002	0.0001	0.0000	0.0000	0.0004	0.0002	0.0014	0.0006	0.0022	0.0001	0.0000
SACOG	All Sub-Areas	2040	Annual	SBUS-NG	SBUS-Oth	2.63	56.7	56.7	0	38.1	0.0001	0.0000		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0004	0.0001		0.0005	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 4-Dsl	T6 CAIRP small-Dsl	0.9628	69.1	69.1	0	22.1	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 4-Elec	T6 CAIRP small-Oth	0.9328	76.7	0	76.7	21.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 5-Dsl	T6 CAIRP small-Dsl	1.19	95.2	95.2	0	27.4	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 5-Elec	T6 CAIRP small-Oth	1.14	104.8	0	104.8	26.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 6-Dsl	T6 CAIRP small-Dsl	5.30	245.7	245.7	0	121.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 6-Elec	T6 CAIRP small-Oth	5.25	277.0	0	277.0	120.7				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 7-Dsl	T6 CAIRP heavy-Dsl	12.1	2,536.1	2,536.1	0	279.0	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0006	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 7-Elec	T6 CAIRP heavy-Oth	3.35	742.4	0	742.4	77.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-Dsl	T6 instate small-Dsl	73.1	2,400.2	2,400.2	0	1,042.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0002	0.0006		0.0007	0.0011	0.0008
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-Elec	T6 instate small-Oth	52.0	1,926.0	0	1,926.0	741.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-NG	T6 instate small-NG	0.0241	0.8028	0.8028	0	0.3442	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-Dsl	T6 instate small-Dsl	35.8	1,174.3	1,174.3	0	511.1	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0003		0.0004	0.0005	0.0004
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-Elec	T6 instate small-Oth	25.2	934.1	0	934.1	359.9				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-NG	T6 instate small-NG	0.0394	1.32	1.32	0	0.5619	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-Dsl	T6 instate small-Dsl	154.5	5,067.2	5,067.2	0	2,205.2	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0012		0.0015	0.0022	0.0016
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-Elec	T6 instate small-Oth	108.7	4,021.7	0	4,021.7	1,551.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-NG	T6 instate small-NG	0.1973	6.64	6.64	0	2.82	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-Dsl	T6 instate heavy-Dsl	32.9	1,645.0	1,645.0	0	469.6	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0003		0.0004	0.0013	0.0004
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-Elec	T6 instate heavy-Oth	13.3	713.6	0	713.6	190.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-NG	T6 instate heavy-NG	0.2700	13.3	13.3	0	3.85	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-Dsl	T6 instate small-Dsl	128.2	5,002.5	5,002.5	0	1,482.2	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0002	0.0011		0.0013	0.0017	0.0015
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-Elec	T6 instate small-Oth	90.6	4,172.4	0	4,172.4	1,047.5				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-NG	T6 instate small-NG	0.0659	2.71	2.71	0	0.7621	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-Dsl	T6 instate small-Dsl	351.3	13,668.2	13,668.2	0	4,061.2	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001		0.0002				0.0002	0.0006	0.0029		0.0036	0.0044	0.0040
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-Elec	T6 instate small-Oth	246.5	11,401.6	0	11,401.6	2,849.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-NG	T6 instate small-NG	0.2053	8.48	8.48	0	2.37	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-Dsl	T6 instate small-Dsl	234.1	9,113.9	9,113.9	0	2,705.7	0.0001	0.0001		0.0001				0.0001	0.0001	0.0000		0.0001				0.0001	0.0004	0.0020		0.0024	0.0030	0.0027
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-Elec	T6 instate small-Oth	164.3	7,575.9	0	7,575.9	1,899.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-NG	T6 instate small-NG	0.2024	8.47	8.47	0	2.34	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-Dsl	T6 instate heavy-Dsl	147.3	5,767.1	5,767.1	0	1,703.0	0.0001	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0003	0.0012		0.0016	0.0032	0.0017
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-Elec	T6 instate heavy-Oth	56.4	3,420.3	0	3,420.3	652.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-NG	T6 instate heavy-NG	1.12	42.6	42.6	0	12.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0002	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-Dsl	T6 instate small-Dsl	1.86	83.7	83.7	0	21.5	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-Elec	T6 instate small-Oth	1.27	74.1	0	74.1	14.7				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-NG	T6 instate small-NG	0.0037	0.1682	0.1682	0	0.0422	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-Dsl	T6 instate heavy-Dsl	112.3	6,410.3	6,410.3	0	1,298.3	0.0001	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0004	0.0009		0.0013	0.0031	0.0013
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-Elec	T6 instate heavy-Oth	17.2	1,299.0	0	1,299.0	199.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-NG	T6 instate heavy-NG	0.9518	52.8	52.8	0	11.0	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000				0.0000	0.0002	0.0000		0.0002	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 4-Dsl	T6 OOS small-Dsl	0.9960	75.5	75.5	0	22.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 5-Dsl	T6 OOS small-Dsl	1.23	103.6	103.6	0	28.2	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 6-Dsl	T6 OOS small-Dsl	5.51	270.6	270.6	0	126.7	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0001	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 7-Dsl	T6 OOS heavy-Dsl	6.87	1,967.5	1,967.5	0	157.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0005	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-Dsl	T6 Public-Dsl	34.8	1,194.2	1,194.2	0	178.4	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0004		0.0005	0.0013	0.0008
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-Elec	T6 Public-Oth	18.0	741.0	0	741.0	92.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-NG	T6 Public-NG	3.41	119.3	119.3	0	17.5	0.0001	0.0001		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0004	0.0002		0.0006	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-Dsl	T6 Public-Dsl	52.2	1,791.2	1,791.2	0	268.0	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000				0.0000	0.0001	0.0006		0.0007	0.0014	0.0010
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-Elec	T6 Public-Oth	26.7	1,099.4	0	1,099.4	137.1				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-NG	T6 Public-NG	5.07	173.5	173.5	0	26.0	0.0002	0.0001		0.0003				0.0003	0.0000	0.0000		0.0000				0.0000	0.0006	0.0003		0.0009	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-Dsl	T6 Public-Dsl	52.0	1,793.9	1,793.9	0	266.8	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0000				0.0000	0.0001	0.0006		0.0007	0.0015	0.0010
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-Elec	T6 Public-Oth	27.4	1,121.7	0	1,121.7	140.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-NG	T6 Public-NG	5.70	197.4	197.4	0	29.2	0.0002	0.0001		0.0003				0.0003	0.0000	0.0000		0.0000				0.0000	0.0007	0.0004		0.0010	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-Dsl	T6 Public-Dsl	190.9	7,907.7	7,907.7	0	979.5	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001		0.0002				0.0002	0.0005	0.0022		0.0027	0.0070	0.0037
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-Elec	T6 Public-Oth	84.9	4,400.8	0	4,400.8	435.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-NG	T6 Public-NG	20.4	852.4	852.4	0	104.8	0.0008	0.0004		0.0013				0.0013	0.0000	0.0000		0.0000				0.0000	0.0029	0.0013		0.0041	0.0001	0.0002
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-Dsl	T6 Utility-Dsl	3.29	129.1	129.1	0	42.1	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-Elec	T6 Utility-Oth	3.35	140.3	0	140.3	42.8				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-NG	T6 Utility-NG	0.0052	0.2062	0.2062	0	0.0671	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-Dsl	T6 Utility-Dsl	0.6211	24.4	24.4	0	7.95	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-Elec	T6 Utility-Oth	0.6324	26.5	0	26.5	8.09				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-NG	T6 Utility-NG	0.0010	0.0391	0.0391	0	0.0127	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-Dsl	T6 Utility-Dsl	0.6873	32.7	32.7	0	8.80	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-Elec	T6 Utility-Oth	0.7044	38.1	0	38.1	9.02				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-NG	T6 Utility-NG	0.0011	0.0525	0.0525	0	0.0141	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T6TS-Elec	T6TS - Gas	47.4	3,364.3	0	3,364.3	948.5				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T6TS-Gas	T6TS - Gas	105.1	4,530.1	4,530.1	0	2,103.3	0.0001	0.0002	0.0005	0.0008	0.0003	0.0000	0.0006	0.0017	0.0001	0.0001	0.0005	0.0006	0.0003	0.0000	0.0006	0.0016	0.0013	0.0018	0.0085	0.0115	0.0005	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-Dsl	T7 CAIRP-Dsl	164.5	34,693.0	34,693.0	0	3,779.3	0.0005	0.0022		0.0027				0.0027	0.0004	0.0019		0.0023				0.0023	0.0015	0.0279		0.0294	0.0463	0.0224
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-Elec	T7 CAIRP-Oth	43.3	9,582.8	0	9,582.8	995.7				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-NG	T7 CAIRP-NG	1.07	225.4	225.4	0	24.7	0.0002	0.0002		0.0004				0.0004	0.0000	0.0000		0.0000				0.0000	0.0007	0.0006		0.0013	0.0000	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 NNOOS Class 8-Dsl	T7 NNOOS-Dsl	176.9	51,837.4	51,837.4	0	4,064.4	0.0007	0.0029		0.0036				0.0036	0.0006	0.0025		0.0032				0.0032	0.0022	0.0373		0.0395	0.0759	0.0298
SACOG	All Sub-Areas	2040	Annual	T7 NOOS Class 8-Dsl	T7 NOOS-Dsl	76.4	18,847.2	18,847.2	0	1,754.8	0.0003	0.0012		0.0015				0.0015	0.0002	0.0011		0.0013				0.0013	0.0008	0.0161		0.0169	0.0284	0.0129
SACOG	All Sub-Areas	2040	Annual	T7 Other Port Class 8-Dsl	T7 Other Port-Dsl	1.32	332.1	332.1	0	21.7	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0001		0.0001	0.0005	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 Other Port Class 8-Elec	T7 Other Port-Oth	0.2739	78.6	0	78.6	4.48				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 POAK Class 8-Dsl	T7 POAK-Dsl	5.83	679.2	679.2	0	95.4	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0003		0.0004	0.0010	0.0003
SACOG	All Sub-Areas	2040	Annual	T7 POAK Class 8-Elec	T7 POAK-Oth	1.16	133.1	0	133.1	19.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 POLA Class 8-Dsl	T7 POLA-Dsl	0.0000	0.0001	0.0001	0	0.0000	0	0		0				0	0	0		0				0	0	0		0	0	0
SACOG	All Sub-Areas	2040	Annual	T7 POLA Class 8-Elec	T7 POLA-Oth	0.0000	0.0000	0	0.0000	0.0000				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-Dsl	T7 Public-Dsl	344.5	13,782.2	13,782.2	0	1,767.2	0.0007	0.0005		0.0012				0.0012	0.0006	0.0004		0.0011				0.0011	0.0027	0.0061		0.0088	0.0409	0.0072
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-Elec	T7 Public-Oth	128.1	6,605.7	0	6,605.7	657.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-NG	T7 Public-NG	7.79	315.0	315.0	0	39.9	0.0006	0.0002		0.0008				0.0008	0.0000	0.0000		0.0000				0.0000	0.0029	0.0004		0.0033	0.0001	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-Dsl	T7 SWCV-Dsl	16.9	1,099.0	1,099.0	0	78.0	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000		0.0001				0.0001	0.0001	0.0003		0.0003	0.0051	0.0006
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-Elec	T7 SWCV-Oth	34.0	2,198.1	0	2,198.1	156.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-NG	T7 SWCV-NG	61.4	3,980.1	3,980.1	0	282.4	0.0043	0.0003		0.0046				0.0046	0.0001	0.0000		0.0001				0.0001	0.0510	0.0027		0.0537	0.0022	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single-Dsl	10.6	675.4	675.4	0	99.9	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0003		0.0004	0.0006	0.0003
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-Elec	Single Concrete/Transit Mix	9.65	719.9	0	719.9	90.9				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-NG	T7 Single-NG	0.2951	18.9	18.9	0	2.78	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0001	0.0000		0.0001	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-Dsl	T7 Single-Dsl	60.0	2,909.6	2,909.6	0	565.4	0.0000	0.0001		0.0002				0.0002	0.0000	0.0001		0.0002				0.0002	0.0002	0.0018		0.0020	0.0038	0.0015
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-Elec	T7 Single Dump-Oth	24.0	1,683.8	0	1,683.8	226.3				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-NG	T7 Single-NG	1.80	86.2	86.2	0	17.0	0.0001	0.0001		0.0002				0.0002	0.0000	0.0000		0.0000				0.0000	0.0005	0.0001		0.0006	0.0000	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-Dsl	T7 Single-Dsl	213.4	9,241.7	9,241.7	0	2,010.3	0.0001	0.0005		0.0006				0.0006	0.0001	0.0004		0.0005				0.0005	0.0005	0.0065		0.0070	0.0108	0.0052
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-Elec	T7 Single Other-Oth	104.0	6,346.0	0	6,346.0	979.4				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-NG	T7 Single-NG	6.38	277.8	277.8	0	60.1	0.0003	0.0002		0.0005				0.0005	0.0000	0.0000		0.0000				0.0000	0.0014	0.0006		0.0020	0.0001	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-Dsl	T7 Tractor-Dsl	229.5	14,969.7	14,969.7	0	3,335.0	0.0002	0.0010		0.0012				0.0012	0.0002	0.0009		0.0010				0.0010	0.0008	0.0129		0.0137	0.0200	0.0103
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-Elec	T7 Tractor-Oth	33.0	2,503.6	0	2,503.6	479.2				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-NG	T7 Tractor-NG	3.39	213.2	213.2	0	49.3	0.0002	0.0002		0.0004				0.0004	0.0000	0.0000		0.0000				0.0000	0.0009	0.0006		0.0015	0.0000	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 Utility Class 8-Dsl	T7 Utility-Dsl	3.36	137.5	137.5	0	43.1	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000		0.0001	0.0002	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 Utility Class 8-Elec	T7 Utility-Oth	1.46	75.4	0	75.4	18.7				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7IS-Elec	T7IS - Gas	0.0576	10.4	0	10.4	1.15				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	T7IS-Gas	T7IS - Gas	0.1214	14.3	14.3	0	2.43	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005		0.0000	0.0005	0.0000	
SACOG	All Sub-Areas	2040	Annual	UBUS-Dsl	UBUS - Dsl	1.79	179.2	179.2	0	7.15	0.0000			0.0000				0.0000	0.0000			0.0000				0.0000	0.0000			0.0000	0.0000	
SACOG	All Sub-Areas	2040	Annual	UBUS-Elec	UBUS - Oth	76.5	6,926.7	0	6,926.7	306.0				0				0				0				0				0		
SACOG	All Sub-Areas	2040	Annual	UBUS-Gas	UBUS - Gas	1.11	70.5	70.5	0	4.44	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0001	0.0000	
SACOG	All Sub-Areas	2040	Annual	UBUS-NG	UBUS - NG	8.37	825.8	825.8	0	33.5	0.0040			0.0040				0.0040	0.0001			0.0001				0.0001	0.0463			0.0463	0.0001	

EMFAC2021 No Connector
Daily Congested VMT

NOx_STREX	NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
0.2205	0.7955	1,779.7	20.0	39.3	1,839.0	0.0096	0.0001	0.0007	0.0104	0.0542	0.0813	0.1459	0.0091	0.0001	0.0006	0.0098	0.0136	0.0284	0.0518	0.0176	0.0002	0.0004	0.0182	155.8	33.5	1.36
0.0005	0.0045	3.40	0.0352		3.43	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3091	
	0.0001	0.3948	0.0093		0.4040	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0497
	0.0001	0.3140			0.3140	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0283	
	0				0				0	0.0027	0.0015	0.0042				0	0.0007	0.0005	0.0012				0			
0.0533	0.1052	588.4		16.0	604.4	0.0015		0.0003	0.0018	0.0196	0.0198	0.0412	0.0014		0.0003	0.0016	0.0049	0.0069	0.0135	0.0059		0.0002	0.0061	64.7		
0.0014	0.0017	14.0		0.6792	14.6	0.0000		0.0000	0.0000	0.0009	0.0005	0.0015	0.0000		0.0000	0.0000	0.0002	0.0002	0.0004	0.0001		0.0000	0.0001	1.57		
	0.0000	0.0007			0.0007	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0001	
	0				0				0	0.0000	0.0000	0.0001				0	0.0000	0.0000	0.0000				0			
0.0045	0.0090	45.4		1.35	46.7	0.0001		0.0000	0.0001	0.0013	0.0016	0.0030	0.0001		0.0000	0.0001	0.0003	0.0006	0.0010	0.0005		0.0000	0.0005	5.00		
0.0000	0.0000	0.3895		0.0207	0.4102	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0439		
	0.0002	1.44			1.44	0.0000			0.0000	0.0000	0.0001	0.0001	0.0000			0.0000	0.0000	0.0000	0.0001	0.0000			0.0000		0.1292	
	0				0				0	0.0003	0.0002	0.0005				0	0.0001	0.0001	0.0001				0			
0.0382	0.0741	415.7		11.7	427.4	0.0009		0.0002	0.0011	0.0112	0.0136	0.0259	0.0008		0.0002	0.0010	0.0028	0.0048	0.0086	0.0042		0.0001	0.0043	45.7		
0.0004	0.0005	4.31		0.2590	4.57	0.0000		0.0000	0.0000	0.0003	0.0001	0.0005	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0000	0.0000	0.4884		
	0.0282	25.0	0.1537		25.2	0.0011	0.0000		0.0011	0.0005	0.0032	0.0048	0.0010	0.0000		0.0011	0.0001	0.0011	0.0023	0.0002	0.0000		0.0002		2.27	
	0				0				0	0.0004	0.0020	0.0024				0	0.0001	0.0007	0.0008				0			
0.0129	0.0152	45.7	0.1826	0.5024	46.4	0.0001		0.0000	0.0001	0.0005	0.0046	0.0052	0.0001		0.0000	0.0001	0.0001	0.0016	0.0018	0.0005	0.0000	0.0000	0.0005	4.96		
	0.0142	13.5	0.1161		13.6	0.0005	0.0000		0.0005	0.0002	0.0017	0.0025	0.0005	0.0000		0.0005	0.0001	0.0006	0.0012	0.0001	0.0000		0.0001		1.22	
	0				0				0	0.0001	0.0006	0.0006				0	0.0000	0.0002	0.0002				0			
0.0015	0.0017	6.28	0.0266	0.0604	6.37	0.0000		0.0000	0.0000	0.0001	0.0007	0.0007	0.0000		0.0000	0.0000	0.0000	0.0002	0.0003	0.0001	0.0000	0.0000	0.0001	0.6810		
0.0007	0.0104	3.19		0.1900	3.38	0.0000		0.0000	0.0001	0.0001	0.0002	0.0004	0.0000		0.0000	0.0001	0.0000	0.0001	0.0002	0.0000		0.0000	0.0000	0.4159		
	0.0001	3.24			3.24	0.0000			0.0000	0.0001	0.0001	0.0002	0.0000			0.0000	0.0000	0.0000	0.0001	0.0000			0.0000		0.2913	
	0				0				0	0.0003	0.0001	0.0004				0	0.0001	0.0001	0.0001				0			
0.0254	0.0499	276.1		8.27	284.4	0.0005		0.0001	0.0006	0.0061	0.0076	0.0143	0.0005		0.0001	0.0006	0.0015	0.0027	0.0047	0.0028		0.0001	0.0029	30.4		
0.0003	0.0003	2.55		0.1943	2.74	0.0000		0.0000	0.0000	0.0002	0.0001	0.0003	0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0000	0.2935		
	0.0037	1.31			1.31	0.0001			0.0001	0.0000	0.0001	0.0001	0.0001			0.0001	0.0000	0.0000	0.0001	0.0000			0.0000		0.1182	
0.0000	0.0003	4.04		0.0005	4.04	0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.4298		
0.0004	0.0023	2.48	0.1096		2.58	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2326	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0003	0.0005	1.53	0.0118	0.0158	1.55	0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1660		
	0.0077	5.13			5.13	0.0000			0.0000			0.0000	0.0000			0.0000			0.0000	0.0000			0.0000		0.4621	
	0				0				0			0				0			0				0			
0.0010	0.0038	2.23	0.1989		2.43	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2189	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0001	0.0002	0.6822	0.0390	0.0026	0.7238	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0775		
	0.0000	0.0634	0.0123		0.0757	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0093
0.0000	0.0000	0.0776	0.0005		0.0782	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0070	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0000	0.0000	0.1070	0.0007		0.1077	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0097	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0000	0.0001	0.2752	0.0030		0.2782	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0250	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0001	0.0007	2.51	0.0067		2.51	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2262	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0013	0.0031	2.80	0.1443		2.95	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.2651	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0008	0.0001		0.0009	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0001
0.0006	0.0015	1.37	0.0707		1.44	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1299	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0014	0.0002		0.0015	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0002
0.0027	0.0066	5.92	0.3054		6.23	0.0000	0.0000		0.0000	0.0001	0.0003	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5607	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0001				0			
	0.0000	0.0069	0.0009		0.0078	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0010
0.0007	0.0023	1.98	0.0686		2.04	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1840	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0144	0.0012		0.0155	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0019
0.0021	0.0052	5.64	0.2724		5.91	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.5320	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0025	0.0003		0.0028	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0003
0.0057	0.0141	15.4	0.7458		16.2	0.0000	0.0000		0.0000	0.0002	0.0007	0.0009	0.0000	0.0000		0.0000	0.0000	0.0002	0.0003	0.0001	0.0000		0.0002		1.46	
	0				0				0	0.0002	0.0003	0.0004				0	0.0000	0.0001	0.0001				0			
	0.0000	0.0077	0.0010		0.0087	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0011
0.0038	0.0095	10.3	0.4970		10.8	0.0000	0.0000		0.0000	0.0001	0.0005	0.0006	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002	0.0001	0.0000		0.0001		0.9703	
	0				0				0	0.0001	0.0002	0.0003				0	0.0000	0.0001	0.0001				0			
	0.0000	0.0077	0.0010		0.0087	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0011
0.0030	0.0079	6.56	0.3299		6.89	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0001	0.0000		0.0001		0.6203	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0394	0.0051		0.0446	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0055
0.0000	0.0001	0.0944	0.0040		0.0984	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0089	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0002	0.0000		0.0002	0.0000	0		0.0000	0.0000	0.0000	0.0000	0.0000	0		0.0000	0.0000	0.0000	0.0000				0			0.0000
0.0021	0.0066	6.72	0.2457		6.97	0.0000	0.0000		0.0000	0.0001	0.0003	0.0004	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.6272	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0482	0.0043		0.0525	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0065
0.0000	0.0000	0.0791	0.0005		0.0796	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0072	
0.0000	0.0000	0.1086	0.0007		0.1093	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0098	
0.0001	0.0002	0.2825	0.0029		0.2855	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0257	
0.0001	0.0006	1.86	0.0036		1.86	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000		0.1677	
0.0003	0.0024	1.46	0.1108		1.57	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1415	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.1215	0.0233		0.1448	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0178
0.0004	0.0028	2.19	0.1668		2.36	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.2125	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0001	0.1784	0.0342		0.2126	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0262
0.0004	0.0030	2.17	0.1632		2.34	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.2103	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0001	0.2020	0.0393		0.2412	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0297
0.0016	0.0122	9.45	0.5897		10.0	0.0000	0.0000		0.0000	0.0001	0.0004	0.0006	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0001	0.0000		0.0001		0.9036	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0001				0			
	0.0002	0.8687	0.1405		1.01	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.1241
0.0000	0.0001	0.1451	0.0051		0.1502	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0135	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0002	0.0000		0.0002	0.0000	0		0.0000	0.0000	0.0000	0.0000	0.0000	0		0.0000	0.0000	0.0000	0.0000				0			0.0000
0.0000	0.0000	0.0274	0.0010		0.0284	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0026	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0000	0.0000		0.0000	0	0		0	0.0000	0.0000	0.0000	0	0		0	0.0000	0.0000	0.0000				0			0.0000
0.0000	0.0000	0.0368	0.0011		0.0379	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0034	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0000	0.0000		0.0001	0	0		0.0000	0.0000	0.0000	0.0000	0	0		0.0000	0.0000	0.0000	0.0000				0			0.0000
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
0.0008	0.0013	7.86	0.0526	0.0754	7.99	0.0000		0.0000	0.0000	0.0001	0.0002	0.0003	0.0000		0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0000	0.0000	0.0001	0.8529		
0.0066	0.0753	48.8	3.63		52.4	0.0011	0.0000		0.0011	0.0014	0.0031	0.0056	0.0011	0.0000		0.0011	0.0003	0.0011	0.0025	0.0005	0.0000		0.0005		4.72	
	0				0				0	0.0004	0.0004	0.0008				0	0.0001	0.0002	0.0002				0			
	0.0001	0.2396	0.0535		0.2931	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0361
0.0106	0.1164	69.7	4.65		74.4	0.0017	0.0000		0.0017	0.0021	0.0047	0.0084	0.0016	0.0000		0.0016	0.0005	0.0016	0.0038	0.0007	0.0000		0.0007		6.69	
0.0046	0.0459	25.3	2.00		27.3	0.0006	0.0000		0.0006	0.0007	0.0017	0.0031	0.0006	0.0000		0.0006	0.0002	0.0006	0.0014	0.0002	0.0000		0.0003		2.46	
0.0000	0.0006	0.4998	0.0095		0.5093	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0458	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0002	0.0014	1.02	0.0418		1.06	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0955	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0	0.0000	0.0000	0.0000		0.0000	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0		0.0000	
	0				0				0	0	0	0				0	0	0	0				0			
0.0102	0.0583	25.0	1.02		26.1	0.0002	0.0000		0.0002	0.0005	0.0016	0.0024	0.0002	0.0000		0.0002	0.0001	0.0006	0.0009	0.0002	0.0000		0.0002		2.35	
	0				0				0	0.0003	0.0004	0.0007				0	0.0001	0.0001	0.0002				0			
	0.0002	0.4817	0.0467		0.5284	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0650
0.0003	0.0059	4.28	0.0606		4.34	0.0000	0.0000		0.0000	0.0000	0.0003	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3909	
	0				0				0	0.0001	0.0003	0.0003				0	0.0000	0.0001	0.0001				0			
	0.0023	5.65	0.4074		6.05	0.0000	0.0000		0.0000	0.0002	0.0009	0.0011	0.0000	0.0000		0.0000	0.0000	0.0003	0.0004				0			0.7445
0.0003	0.0011	1.08	0.0433		1.13	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1013	
	0				0				0	0.0000	0.0000	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0221	0.0027		0.0248	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0030
0.0017	0.0070	4.86	0.2686		5.13	0.0001	0.0000		0.0001	0.0001	0.0003	0.0005	0.0001	0.0000		0.0001	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000		0.4619	
	0				0				0	0.0001	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.1054	0.0169		0.1223	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0150
0.0062	0.0222	15.2	0.9193		16.1	0.0002	0.0000		0.0002	0.0004	0.0009	0.0014	0.0002	0.0000		0.0002	0.0001	0.0003	0.0006	0.0001	0.0000		0.0002		1.45	
	0				0				0	0.0003	0.0003	0.0006				0	0.0001	0.0001	0.0002				0			
	0.0001	0.3308	0.0588		0.3896	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0479
0.0128	0.0432	21.4	1.73		23.2	0.0004	0.0000		0.0004	0.0006	0.0014	0.0024	0.0003	0.0000		0.0004	0.0001	0.0005	0.0010	0.0002	0.0000		0.0002		2.09	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0001				0			
	0.0001	0.2413	0.0565		0.2979	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0366
0.0002	0.0004	0.2372	0.0051		0.2423	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0218	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0000	0.0000	0.0279		0.0001	0.0280	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0031		
	0.0000	0.1890			0.1890	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0170	
	0				0				0	0.0002	0.0004	0.0006				0	0.0000	0.0001	0.0002				0			
0.0000	0.0000	0.0686		0.0001	0.0688	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0073		
	0.0001	1.14			1.14	0.0000			0.0000	0.0000	0.0001	0.0001	0.0000			0.0000	0.0000	0.0000	0.0000				0			0.1405

EMFAC2021 No Connector Daily VMT

Area	Sub-Area	Cal. Year	Season	Veh_Tech	EMFAC2011 Category	Population	Total_VMT	cVMT	eVMT	Trips
SACOG	All Sub-Areas	2040	Annual	All Vehicles	All Vehicles	1,975,194.8	74,561,767.9	66,168,220.8	8,393,547.1	10,019,172.8
SACOG	All Sub-Areas	2040	Annual	All Other Buses-Dsl	All Other Buses - Dsl	772.8	39,418.9	39,418.9	0	6,878.2
SACOG	All Sub-Areas	2040	Annual	All Other Buses-NG	All Other Buses - Oth	93.0	4,855.2	4,855.2	0	827.4
SACOG	All Sub-Areas	2040	Annual	LDA-Dsl	LDA - Dsl	669.3	19,974.4	19,974.4	0	2,834.9
SACOG	All Sub-Areas	2040	Annual	LDA-Elec	LDA - Oth	100,062.0	4,159,367.4	0	4,159,367.4	473,100.4
SACOG	All Sub-Areas	2040	Annual	LDA-Gas	LDA - Gas	781,873.3	30,021,263.8	30,021,263.8	0	3,610,578.0
SACOG	All Sub-Areas	2040	Annual	LDA-Phe	LDA - Gas	35,771.1	1,430,104.3	590,310.0	839,794.3	147,913.3
SACOG	All Sub-Areas	2040	Annual	LDT1-Dsl	LDT1 - Dsl	0.6303	22.7	22.7	0	2.81
SACOG	All Sub-Areas	2040	Annual	LDT1-Elec	LDT1 - Oth	1,288.4	55,400.0	0	55,400.0	6,156.9
SACOG	All Sub-Areas	2040	Annual	LDT1-Gas	LDT1 - Gas	59,881.7	2,040,364.6	2,040,364.6	0	264,280.1
SACOG	All Sub-Areas	2040	Annual	LDT1-Phe	LDT1 - Gas	985.4	41,782.3	17,038.0	24,744.3	4,074.5
SACOG	All Sub-Areas	2040	Annual	LDT2-Dsl	LDT2 - Dsl	1,793.4	67,902.1	67,902.1	0	8,261.4
SACOG	All Sub-Areas	2040	Annual	LDT2-Elec	LDT2 - Oth	15,832.9	466,414.2	0	466,414.2	75,503.6
SACOG	All Sub-Areas	2040	Annual	LDT2-Gas	LDT2 - Gas	477,643.3	17,838,723.6	17,838,723.6	0	2,185,451.0
SACOG	All Sub-Areas	2040	Annual	LDT2-Phe	LDT2 - Gas	11,417.8	459,814.6	188,722.8	271,091.8	47,212.6
SACOG	All Sub-Areas	2040	Annual	LHD1-Dsl	LHD1 - Dsl	16,776.0	536,668.8	536,668.8	0	211,021.0
SACOG	All Sub-Areas	2040	Annual	LHD1-Elec	LHD1 - Oth	12,953.7	638,886.2	0	638,886.2	181,662.1
SACOG	All Sub-Areas	2040	Annual	LHD1-Gas	LHD1 - Gas	23,036.4	769,298.0	769,298.0	0	343,208.2
SACOG	All Sub-Areas	2040	Annual	LHD2-Dsl	LHD2 - Dsl	7,814.6	246,728.6	246,728.6	0	98,297.9
SACOG	All Sub-Areas	2040	Annual	LHD2-Elec	LHD2 - Oth	3,205.7	152,786.3	0	152,786.3	42,449.2
SACOG	All Sub-Areas	2040	Annual	LHD2-Gas	LHD2 - Gas	2,741.3	90,631.8	90,631.8	0	40,841.3
SACOG	All Sub-Areas	2040	Annual	MCY-Gas	MCY - Gas	47,727.5	242,153.0	242,153.0	0	95,455.0
SACOG	All Sub-Areas	2040	Annual	MDV-Dsl	MDV - Dsl	3,564.1	115,919.7	115,919.7	0	15,774.4
SACOG	All Sub-Areas	2040	Annual	MDV-Elec	MDV - Oth	14,316.9	417,731.1	0	417,731.1	68,049.1
SACOG	All Sub-Areas	2040	Annual	MDV-Gas	MDV - Gas	277,604.7	9,698,930.9	9,698,930.9	0	1,252,535.8
SACOG	All Sub-Areas	2040	Annual	MDV-Phe	MDV - Gas	6,988.7	270,146.1	110,999.3	159,146.7	28,898.1
SACOG	All Sub-Areas	2040	Annual	MH-Dsl	MH - Dsl	1,867.3	16,158.4	16,158.4	0	186.7
SACOG	All Sub-Areas	2040	Annual	MH-Gas	MH - Gas	2,675.9	26,845.4	26,845.4	0	267.7
SACOG	All Sub-Areas	2040	Annual	Motor Coach-Dsl	Motor Coach - Dsl	140.4	17,635.2	17,635.2	0	3,227.4
SACOG	All Sub-Areas	2040	Annual	OBUS-Elec	OBUS - Oth	118.1	8,337.2	0	8,337.2	2,362.8
SACOG	All Sub-Areas	2040	Annual	OBUS-Gas	OBUS - Gas	404.0	11,651.2	11,651.2	0	8,083.3
SACOG	All Sub-Areas	2040	Annual	PTO-Dsl	PTO-Dsl	0	36,479.2	36,479.2	0	
SACOG	All Sub-Areas	2040	Annual	PTO-Elec	PTO-Oth	0	23,947.9	0	23,947.9	
SACOG	All Sub-Areas	2040	Annual	SBUS-Dsl	SBUS - Dsl	1,283.8	26,840.8	26,840.8	0	18,589.4
SACOG	All Sub-Areas	2040	Annual	SBUS-Elec	SBUS - Oth	72.8	15,724.7	0	15,724.7	7,255.1
SACOG	All Sub-Areas	2040	Annual	SBUS-Gas	SBUS - Gas	210.6	10,860.3	10,860.3	0	842.3
SACOG	All Sub-Areas	2040	Annual	SBUS-NG	SBUS-Oth	28.2	606.2	606.2	0	407.7
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 4-Dsl	T6 CAIRP small-Dsl	12.7	909.2	909.2	0	292.2
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 4-Elec	T6 CAIRP small-Oth	12.3	1,006.1	0	1,006.1	282.1
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 5-Dsl	T6 CAIRP small-Dsl	15.7	1,252.7	1,252.7	0	361.4
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 5-Elec	T6 CAIRP small-Oth	15.0	1,374.7	0	1,374.7	345.1
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 6-Dsl	T6 CAIRP small-Dsl	70.1	3,231.9	3,231.9	0	1,609.8
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 6-Elec	T6 CAIRP small-Oth	69.2	3,633.6	0	3,633.6	1,589.2
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 7-Dsl	T6 CAIRP heavy-Dsl	160.2	33,328.6	33,328.6	0	3,680.7
SACOG	All Sub-Areas	2040	Annual	T6 CAIRP Class 7-Elec	T6 CAIRP heavy-Oth	44.1	9,735.0	0	9,735.0	1,013.3
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-Dsl	T6 instate small-Dsl	917.7	30,105.7	30,105.7	0	13,095.2
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-Elec	T6 instate small-Oth	649.0	24,025.3	0	24,025.3	9,261.6
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 4-NG	T6 instate small-NG	0.4608	15.3	15.3	0	6.58
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-Dsl	T6 instate small-Dsl	455.5	14,903.8	14,903.8	0	6,499.9
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-Elec	T6 instate small-Oth	318.1	11,759.0	0	11,759.0	4,538.9
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 5-NG	T6 instate small-NG	0.7522	25.1	25.1	0	10.7
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-Dsl	T6 instate small-Dsl	2,006.8	65,681.1	65,681.1	0	28,637.4
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-Elec	T6 instate small-Oth	1,398.6	51,674.1	0	51,674.1	19,958.1
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 6-NG	T6 instate small-NG	3.77	126.8	126.8	0	53.8
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-Dsl	T6 instate heavy-Dsl	470.9	23,475.9	23,475.9	0	6,719.7
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-Elec	T6 instate heavy-Oth	186.9	9,958.2	0	9,958.2	2,667.2
SACOG	All Sub-Areas	2040	Annual	T6 Instate Delivery Class 7-NG	T6 instate heavy-NG	2.89	142.7	142.7	0	41.2
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-Dsl	T6 instate small-Dsl	1,813.5	70,527.3	70,527.3	0	20,963.6
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-Elec	T6 instate small-Oth	1,269.6	58,345.3	0	58,345.3	14,676.9
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 4-NG	T6 instate small-NG	1.26	51.8	51.8	0	14.6
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-Dsl	T6 instate small-Dsl	5,095.7	197,630.6	197,630.6	0	58,906.6
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-Elec	T6 instate small-Oth	3,525.2	162,930.7	0	162,930.7	40,751.8
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 5-NG	T6 instate small-NG	3.92	162.0	162.0	0	45.3
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-Dsl	T6 instate small-Dsl	3,250.7	126,211.5	126,211.5	0	37,578.0
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-Elec	T6 instate small-Oth	2,257.1	104,022.1	0	104,022.1	26,092.1
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 6-NG	T6 instate small-NG	3.87	161.9	161.9	0	44.7
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-Dsl	T6 instate heavy-Dsl	2,129.3	82,865.0	82,865.0	0	24,614.4
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-Elec	T6 instate heavy-Oth	797.4	48,242.3	0	48,242.3	9,218.2
SACOG	All Sub-Areas	2040	Annual	T6 Instate Other Class 7-NG	T6 instate heavy-NG	12.0	455.5	455.5	0	138.4
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-Dsl	T6 instate small-Dsl	31.4	1,413.4	1,413.4	0	363.3
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-Elec	T6 instate small-Oth	21.2	1,240.7	0	1,240.7	245.6
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 6-NG	T6 instate small-NG	0.0697	3.21	3.21	0	0.8062
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-Dsl	T6 instate heavy-Dsl	1,503.5	85,401.8	85,401.8	0	17,380.6
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-Elec	T6 instate heavy-Oth	226.5	17,043.3	0	17,043.3	2,618.5
SACOG	All Sub-Areas	2040	Annual	T6 Instate Tractor Class 7-NG	T6 instate heavy-NG	10.2	564.6	564.6	0	117.7
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 4-Dsl	T6 OOS small-Dsl	13.3	1,001.3	1,001.3	0	304.8
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 5-Dsl	T6 OOS small-Dsl	16.4	1,373.6	1,373.6	0	375.8
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 6-Dsl	T6 OOS small-Dsl	73.4	3,589.4	3,589.4	0	1,686.9
SACOG	All Sub-Areas	2040	Annual	T6 OOS Class 7-Dsl	T6 OOS heavy-Dsl	91.4	26,099.3	26,099.3	0	2,101.5
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-Dsl	T6 Public-Dsl	435.2	14,943.9	14,943.9	0	2,232.4
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-Elec	T6 Public-Oth	221.9	9,139.4	0	9,139.4	1,138.3
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 4-NG	T6 Public-NG	36.4	1,275.3	1,275.3	0	186.9
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-Dsl	T6 Public-Dsl	682.6	23,405.9	23,405.9	0	3,502.0
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-Elec	T6 Public-Oth	343.9	14,154.5	0	14,154.5	1,764.2
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 5-NG	T6 Public-NG	54.2	1,855.4	1,855.4	0	278.0
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-Dsl	T6 Public-Dsl	601.9	20,762.8	20,762.8	0	3,087.6
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-Elec	T6 Public-Oth	315.3	12,893.9	0	12,893.9	1,617.7
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 6-NG	T6 Public-NG	61.0	2,110.9	2,110.9	0	312.8
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-Dsl	T6 Public-Dsl	2,228.3	92,284.0	92,284.0	0	11,431.3
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-Elec	T6 Public-Oth	981.6	50,916.8	0	50,916.8	5,035.6
SACOG	All Sub-Areas	2040	Annual	T6 Public Class 7-NG	T6 Public-NG	218.5	9,115.6	9,115.6	0	1,120.8
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-Dsl	T6 Utility-Dsl	51.8	2,037.3	2,037.3	0	663.5
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-Elec	T6 Utility-Oth	52.9	2,218.8	0	2,218.8	677.3
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 5-NG	T6 Utility-NG	0.0561	2.21	2.21	0	0.7176
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-Dsl	T6 Utility-Dsl	9.80	385.1	385.1	0	125.4
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-Elec	T6 Utility-Oth	10.00	419.2	0	419.2	128.0
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 6-NG	T6 Utility-NG	0.0107	0.4185	0.4185	0	0.1363
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-Dsl	T6 Utility-Dsl	10.8	516.8	516.8	0	138.7
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-Elec	T6 Utility-Oth	11.1	602.3	0	602.3	142.5
SACOG	All Sub-Areas	2040	Annual	T6 Utility Class 7-NG	T6 Utility-NG	0.0118	0.5613	0.5613	0	0.1509
SACOG	All Sub-Areas	2040	Annual	T6TS-Elec	T6TS - Gas	669.5	46,589.9	0	46,589.9	13,395.3
SACOG	All Sub-Areas	2040	Annual	T6TS-Gas	T6TS - Gas	1,474.7	63,184.7	63,184.7	0	29,504.9
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-Dsl	T7 CAIRP-Dsl	2,628.2	555,532.5	555,532.5	0	60,396.8
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-Elec	T7 CAIRP-Oth	690.5	153,031.2	0	153,031.2	15,867.9
SACOG	All Sub-Areas	2040	Annual	T7 CAIRP Class 8-NG	T7 CAIRP-NG	11.5	2,410.6	2,410.6	0	263.7
SACOG	All Sub-Areas	2040	Annual	T7 NNOOS Class 8-Dsl	T7 NNOOS-Dsl	2,845.0	833,156.3	833,156.3	0	65,378.6
SACOG	All Sub-Areas	2040	Annual	T7 NOOS Class 8-Dsl	T7 NOOS-Dsl	1,228.2	302,900.3	302,900.3	0	28,224.9
SACOG	All Sub-Areas	2040	Annual	T7 Other Port Class 8-Dsl	T7 Other Port-Dsl	19.6	4,911.0	4,911.0	0	320.3
SACOG	All Sub-Areas	2040	Annual	T7 Other Port Class 8-Elec	T7 Other Port-Oth	4.05	1,161.9	0	1,161.9	66.3
SACOG	All Sub-Areas	2040	Annual	T7 POAK Class 8-Dsl	T7 POAK-Dsl	102.2	11,903.1	11,903.1	0	1,671.6
SACOG	All Sub-Areas	2040	Annual	T7 POAK Class 8-Elec	T7 POAK-Oth	20.3	2,332.7	0	2,332.7	332.3
SACOG	All Sub-Areas	2040	Annual	T7 POLA Class 8-Dsl	T7 POLA-Dsl	0.0000	0.0011	0.0011	0	0.0001
SACOG	All Sub-Areas	2040	Annual	T7 POLA Class 8-Elec	T7 POLA-Oth	0.0000	0.0001	0	0.0001	0.0000
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-Dsl	T7 Public-Dsl	4,139.4	165,593.6	165,593.6	0	21,235.4
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-Elec	T7 Public-Oth	1,534.0	79,169.3	0	79,169.3	7,869.3
SACOG	All Sub-Areas	2040	Annual	T7 Public Class 8-NG	T7 Public-NG	85.3	3,448.7	3,448.7	0	437.5
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-Dsl	T7 SWCV-Dsl	302.6	19,622.9	19,622.9	0	1,392.2
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-Elec	T7 SWCV-Oth	427.8	27,679.8	0	27,679.8	1,968.0
SACOG	All Sub-Areas	2040	Annual	T7 SWCV Class 8-NG	T7 SWCV-NG	685.0	44,406.8	44,406.8	0	3,151.0
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-Dsl	T7 Single-Dsl	127.6	8,123.5	8,123.5	0	1,201.9
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-Elec	Single Concrete/Transit Mix	116.1	8,647.7	0	8,647.7	1,093.3
SACOG	All Sub-Areas	2040	Annual	T7 Single Concrete/Transit Mix Class 8-NG	T7 Single-NG	3.42	218.8	218.8	0	32.3
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-Dsl	T7 Single-Dsl	924.5	44,810.4	44,810.4	0	8,708.9
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-Elec	T7 Single Dump-Oth	369.0	25,847.1	0	25,847.1	3,476.4
SACOG	All Sub-Areas	2040	Annual	T7 Single Dump Class 8-NG	T7 Single-NG	26.0	1,228.5	1,228.5	0	244.5
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-Dsl	T7 Single-Dsl	2,953.5	125,646.9	125,646.9	0	27,822.4
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-Elec	T7 Single Other-Oth	1,438.3	86,111.5	0	86,111.5	13,548.7
SACOG	All Sub-Areas	2040	Annual	T7 Single Other Class 8-NG	T7 Single-NG	86.7	3,688.5	3,688.5	0	816.6
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-Dsl	T7 Tractor-Dsl	3,554.6	230,441.8	230,441.8	0	51,648.1
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-Elec	T7 Tractor-Oth	512.9	38,696.4	0	38,696.4	7,452.2
SACOG	All Sub-Areas	2040	Annual	T7 Tractor Class 8-NG	T7 Tractor-NG	67.2	4,204.7	4,204.7	0	975.9
SACOG	All Sub-Areas	2040	Annual	T7 Utility Class 8-Dsl	T7 Utility-Dsl	52.9	2,166.5	2,166.5	0	677.7
SACOG	All Sub-Areas	2040	Annual	T7 Utility Class 8-Elec	T7 Utility-Oth	23.2	1,195.9	0	1,195.9	296.8
SACOG	All Sub-Areas	2040	Annual	T7IS-Elec	T7IS - Gas	0.8136	144.2	0	144.2	16.3
SACOG	All Sub-Areas	2040	Annual	T7IS-Gas	T7IS - Gas	1.79	202.2	202.2	0	35.9
SACOG	All Sub-Areas	2040	Annual	UBUS-Dsl	UBUS - Dsl	32.1	3,200.0	3,200.0	0	128.5
SACOG	All Sub-Areas	2040	Annual	UBUS-Elec	UBUS - Oth	1,017.9	94,232.1	0	94,232.1	4,071.5
SACOG	All Sub-Areas	2040	Annual	UBUS-Gas	UBUS - Gas	21.9	1,393.3	1,393.3	0	87.8
SACOG	All Sub-Areas	2040	Annual	UBUS-NG	UBUS - NG	95.9	9,415.0	9,415.0	0	383.6

Veh_Tech	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_TOTEX	TOG_DIURN	TOG_HTSK	TOG_RUNLS	TOG_TOTAL	ROG_RUNEX	ROG_IDLEX	ROG_STREX
All Vehicles	1.03	0.1861	1.81	3.02	2.69	0.8314	2.20	8.75	0.6879	0.1389	1.65
All Other Buses-Dsl	0.0030	0.0001		0.0031				0.0031	0.0027	0.0001	
All Other Buses-NG	0.0045	0.0004		0.0049				0.0049	0.0001	0.0000	
LDA-Dsl	0.0002			0.0002				0.0002	0.0002		
LDA-Elec				0				0			
LDA-Gas	0.1632		0.6536	0.8168	0.9749	0.1893	0.6951	2.68	0.1118		0.5970
LDA-Phe	0.0030		0.0308	0.0338	0.0325	0.0066	0.0134	0.0863	0.0021		0.0281
LDT1-Dsl	0.0000			0.0000				0.0000	0.0000		
LDT1-Elec				0				0			
LDT1-Gas	0.0159		0.0629	0.0788	0.1356	0.0243	0.0942	0.3329	0.0109		0.0574
LDT1-Phe	0.0001		0.0008	0.0009	0.0005	0.0001	0.0002	0.0017	0.0001		0.0008
LDT2-Dsl	0.0013			0.0013				0.0013	0.0011		
LDT2-Elec				0				0			
LDT2-Gas	0.1336		0.5046	0.6382	0.6951	0.1274	0.5069	1.97	0.0916		0.4609
LDT2-Phe	0.0010		0.0098	0.0108	0.0079	0.0017	0.0030	0.0235	0.0007		0.0090
LHD1-Dsl	0.0798	0.0023		0.0822				0.0822	0.0701	0.0020	
LHD1-Elec				0				0			
LHD1-Gas	0.0066	0.0122	0.0473	0.0661	0.0717	0.0118	0.0914	0.2410	0.0045	0.0083	0.0432
LHD2-Dsl	0.0397	0.0011		0.0408				0.0408	0.0349	0.0009	
LHD2-Elec				0				0			
LHD2-Gas	0.0007	0.0013	0.0048	0.0068	0.0089	0.0014	0.0114	0.0285	0.0005	0.0009	0.0044
MCY-Gas	0.3046		0.1283	0.4330	0.2578	0.3765	0.4222	1.49	0.2466		0.1179
MDV-Dsl	0.0010			0.0010				0.0010	0.0009		
MDV-Elec				0				0			
MDV-Gas	0.0866		0.3481	0.4348	0.4878	0.0885	0.3463	1.36	0.0594		0.3180
MDV-Phe	0.0006		0.0060	0.0066	0.0055	0.0011	0.0022	0.0154	0.0004		0.0055
MH-Dsl	0.0021			0.0021				0.0021	0.0018		
MH-Gas	0.0005		0.0000	0.0006	0.0089	0.0015	0.0000	0.0111	0.0004		0.0000
Motor Coach-Dsl	0.0002	0.0007		0.0009				0.0009	0.0002	0.0006	
OBUS-Elec				0				0			
OBUS-Gas	0.0007	0.0005	0.0018	0.0030	0.0020	0.0003	0.0021	0.0075	0.0005	0.0003	0.0016
PTO-Dsl	0.0007			0.0007				0.0007	0.0006		
PTO-Elec				0				0			
SBUS-Dsl	0.0007	0.0003		0.0009				0.0009	0.0006	0.0002	
SBUS-Elec				0				0			
SBUS-Gas	0.0001	0.0036	0.0004	0.0041	0.0010	0.0001	0.0006	0.0059	0.0001	0.0025	0.0004
SBUS-NG	0.0015	0.0004		0.0018				0.0018	0.0000	0.0000	
T6 CAIRP Class 4-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 CAIRP Class 4-Elec				0				0			
T6 CAIRP Class 5-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 CAIRP Class 5-Elec				0				0			
T6 CAIRP Class 6-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 CAIRP Class 6-Elec				0				0			
T6 CAIRP Class 7-Dsl	0.0002	0.0000		0.0003				0.0003	0.0002	0.0000	
T6 CAIRP Class 7-Elec				0				0			
T6 Instate Delivery Class 4-Dsl	0.0003	0.0002		0.0005				0.0005	0.0002	0.0002	
T6 Instate Delivery Class 4-Elec				0				0			
T6 Instate Delivery Class 4-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 Instate Delivery Class 5-Dsl	0.0001	0.0001		0.0002				0.0002	0.0001	0.0001	
T6 Instate Delivery Class 5-Elec				0				0			
T6 Instate Delivery Class 5-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 Instate Delivery Class 6-Dsl	0.0005	0.0004		0.0010				0.0010	0.0005	0.0004	
T6 Instate Delivery Class 6-Elec				0				0			
T6 Instate Delivery Class 6-NG	0.0001	0.0000		0.0002				0.0002	0.0000	0.0000	
T6 Instate Delivery Class 7-Dsl	0.0003	0.0001		0.0004				0.0004	0.0002	0.0001	
T6 Instate Delivery Class 7-Elec				0				0			
T6 Instate Delivery Class 7-NG	0.0001	0.0000		0.0002				0.0002	0.0000	0.0000	
T6 Instate Other Class 4-Dsl	0.0006	0.0004		0.0010				0.0010	0.0005	0.0004	
T6 Instate Other Class 4-Elec				0				0			
T6 Instate Other Class 4-NG	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000	
T6 Instate Other Class 5-Dsl	0.0014	0.0011		0.0026				0.0026	0.0012	0.0010	
T6 Instate Other Class 5-Elec				0				0			
T6 Instate Other Class 5-NG	0.0001	0.0001		0.0002				0.0002	0.0000	0.0000	
T6 Instate Other Class 6-Dsl	0.0009	0.0007		0.0017				0.0017	0.0008	0.0006	
T6 Instate Other Class 6-Elec				0				0			
T6 Instate Other Class 6-NG	0.0001	0.0001		0.0002				0.0002	0.0000	0.0000	
T6 Instate Other Class 7-Dsl	0.0008	0.0005		0.0013				0.0013	0.0007	0.0004	
T6 Instate Other Class 7-Elec				0				0			
T6 Instate Other Class 7-NG	0.0003	0.0002		0.0005				0.0005	0.0000	0.0000	
T6 Instate Tractor Class 6-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 Instate Tractor Class 6-Elec				0				0			
T6 Instate Tractor Class 6-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 Instate Tractor Class 7-Dsl	0.0007	0.0003		0.0011				0.0011	0.0007	0.0003	
T6 Instate Tractor Class 7-Elec				0				0			
T6 Instate Tractor Class 7-NG	0.0004	0.0002		0.0006				0.0006	0.0000	0.0000	
T6 OOS Class 4-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 OOS Class 5-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 OOS Class 6-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 OOS Class 7-Dsl	0.0002	0.0000		0.0002				0.0002	0.0002	0.0000	
T6 Public Class 4-Dsl	0.0004	0.0001		0.0005				0.0005	0.0003	0.0001	
T6 Public Class 4-Elec				0				0			
T6 Public Class 4-NG	0.0013	0.0007		0.0020				0.0020	0.0000	0.0000	
T6 Public Class 5-Dsl	0.0004	0.0002		0.0007				0.0007	0.0004	0.0002	
T6 Public Class 5-Elec				0				0			
T6 Public Class 5-NG	0.0018	0.0012		0.0030				0.0030	0.0000	0.0000	
T6 Public Class 6-Dsl	0.0004	0.0002		0.0006				0.0006	0.0003	0.0002	
T6 Public Class 6-Elec				0				0			
T6 Public Class 6-NG	0.0021	0.0012		0.0033				0.0033	0.0000	0.0000	
T6 Public Class 7-Dsl	0.0017	0.0007		0.0025				0.0025	0.0015	0.0006	
T6 Public Class 7-Elec				0				0			
T6 Public Class 7-NG	0.0090	0.0044		0.0135				0.0135	0.0001	0.0001	
T6 Utility Class 5-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 Utility Class 5-Elec				0				0			
T6 Utility Class 5-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 Utility Class 6-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 Utility Class 6-Elec				0				0			
T6 Utility Class 6-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 Utility Class 7-Dsl	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6 Utility Class 7-Elec				0				0			
T6 Utility Class 7-NG	0.0000	0.0000		0.0000				0.0000	0.0000	0.0000	
T6TS-Elec				0				0			
T6TS-Gas	0.0015	0.0024	0.0069	0.0109	0.0042	0.0006	0.0077	0.0235	0.0010	0.0017	0.0063
T7 CAIRP Class 8-Dsl	0.0080	0.0344		0.0424				0.0424	0.0070	0.0302	
T7 CAIRP Class 8-Elec				0				0			
T7 CAIRP Class 8-NG	0.0025	0.0019		0.0044				0.0044	0.0000	0.0000	
T7 NNOOS Class 8-Dsl	0.0116	0.0462		0.0578				0.0578	0.0102	0.0406	
T7 NOOS Class 8-Dsl	0.0044	0.0200		0.0243				0.0243	0.0038	0.0175	
T7 Other Port Class 8-Dsl	0.0001	0.0001		0.0001				0.0001	0.0001	0.0001	
T7 Other Port Class 8-Elec				0				0			
T7 POAK Class 8-Dsl	0.0002	0.0004		0.0006				0.0006	0.0001	0.0004	
T7 POAK Class 8-Elec				0				0			
T7 POLA Class 8-Dsl	0	0		0				0	0	0	
T7 POLA Class 8-Elec				0				0			
T7 Public Class 8-Dsl	0.0083	0.0060		0.0143				0.0143	0.0073	0.0053	
T7 Public Class 8-Elec				0				0			
T7 Public Class 8-NG	0.0067	0.0017		0.0084				0.0084	0.0001	0.0000	
T7 SWCV Class 8-Dsl	0.0006	0.0005		0.0011				0.0011	0.0005	0.0004	
T7 SWCV Class 8-Elec				0				0			
T7 SWCV Class 8-NG	0.0492	0.0039		0.0532				0.0532	0.0011	0.0001	
T7 Single Concrete/Transit Mix Class 8-Dsl	0.0001	0.0003		0.0004				0.0004	0.0001	0.0003	
T7 Single Concrete/Transit Mix Class 8-Elec				0				0			
T7 Single Concrete/Transit Mix Class 8-NG	0.0003	0.0001		0.0004				0.0004	0.0000	0.0000	
T7 Single Dump Class 8-Dsl	0.0006	0.0022		0.0028				0.0028	0.0006	0.0019	
T7 Single Dump Class 8-Elec				0				0			
T7 Single Dump Class 8-NG	0.0015	0.0008		0.0023				0.0023	0.0000	0.0000	
T7 Single Other Class 8-Dsl	0.0016	0.0069		0.0085				0.0085	0.0014	0.0061	
T7 Single Other Class 8-Elec				0				0			
T7 Single Other Class 8-NG	0.0044	0.0027		0.0071				0.0071	0.0001	0.0000	
T7 Tractor Class 8-Dsl	0.0030	0.0154		0.0184				0.0184	0.0026	0.0135	
T7 Tractor Class 8-Elec				0				0			
T7 Tractor Class 8-NG	0.0048	0.0038		0.0086				0.0086	0.0001	0.0001	
T7 Utility Class 8-Dsl	0.0000	0.0000		0.0001				0.0001	0.0000	0.0000	
T7 Utility Class 8-Elec				0				0			
T7IS-Elec				0				0			
T7IS-Gas	0.0002		0.0000	0.0002	0.0000	0.0000	0.0000	0.0002	0.0001		0.0000
UBUS-Dsl	0.0002			0.0002				0.0002	0.0002		
UBUS-Elec				0				0			
UBUS-Gas	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
UBUS-NG	0.0452			0.0452				0.0452	0.0007		

Veh_Tech	ROG_TOTEX	ROG_DIURN	ROG_HTSK	ROG_RUNLS	ROG_TOTAL	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	NOx_RUNEX	NOx_IDLEX
All Vehicles	2.48	2.69	0.8314	2.20	8.20	44.8	2.19	19.5	66.4	6.67	1.75
All Other Buses-Dsl	0.0027				0.0027	0.0089	0.0018		0.0107	0.0487	0.0019
All Other Buses-NG	0.0001				0.0001	0.0179	0.0009		0.0188	0.0007	0.0002
LDA-Dsl	0.0002				0.0002	0.0043			0.0043	0.0011	
LDA-Elec	0				0				0		
LDA-Gas	0.7088	0.9749	0.1893	0.6951	2.57	17.8		7.29	25.1	0.7023	
LDA-Phe	0.0301	0.0325	0.0066	0.0134	0.0827	0.3116		0.2165	0.5281	0.0045	
LDT1-Dsl	0.0000				0.0000	0.0000			0.0000	0.0000	
LDT1-Elec	0				0				0		
LDT1-Gas	0.0683	0.1356	0.0243	0.0942	0.3224	1.40		0.6298	2.03	0.0626	
LDT1-Phe	0.0008	0.0005	0.0001	0.0002	0.0016	0.0090		0.0060	0.0150	0.0001	
LDT2-Dsl	0.0011				0.0011	0.0118			0.0118	0.0023	
LDT2-Elec	0				0				0		
LDT2-Gas	0.5525	0.6951	0.1274	0.5069	1.88	12.4		5.49	17.9	0.5047	
LDT2-Phe	0.0096	0.0079	0.0017	0.0030	0.0223	0.0997		0.0692	0.1689	0.0014	
LHD1-Dsl	0.0722				0.0722	0.1937	0.0168		0.2105	0.4067	0.0265
LHD1-Elec	0				0				0		
LHD1-Gas	0.0561	0.0717	0.0118	0.0914	0.2310	0.4990	0.0960	1.19	1.79	0.0327	0.0007
LHD2-Dsl	0.0358				0.0358	0.0964	0.0078		0.1042	0.2020	0.0123
LHD2-Elec	0				0				0		
LHD2-Gas	0.0057	0.0089	0.0014	0.0114	0.0274	0.0602	0.0114	0.1462	0.2179	0.0033	0.0001
MCY-Gas	0.3646	0.2578	0.3765	0.4222	1.42	3.01		0.8595	3.87	0.1363	
MDV-Dsl	0.0009				0.0009	0.0249			0.0249	0.0022	
MDV-Elec	0				0				0		
MDV-Gas	0.3773	0.4878	0.0885	0.3463	1.30	7.20		3.36	10.6	0.3428	
MDV-Phe	0.0059	0.0055	0.0011	0.0022	0.0147	0.0586		0.0423	0.1010	0.0009	
MH-Dsl	0.0018				0.0018	0.0058			0.0058	0.0559	
MH-Gas	0.0004	0.0089	0.0015	0.0000	0.0109	0.0054		0.0008	0.0062	0.0036	
Motor Coach-Dsl	0.0008				0.0008	0.0007	0.0091		0.0099	0.0194	0.0037
OBUS-Elec	0				0				0		
OBUS-Gas	0.0025	0.0020	0.0003	0.0021	0.0070	0.0111	0.0026	0.0329	0.0466	0.0036	0.0000
PTO-Dsl	0.0006				0.0006	0.0076			0.0076	0.1068	
PTO-Elec	0				0				0		
SBUS-Dsl	0.0008				0.0008	0.0025	0.0093		0.0119	0.0244	0.0157
SBUS-Elec	0				0				0		
SBUS-Gas	0.0029	0.0010	0.0001	0.0006	0.0047	0.0023	0.0191	0.0079	0.0293	0.0017	0.0002
SBUS-NG	0.0000				0.0000	0.0038	0.0012		0.0050	0.0001	0.0002
T6 CAIRP Class 4-Dsl	0.0000				0.0000	0.0000	0.0000		0.0001	0.0002	0.0000
T6 CAIRP Class 4-Elec	0				0				0		
T6 CAIRP Class 5-Dsl	0.0000				0.0000	0.0000	0.0000		0.0001	0.0003	0.0000
T6 CAIRP Class 5-Elec	0				0				0		
T6 CAIRP Class 6-Dsl	0.0000				0.0000	0.0001	0.0002		0.0003	0.0007	0.0002
T6 CAIRP Class 6-Elec	0				0				0		
T6 CAIRP Class 7-Dsl	0.0002				0.0002	0.0011	0.0004		0.0015	0.0073	0.0005
T6 CAIRP Class 7-Elec	0				0				0		
T6 Instate Delivery Class 4-Dsl	0.0004				0.0004	0.0019	0.0071		0.0090	0.0136	0.0098
T6 Instate Delivery Class 4-Elec	0				0				0		
T6 Instate Delivery Class 4-NG	0.0000				0.0000	0.0001	0.0000		0.0001	0.0000	0.0000
T6 Instate Delivery Class 5-Dsl	0.0002				0.0002	0.0009	0.0035		0.0045	0.0066	0.0048
T6 Instate Delivery Class 5-Elec	0				0				0		
T6 Instate Delivery Class 5-NG	0.0000				0.0000	0.0001	0.0000		0.0001	0.0000	0.0000
T6 Instate Delivery Class 6-Dsl	0.0008				0.0008	0.0040	0.0156		0.0196	0.0291	0.0214
T6 Instate Delivery Class 6-Elec	0				0				0		
T6 Instate Delivery Class 6-NG	0.0000				0.0000	0.0005	0.0002		0.0007	0.0000	0.0000
T6 Instate Delivery Class 7-Dsl	0.0003				0.0003	0.0019	0.0036		0.0056	0.0184	0.0050
T6 Instate Delivery Class 7-Elec	0				0				0		
T6 Instate Delivery Class 7-NG	0.0000				0.0000	0.0006	0.0001		0.0006	0.0000	0.0000
T6 Instate Other Class 4-Dsl	0.0009				0.0009	0.0035	0.0152		0.0187	0.0242	0.0208
T6 Instate Other Class 4-Elec	0				0				0		
T6 Instate Other Class 4-NG	0.0000				0.0000	0.0002	0.0001		0.0002	0.0000	0.0000
T6 Instate Other Class 5-Dsl	0.0022				0.0022	0.0094	0.0425		0.0519	0.0636	0.0582
T6 Instate Other Class 5-Elec	0				0				0		
T6 Instate Other Class 5-NG	0.0000				0.0000	0.0005	0.0002		0.0007	0.0000	0.0000
T6 Instate Other Class 6-Dsl	0.0015				0.0015	0.0061	0.0271		0.0333	0.0416	0.0372
T6 Instate Other Class 6-Elec	0				0				0		
T6 Instate Other Class 6-NG	0.0000				0.0000	0.0005	0.0002		0.0006	0.0000	0.0000
T6 Instate Other Class 7-Dsl	0.0011				0.0011	0.0050	0.0177		0.0227	0.0471	0.0246
T6 Instate Other Class 7-Elec	0				0				0		
T6 Instate Other Class 7-NG	0.0000				0.0000	0.0014	0.0004		0.0018	0.0001	0.0001
T6 Instate Tractor Class 6-Dsl	0.0000				0.0000	0.0001	0.0003		0.0003	0.0005	0.0004
T6 Instate Tractor Class 6-Elec	0				0				0		
T6 Instate Tractor Class 6-NG	0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
T6 Instate Tractor Class 7-Dsl	0.0010				0.0010	0.0049	0.0125		0.0174	0.0425	0.0173
T6 Instate Tractor Class 7-Elec	0				0				0		
T6 Instate Tractor Class 7-NG	0.0000				0.0000	0.0017	0.0003		0.0020	0.0001	0.0001
T6 OOS Class 4-Dsl	0.0000				0.0000	0.0000	0.0000		0.0001	0.0003	0.0000
T6 OOS Class 5-Dsl	0.0000				0.0000	0.0000	0.0000		0.0001	0.0004	0.0001
T6 OOS Class 6-Dsl	0.0000				0.0000	0.0001	0.0002		0.0003	0.0009	0.0002
T6 OOS Class 7-Dsl	0.0002				0.0002	0.0008	0.0002		0.0010	0.0067	0.0003
T6 Public Class 4-Dsl	0.0005				0.0005	0.0012	0.0048		0.0060	0.0163	0.0094
T6 Public Class 4-Elec	0				0				0		
T6 Public Class 4-NG	0.0000				0.0000	0.0043	0.0022		0.0065	0.0001	0.0003
T6 Public Class 5-Dsl	0.0006				0.0006	0.0017	0.0079		0.0096	0.0179	0.0129
T6 Public Class 5-Elec	0				0				0		
T6 Public Class 5-NG	0.0000				0.0000	0.0063	0.0031		0.0093	0.0002	0.0005
T6 Public Class 6-Dsl	0.0005				0.0005	0.0015	0.0069		0.0084	0.0178	0.0116
T6 Public Class 6-Elec	0				0				0		
T6 Public Class 6-NG	0.0000				0.0000	0.0071	0.0038		0.0109	0.0002	0.0005
T6 Public Class 7-Dsl	0.0022				0.0022	0.0064	0.0256		0.0320	0.0801	0.0425
T6 Public Class 7-Elec	0				0				0		
T6 Public Class 7-NG	0.0002				0.0002	0.0307	0.0136		0.0443	0.0006	0.0019
T6 Utility Class 5-Dsl	0.0000				0.0000	0.0001	0.0003		0.0004	0.0005	0.0004
T6 Utility Class 5-Elec	0				0				0		
T6 Utility Class 5-NG	0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
T6 Utility Class 6-Dsl	0.0000				0.0000	0.0000	0.0001		0.0001	0.0001	0.0001
T6 Utility Class 6-Elec	0				0				0		
T6 Utility Class 6-NG	0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
T6 Utility Class 7-Dsl	0.0000				0.0000	0.0000	0.0001		0.0001	0.0001	0.0001
T6 Utility Class 7-Elec	0				0				0		
T6 Utility Class 7-NG	0.0000				0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
T6TS-Elec	0				0				0		
T6TS-Gas	0.0091	0.0042	0.0006	0.0077	0.0216	0.0175	0.0249	0.1187	0.1610	0.0070	0.0001
T7 CAIRP Class 8-Dsl	0.0372				0.0372	0.0238	0.4467		0.4704	0.7421	0.3572
T7 CAIRP Class 8-Elec	0				0				0		
T7 CAIRP Class 8-NG	0.0001				0.0001	0.0077	0.0061		0.0137	0.0004	0.0008
T7 NNOOS Class 8-Dsl	0.0508				0.0508	0.0346	0.6001		0.6347	1.22	0.4799
T7 NOOS Class 8-Dsl	0.0214				0.0214	0.0130	0.2591		0.2720	0.4567	0.2072
T7 Other Port Class 8-Dsl	0.0001				0.0001	0.0003	0.0011		0.0014	0.0067	0.0009
T7 Other Port Class 8-Elec	0				0				0		
T7 POAK Class 8-Dsl	0.0005				0.0005	0.0009	0.0057		0.0065	0.0171	0.0046
T7 POAK Class 8-Elec	0				0				0		
T7 POLA Class 8-Dsl	0				0	0	0.0000		0.0000	0.0000	0.0000
T7 POLA Class 8-Elec	0				0				0		
T7 Public Class 8-Dsl	0.0126				0.0126	0.0321	0.0736		0.1056	0.4877	0.0856
T7 Public Class 8-Elec	0				0				0		
T7 Public Class 8-NG	0.0001				0.0001	0.0319	0.0048		0.0367	0.0012	0.0007
T7 SWCV Class 8-Dsl	0.0010				0.0010	0.0013	0.0054		0.0067	0.0682	0.0088
T7 SWCV Class 8-Elec	0				0				0		
T7 SWCV Class 8-NG	0.0011				0.0011	0.5731	0.0306		0.6037	0.0244	0.0013
T7 Single Concrete/Transit Mix Class 8-Dsl	0.0003				0.0003	0.0004	0.0039		0.0043	0.0075	0.0031
T7 Single Concrete/Transit Mix Class 8-Elec	0				0				0		
T7 Single Concrete/Transit Mix Class 8-NG	0.0000				0.0000	0.0010	0.0003		0.0013	0.0000	0.0000
T7 Single Dump Class 8-Dsl	0.0025				0.0025	0.0030	0.0280		0.0310	0.0585	0.0225
T7 Single Dump Class 8-Elec	0				0				0		
T7 Single Dump Class 8-NG	0.0000				0.0000	0.0068	0.0021		0.0090	0.0003	0.0003
T7 Single Other Class 8-Dsl	0.0075				0.0075	0.0074	0.0895		0.0969	0.1472	0.0718
T7 Single Other Class 8-Elec	0				0				0		
T7 Single Other Class 8-NG	0.0001				0.0001	0.0186	0.0076		0.0262	0.0008	0.0011
T7 Tractor Class 8-Dsl	0.0162				0.0162	0.0126	0.2000		0.2126	0.3084	0.1601
T7 Tractor Class 8-Elec	0				0				0		
T7 Tractor Class 8-NG	0.0001				0.0001	0.0183	0.0112		0.0295	0.0009	0.0016
T7 Utility Class 8-Dsl	0.0001				0.0001	0.0002	0.0005		0.0008	0.0026	0.0004
T7 Utility Class 8-Elec	0				0				0		
T7IS-Elec	0				0				0		
T7IS-Gas	0.0001	0.0000	0.0000	0.0000	0.0001	0.0069		0.0002	0.0071	0.0005	
UBUS-Dsl	0.0002				0.0002	0.0002			0.0002	0.0009	
UBUS-Elec	0				0				0		
UBUS-Gas	0.0000	0.0000	0.0000	0.0000	0.0000	0.0009		0.0006	0.0015	0.0000	
UBUS-NG	0.0007				0.0007	0.5246			0.5246	0.0007	

EMFAC2021 No Connector Daily VMT

NOx_STREX	NOx_TOTEX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CO2_TOTEX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_TOTEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_TOTEX	PM2_5_PMTW	PM2_5_PMBW	PM2_5_TOTAL	SOx_RUNEX	SOx_IDLEX	SOx_STREX	SOx_TOTEX	Fuel_GAS	Fuel_DSL	Fuel_NG
3.09	11.5	24,861.8	297.2	537.1	25,696.1	0.1419	0.0014	0.0091	0.1524	0.7557	1.14	2.05	0.1342	0.0013	0.0084	0.1439	0.1889	0.3998	0.7326	0.2454	0.0027	0.0057	0.2539	2,149.3	493.9	15.6
0.0070	0.0576	44.4	0.4642		44.9	0.0008	0.0000		0.0008	0.0005	0.0020	0.0033	0.0008	0.0000		0.0008	0.0001	0.0007	0.0016	0.0004	0.0000		0.0004		4.04	
	0.0009	4.71	0.1114		4.82	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.5932
	0.0011	4.30			4.30	0.0001			0.0001	0.0002	0.0002	0.0004	0.0001			0.0001	0.0000	0.0001	0.0002	0.0000			0.0000		0.3866	
	0				0				0	0.0367	0.0201	0.0568				0	0.0092	0.0070	0.0162				0			
0.7053	1.41	7,958.3		213.1	8,171.4	0.0198		0.0040	0.0238	0.2647	0.2682	0.5568	0.0182		0.0037	0.0219	0.0662	0.0939	0.1819	0.0797		0.0023	0.0820	874.5		
0.0187	0.0232	188.8		9.06	197.8	0.0004		0.0002	0.0006	0.0126	0.0065	0.0197	0.0004		0.0002	0.0005	0.0032	0.0023	0.0059	0.0019		0.0001	0.0020	21.2		
	0.0000	0.0090			0.0090	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000	0.0000			0.0000		0.0008	
	0				0				0	0.0005	0.0003	0.0008				0	0.0001	0.0001	0.0002				0			
0.0622	0.1248	633.2		18.7	651.9	0.0016		0.0004	0.0020	0.0180	0.0221	0.0421	0.0015		0.0003	0.0018	0.0045	0.0077	0.0141	0.0063		0.0002	0.0065	69.8		
0.0005	0.0006	5.45		0.2853	5.74	0.0000		0.0000	0.0000	0.0004	0.0002	0.0006	0.0000		0.0000	0.0000	0.0001	0.0001	0.0002	0.0001		0.0000	0.0001	0.6134		
	0.0023	20.2			20.2	0.0003			0.0003	0.0006	0.0007	0.0017	0.0003			0.0003	0.0001	0.0003	0.0007	0.0002			0.0002		1.82	
	0				0				0	0.0041	0.0023	0.0064				0	0.0010	0.0008	0.0018				0			
0.5319	1.04	5,827.3		162.4	5,989.7	0.0125		0.0025	0.0150	0.1573	0.1912	0.3635	0.0115		0.0023	0.0138	0.0393	0.0669	0.1200	0.0584		0.0017	0.0601	640.9		
0.0060	0.0074	60.4		3.59	64.0	0.0001		0.0000	0.0002	0.0041	0.0021	0.0063	0.0001		0.0000	0.0002	0.0010	0.0007	0.0019	0.0006		0.0000	0.0006	6.84		
	0.4332	360.0	2.25		362.2	0.0159	0.0005		0.0164	0.0071	0.0461	0.0697	0.0152	0.0005		0.0157	0.0018	0.0162	0.0337	0.0034	0.0000		0.0035		32.6	
	0				0				0	0.0056	0.0275	0.0331				0	0.0014	0.0096	0.0110				0			
0.1847	0.2181	651.5	2.61	7.18	661.3	0.0011		0.0001	0.0012	0.0068	0.0661	0.0741	0.0010		0.0001	0.0011	0.0017	0.0232	0.0259	0.0065	0.0000	0.0001	0.0066	70.7		
	0.2143	194.0	1.69		195.7	0.0078	0.0002		0.0080	0.0033	0.0247	0.0361	0.0075	0.0002		0.0077	0.0008	0.0087	0.0172	0.0019	0.0000		0.0019		17.6	
	0				0				0	0.0013	0.0077	0.0090				0	0.0003	0.0027	0.0030				0			
0.0202	0.0235	86.0	0.3618	0.8211	87.2	0.0001		0.0000	0.0001	0.0008	0.0091	0.0100	0.0001		0.0000	0.0001	0.0002	0.0032	0.0035	0.0009	0.0000	0.0000	0.0009	9.33		
0.0101	0.1464	44.5		2.68	47.2	0.0006		0.0003	0.0009	0.0011	0.0032	0.0052	0.0005		0.0003	0.0009	0.0003	0.0011	0.0023	0.0005		0.0000	0.0005	5.81		
	0.0022	45.7			45.7	0.0002			0.0002	0.0010	0.0013	0.0025	0.0002			0.0002	0.0003	0.0004	0.0009	0.0004			0.0004		4.12	
	0				0				0	0.0037	0.0020	0.0057				0	0.0009	0.0007	0.0016				0			
0.3559	0.6987	3,850.9		115.2	3,966.1	0.0070		0.0015	0.0086	0.0855	0.1056	0.1997	0.0065		0.0014	0.0079	0.0214	0.0370	0.0662	0.0386		0.0012	0.0398	424.2		
0.0037	0.0045	35.5		2.69	38.2	0.0001		0.0000	0.0001	0.0024	0.0012	0.0037	0.0001		0.0000	0.0001	0.0006	0.0004	0.0011	0.0004		0.0000	0.0004	4.09		
	0.0559	19.2			19.2	0.0010			0.0010	0.0003	0.0008	0.0021	0.0010			0.0010	0.0001	0.0003	0.0013	0.0002			0.0002		1.73	
0.0001	0.0037	57.0		0.0075	57.0	0.0000		0.0000	0.0000	0.0004	0.0013	0.0017	0.0000		0.0000	0.0000	0.0001	0.0005	0.0006	0.0006		0.0000	0.0006	6.07		
0.0046	0.0276	30.0	1.33		31.3	0.0005	0.0000		0.0005	0.0002	0.0016	0.0023	0.0005	0.0000		0.0005	0.0001	0.0005	0.0011	0.0003	0.0000		0.0003		2.82	
	0				0				0	0.0001	0.0002	0.0003				0	0.0000	0.0001	0.0001				0			
0.0034	0.0071	20.3	0.1543	0.2072	20.7	0.0000		0.0000	0.0000	0.0002	0.0006	0.0007	0.0000		0.0000	0.0000	0.0000	0.0002	0.0003	0.0002	0.0000	0.0000	0.0002	2.21		
	0.1068	71.5			71.5	0.0002			0.0002			0.0002	0.0002			0.0002			0.0002	0.0007			0.0007		6.43	
	0				0				0			0				0			0				0			
0.0134	0.0535	31.2	2.77		34.0	0.0002	0.0000		0.0002	0.0004	0.0013	0.0019	0.0002	0.0000		0.0002	0.0001	0.0005	0.0007	0.0003	0.0000		0.0003		3.06	
	0				0				0	0.0002	0.0004	0.0006				0	0.0000	0.0001	0.0002				0			
0.0008	0.0027	8.96	0.5185	0.0346	9.52	0.0000		0.0000	0.0000	0.0001	0.0005	0.0006	0.0000		0.0000	0.0000	0.0000	0.0002	0.0002	0.0001	0.0000	0.0000	0.0001	1.02		
	0.0002	0.6783	0.1311		0.8095	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0996
0.0001	0.0003	1.02	0.0073		1.03	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0925	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0001	0.0005	1.41	0.0090		1.42	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1275	
	0				0				0	0.0000	0.0000	0.0001				0	0.0000	0.0000	0.0000				0			
0.0006	0.0015	3.62	0.0398		3.66	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3293	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
0.0016	0.0094	32.9	0.0887		33.0	0.0002	0.0000		0.0002	0.0004	0.0016	0.0022	0.0002	0.0000		0.0002	0.0001	0.0005	0.0009	0.0003	0.0000		0.0003		2.97	
	0				0				0	0.0001	0.0002	0.0004				0	0.0000	0.0001	0.0001				0			
0.0162	0.0396	35.2	1.81		37.0	0.0001	0.0000		0.0001	0.0004	0.0016	0.0021	0.0001	0.0000		0.0001	0.0001	0.0006	0.0007	0.0003	0.0000		0.0004		3.33	
	0				0				0	0.0003	0.0006	0.0009				0	0.0001	0.0002	0.0003				0			
	0.0000	0.0160	0.0020		0.0181	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0022
0.0081	0.0195	17.4	0.9001		18.3	0.0000	0.0000		0.0000	0.0002	0.0008	0.0010	0.0000	0.0000		0.0000	0.0000	0.0003	0.0004	0.0002	0.0000		0.0002		1.65	
	0				0				0	0.0002	0.0003	0.0005				0	0.0000	0.0001	0.0001				0			
	0.0000	0.0262	0.0033		0.0295	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0036
0.0357	0.0861	76.9	3.97		80.8	0.0002	0.0000		0.0002	0.0009	0.0034	0.0045	0.0001	0.0000		0.0002	0.0002	0.0012	0.0016	0.0007	0.0000		0.0008		7.27	
	0				0				0	0.0007	0.0014	0.0020				0	0.0002	0.0005	0.0006				0			
	0.0000	0.1320	0.0167		0.1486	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0183
0.0101	0.0336	28.2	0.9830		29.2	0.0001	0.0000		0.0001	0.0003	0.0012	0.0016	0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.63	
	0				0				0	0.0001	0.0003	0.0004				0	0.0000	0.0001	0.0001				0			
	0.0000	0.1536	0.0124		0.1660	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0204
0.0292	0.0742	79.5	3.85		83.4	0.0003	0.0000		0.0003	0.0009	0.0035	0.0047	0.0003	0.0000		0.0003	0.0002	0.0012	0.0017	0.0008	0.0000		0.0008		7.50	
	0				0				0	0.0008	0.0014	0.0022				0	0.0002	0.0005	0.0007				0			
	0.0000	0.0472	0.0060		0.0532	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0065
0.0832	0.2050	223.2	10.8		234.1	0.0007	0.0000		0.0007	0.0026	0.0098	0.0131	0.0007	0.0000		0.0007	0.0007	0.0034	0.0048	0.0021	0.0001		0.0022		21.1	
	0				0				0	0.0022	0.0040	0.0062				0	0.0005	0.0014	0.0019				0			
	0.0000	0.1472	0.0187		0.1659	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0204
0.0529	0.1317	142.5	6.91		149.4	0.0005	0.0000		0.0005	0.0017	0.0062	0.0084	0.0004	0.0000		0.0005	0.0004	0.0022	0.0031	0.0014	0.0001		0.0014		13.4	
	0				0				0	0.0014	0.0026	0.0039				0	0.0003	0.0009	0.0012				0			
	0.0000	0.1469	0.0184		0.1653	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0203
0.0428	0.1145	94.3	4.77		99.1	0.0004	0.0000		0.0004	0.0011	0.0041	0.0056	0.0004	0.0000		0.0004	0.0003	0.0014	0.0021	0.0009	0.0000		0.0009		8.92	
	0				0				0	0.0006	0.0012	0.0018				0	0.0002	0.0004	0.0006				0			
	0.0001	0.4217	0.0550		0.4767	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0586
0.0005	0.0013	1.60	0.0669		1.66	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1497	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0029	0.0003		0.0033	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0004
0.0285	0.0884	89.7	3.29		93.0	0.0004	0.0000		0.0004	0.0011	0.0042	0.0057	0.0004	0.0000		0.0004	0.0003	0.0015	0.0021	0.0009	0.0000		0.0009		8.37	
	0				0				0	0.0002	0.0004	0.0006				0	0.0001	0.0001	0.0002				0			
	0.0001	0.5151	0.0464		0.5615	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0691
0.0002	0.0005	1.05	0.0071		1.06	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0951	
0.0002	0.0007	1.44	0.0087		1.45	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.1305	
0.0011	0.0022	3.75	0.0389		3.79	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3408	
0.0014	0.0084	24.7	0.0485		24.7	0.0002	0.0000		0.0002	0.0003	0.0012	0.0017	0.0002	0.0000		0.0002	0.0001	0.0004	0.0007	0.0002	0.0000		0.0002		2.23	
0.0032	0.0289	18.3	1.39		19.7	0.0001	0.0000		0.0001	0.0002	0.0008	0.0011	0.0001	0.0000		0.0001	0.0000	0.0003	0.0004	0.0002	0.0000		0.0002		1.77	
	0				0				0	0.0001	0.0002	0.0004				0	0.0000	0.0001	0.0001				0			
	0.0004	1.30	0.2493		1.55	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.1904
0.0055	0.0362	28.7	2.18		30.9	0.0001	0.0000		0.0001	0.0003	0.0012	0.0016	0.0001	0.0000		0.0001	0.0001	0.0004	0.0006	0.0003	0.0000		0.0003		2.78	
	0				0				0	0.0002	0.0004	0.0005				0	0.0000	0.0001	0.0002				0			
	0.0006	1.91	0.3660		2.27	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.2797
0.0047	0.0342	25.2	1.89		27.1	0.0001	0.0000		0.0001	0.0003	0.0011	0.0014	0.0001	0.0000		0.0001	0.0001	0.0004	0.0005	0.0002	0.0000		0.0003		2.43	
	0				0				0	0.0002	0.0003	0.0005				0	0.0000	0.0001	0.0002				0			
	0.0007	2.16	0.4201		2.58	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001				0			0.3173
0.0182	0.1409	110.3	6.88		117.2	0.0005	0.0000		0.0005	0.0012	0.0047	0.0064	0.0005	0.0000		0.0005	0.0003	0.0016	0.0024	0.0011	0.0001		0.0011		10.6	
	0				0				0	0.0007	0.0013	0.0020				0	0.0002	0.0005	0.0006				0			
	0.0025	9.29	1.50		10.8	0.0000	0.0000		0.0000	0.0001	0.0005	0.0006	0.0000	0.0000		0.0000	0.0000	0.0002	0.0002				0			1.33
0.0006	0.0015	2.29	0.0807		2.37	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.2134	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0021	0.0002		0.0023	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0003
0.0001	0.0003	0.4328	0.0153		0.4480	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0403	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0004	0.0000		0.0004	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0001
0.0001	0.0003	0.5805	0.0169		0.5974	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000		0.0538	
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
	0.0000	0.0005	0.0000		0.0006	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0001
	0				0				0	0.0006	0.0012	0.0018				0	0.0002	0.0004	0.0006				0			
0.0110	0.0182	109.5	0.7340	1.05	111.3	0.0001		0.0000	0.0001	0.0008	0.0031	0.0041	0.0001		0.0000	0.0001	0.0002	0.0011	0.0014	0.0011	0.0000	0.0000	0.0011	11.9		
0.1057	1.21	780.8	58.0		838.8	0.0183	0.0001		0.0184	0.0220	0.0500	0.0904	0.0175	0.0001		0.0176	0.0055	0.0175	0.0406	0.0074	0.0006		0.0080		75.5	
	0				0				0	0.0061	0.0069	0.0130				0	0.0015	0.0024	0.0039				0			
	0.0012	2.56	0.5724		3.13	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001				0			0.3855
0.1712	1.87	1,120.9	74.7		1,195.6	0.0268	0.0002		0.0270	0.0331	0.0750	0.1351	0.0257	0.0002		0.0258	0.0083	0.0262	0.0603	0.0107	0.0007		0.0114		107.6	
0.0739	0.7378	407.2	32.2		439.5	0.0103	0.0001		0.0104	0.0120	0.0273	0.0497	0.0099	0.0001		0.0100	0.0030	0.0095	0.0225	0.0039	0.0003		0.0042		39.6	
0.0006	0.0082	7.39	0.1404		7.53	0.0001	0.0000		0.0001	0.0002	0.0005	0.0008	0.0001	0.0000		0.0001	0.0000	0.0002	0.0003	0.0001	0.0000		0.0001		0.6778	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
0.0034	0.0251	17.9	0.7326		18.6	0.0002	0.0000		0.0002	0.0005	0.0012	0.0019	0.0002	0.0000		0.0002	0.0001	0.0004	0.0008	0.0002	0.0000		0.0002		1.67	
	0				0				0	0.0001	0.0001	0.0002				0	0.0000	0.0000	0.0001				0			
0.0000	0.0000	0.0000	0.0000		0.0000	0	0		0	0	0.0000	0.0000	0	0		0	0	0	0	0	0		0		0.0000	
	0				0				0	0	0	0				0	0	0	0				0			
0.1234	0.6967	301.0	12.3		313.3	0.0023	0.0001		0.0023	0.0066	0.0195	0.0285	0.0022	0.0001		0.0022	0.0016	0.0068	0.0107	0.0029	0.0001		0.0030		28.2	
	0				0				0	0.0031	0.0047	0.0079				0	0.0008	0.0017	0.0024				0			
	0.0019	5.27	0.5114		5.79	0.0000	0.0000		0.0000	0.0001	0.0004	0.0006	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002				0			0.7116
0.0059	0.0829	74.3	1.04		75.3	0.0004	0.0000		0.0004	0.0008	0.0045	0.0057	0.0003	0.0000		0.0004	0.0002	0.0016	0.0021	0.0007	0.0000		0.0007		6.78	
	0				0				0	0.0011	0.0032	0.0043				0	0.0003	0.0011	0.0014				0			
	0.0257	63.1	4.55		67.6	0.0001	0.0000		0.0001	0.0018	0.0103	0.0121	0.0001	0.0000		0.0001	0.0004	0.0036	0.0041				0			8.32
0.0032	0.0137	13.0	0.5219		13.5	0.0001	0.0000		0.0001	0.0003	0.0008	0.0012	0.0001	0.0000		0.0001	0.0001	0.0003	0.0005	0.0001	0.0000		0.0001		1.22	
	0				0				0	0.0003	0.0004	0.0008				0	0.0001	0.0001	0.0002				0			
	0.0001	0.2555	0.0313		0.2869	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000				0			0.0353
0.0265	0.1074	75.0	4.14		79.1	0.0009	0.0000		0.0009	0.0018	0.0042	0.0069	0.0009	0.0000		0.0009	0.0004	0.0015	0.0028	0.0007	0.0000		0.0008		7.12	
	0				0				0	0.0010	0.0013	0.0023				0	0.0003	0.0004	0.0007				0			
	0.0007	1.51	0.2445		1.75	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002	0.0000	0.0000		0.0000	0.0000	0.0000	0.0001				0			0.2152
0.0852	0.3042	206.7	12.7		219.4	0.0024	0.0000		0.0024	0.0050	0.0120	0.0193	0.0023	0.0000		0.0023	0.0012	0.0042	0.0077	0.0020	0.0001		0.0021		19.7	
	0				0				0	0.0034	0.0042	0.0076				0	0.0009	0.0015	0.0023				0			
	0.0019	4.39	0.8004		5.20	0.0000	0.0000		0.0000	0.0001	0.0004	0.0005	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002				0			0.6390
0.1988	0.6674	330.0	26.8		356.9	0.0056	0.0001		0.0057	0.0091	0.0215	0.0363	0.0054	0.0001		0.0054	0.0023	0.0075	0.0152	0.0031	0.0003		0.0034		32.1	
	0				0				0	0.0015	0.0018	0.0034				0	0.0004	0.0006	0.0010				0			
	0.0024	4.76	1.12		5.88	0.0000	0.0000		0.0000	0.0002	0.0004	0.0006	0.0000	0.0000		0.0000	0.0000	0.0001	0.0002				0			0.7227
0.0031	0.0062	3.73	0.0799		3.81	0.0000	0.0000		0.0000	0.0001	0.0002	0.0003	0.0000	0.0000		0.0000	0.0000	0.0001	0.0001	0.0000	0.0000		0.0000		0.3433	
	0				0				0	0.0000	0.0001	0.0001				0	0.0000	0.0000	0.0000				0			
	0				0				0	0.0000	0.0000	0.0000				0	0.0000	0.0000	0.0000				0			
0.0000	0.0005	0.3943		0.0014	0.3957	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0434		
	0.0009	3.44			3.44	0.0000			0.0000	0.0001	0.0004	0.0005	0.0000			0.0000	0.0000	0.0001	0.0002	0.0000			0.0000		0.3096	
	0				0				0	0.0027	0.0057	0.0084				0	0.0007	0.0020	0.0027				0			
0.0000	0.0001	1.32		0.0026	1.32	0.0000		0.0000	0.0000	0.0000	0.0001	0.0002	0.0000		0.0000	0.0000	0.0000	0.0000	0.0001	0.0000		0.0000	0.0000	0.1412		
	0.0007	13.0			13.0	0.0000			0.0000	0.0004	0.0011	0.0015	0.0000			0.0000	0.0001	0.0004	0.0005				0			1.60

MSAT Summary

CAPITAL SOUTHEAST CONNECTOR

MSAT Summary Tables

Mobile Source Air Toxics (tons/day)

	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Diesel PM	Ethylbenzene	Formaldehyde	Naphthalene	POM	DEOG
I-5 No Connector	0.0001278	0.0003877	0.0000274	0.0009184	0.0014183	0.0007701	0.0009622	0.0000740	0.0000220	0.0038451
I-5 Connector	0.0001272	0.0003860	0.0000273	0.0009146	0.0014123	0.0007668	0.0009581	0.0000736	0.0000219	0.0038288
Difference (Connector VMT - No Connector VMT)	-0.0000006	-0.0000017	-0.0000001	-0.0000039	-0.0000061	-0.0000033	-0.0000041	-0.0000003	-0.0000001	-0.0000163
%	-0.43%	-0.43%	-0.40%	-0.42%	-0.43%	-0.43%	-0.42%	-0.45%	-0.50%	-0.42%
US Route 50 No Connector	0.000339953	0.000554683	7.53981E-05	0.002331829	0.001297531	0.002001577	0.001624366	0.00018618	5.01552E-05	0.00360224
US Route 50 Connector	0.000337417	0.000550604	7.47367E-05	0.002314413	0.00128783	0.001986585	0.001612241	0.000184747	4.98245E-05	0.00357535
Difference (Connector VMT - No Connector VMT)	-2.53532E-06	-4.07855E-06	-6.61387E-07	-1.74165E-05	-9.70034E-06	-1.49914E-05	-1.21254E-05	-1.433E-06	-3.30693E-07	-2.6896E-05
%	-0.75%	-0.74%	-0.88%	-0.75%	-0.75%	-0.75%	-0.75%	-0.77%	-0.66%	-0.75%
State Route 99 No Connector	0.000264996	0.000632837	5.75407E-05	0.001864119	0.002061763	0.00157884	0.00165953	0.000149253	4.23288E-05	0.00559974
State Route 99 Connector	0.000264224	0.000630963	5.73202E-05	0.001858387	0.00205548	0.00157399	0.001654459	0.000148812	4.22185E-05	0.00558255
Difference (Connector VMT - No Connector VMT)	-7.71618E-07	-1.87393E-06	-2.20462E-07	-5.73202E-06	-6.28317E-06	-4.85017E-06	-5.07063E-06	-4.40925E-07	-1.10231E-07	-1.7196E-05
%	-0.29%	-0.30%	-0.38%	-0.31%	-0.30%	-0.31%	-0.31%	-0.30%	-0.26%	-0.31%

Notes: Mobile Source Air Toxics (MSAT) calculated using the Caltrans EMFAC2017 model, which is capable of estimating MSAT emissions. This model uses the CARB EMFAC2017 emission factors

Mobile Source Air Toxics (lbs/day)

	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Diesel PM	Ethylbenzene	Formaldehyde	Naphthalene	POM	DEOG
I-5 No Connector	0.2555158	0.7753658	0.0548951	1.8368916	2.8366879	1.5401494	1.9244151	0.1479302	0.0440925	7.6901646
I-5 Connector	0.2544135	0.7720588	0.0546746	1.8291754	2.8245625	1.5335355	1.9162580	0.1472688	0.0438720	7.6575362
Difference (Connector VMT - No Connector VMT)	-0.0011023	-0.0033069	-0.0002205	-0.0077162	-0.0121254	-0.0066139	-0.0081571	-0.0006614	-0.0002205	-0.0326284
%	-0.43%	-0.43%	-0.40%	-0.42%	-0.43%	-0.43%	-0.42%	-0.45%	-0.50%	-0.42%
US Route 50 No Connector	0.6799056	1.1093661	0.1507962	4.6636587	2.5950613	4.0031538	3.2487319	0.3723608	0.1003103	7.2044863
US Route 50 Connector	0.6748350	1.1012090	0.1494734	4.6288257	2.5756606	3.9731709	3.2244810	0.3694948	0.0996489	7.1506935
Difference (Connector VMT - No Connector VMT)	-0.005070632	-0.008157104	-0.001322774	-0.034833037	-0.019400679	-0.029982868	-0.024250849	-0.002866009	-0.000661387	-0.05379279
%	-0.75%	-0.74%	-0.88%	-0.75%	-0.75%	-0.75%	-0.75%	-0.77%	-0.66%	-0.75%
State Route 99 No Connector	0.5299913	1.2656738	0.1150813	3.7282373	4.1235262	3.1576810	3.3190594	0.2985059	0.0846575	11.1994829
State Route 99 Connector	0.5284480	1.2619260	0.1146404	3.7167733	4.1109598	3.1479806	3.3089181	0.2976241	0.0844370	11.1650908
Difference (Connector VMT - No Connector VMT)	-0.001543236	-0.003747858	-0.000440925	-0.011464038	-0.012566349	-0.00970034	-0.010141264	-0.000881849	-0.000220462	-0.03439211
%	-0.29%	-0.30%	-0.38%	-0.31%	-0.30%	-0.31%	-0.31%	-0.30%	-0.26%	-0.31%

2000 conversion from tons to lbs

CTEMCAC2017 Output

File Name: I-5_No Connector_Sacramento (SV) - 2040 - Annual.EM
CT-EMFAC2017 Version: 1.0.2.27401
Run Date: 3/30/2022 9:16
Area: Sacramento (SV)
Analysis Year: 2040
Season: Annual

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Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.047	0.55	0.45
Truck 2	0.086	0.941	0.04
Non-Truck	0.867	0.015	0.932

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Road Type: Freeway
Silt Loading Factor: CARB 0.015 g/m2
Precipitation Correction: CARB P = 57 days N = 365 days

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Road Length: 1225654 miles
Volume: 1 vehicles per hour
Number of Hours: 1 hours

VMT Distribution by Speed Bin (mph):

<= 5 mph	0.19%
10 mph	0.64%
15 mph	1.46%
20 mph	4.35%
25 mph	12.01%
30 mph	8.56%
35 mph	14.60%
40 mph	17.69%
45 mph	7.04%
50 mph	7.39%
55 mph	13.03%
60 mph	10.38%
65 mph	2.22%
70 mph	0.43%
75 mph	0.01%

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Summary of Emissions and Consumption

Pollutant Name	Running Exhaust (grams)	Running Loss (grams)	Tire Wear (grams)	Brake Wear (grams)	Road Dust (grams)	Total (grams)	Total (US tons)
PM2.5	1,863.30	-	2,944.00	23,229.80	13,836.40	41,873.60	0.046
PM10	1,972.90	-	11,774.90	54,202.10	92,241.50	160,191.40	0.177
NOx	218,504.70	-	-	-	-	218,504.70	0.241
CO	606,905.70	-	-	-	-	606,905.70	0.669
HC	30,515.30	27,413.80	-	-	-	57,929.10	0.064
TOG	32,888.20	29,308.90	-	-	-	62,197.10	0.069
ROG	17,243.00	29,308.90	-	-	-	46,551.80	0.051
1,3-Butadiene	115.9	0	-	-	-	115.9	< 0.001
Acetaldehyde	351.7	-	-	-	-	351.7	< 0.001
Acrolein	24.9	-	-	-	-	24.9	< 0.001
Benzene	540.2	293.1	-	-	-	833.2	< 0.001
Diesel PM	1,286.70	-	-	-	-	1,286.70	0.001
Ethylbenzene	217.9	480.6	-	-	-	698.6	< 0.001
Formaldehyde	872.9	-	-	-	-	872.9	< 0.001
Naphthalene	26.1	41	-	-	-	67.1	< 0.001
POM	20	-	-	-	-	20	< 0.001
DEOG	3,488.20	-	-	-	-	3,488.20	0.004
CO2	341,590,466.10	-	-	-	-	341,590,466.10	376.539
N2O	21,814.20	-	-	-	-	21,814.20	0.024
CH4	14,012.90	4,806.40	-	-	-	18,819.20	0.021
BC	376.4	-	-	-	-	376.4	< 0.001
HFC	-	98.7	-	-	-	98.7	< 0.001

Fuel Type	Fuel Consumption (gallons)
Gasoline	27,665.62
Diesel	10,646.89

==========END==========

File Name: I-5_Connector_Sacramento (SV) - 2040 - Annual.EM
CT-EMFAC2017 Version: 1.0.2.27401
Run Date: 3/30/2022 9:17
Area: Sacramento (SV)
Analysis Year: 2040
Season: Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.047	0.55	0.45
Truck 2	0.086	0.941	0.04
Non-Truck	0.867	0.015	0.932

==========

Road Type: Freeway
Silt Loading Factor: CARB 0.015 g/m2
Precipitation Correction: CARB P = 57 days N = 365 days

==========

Road Length: 1220422 miles
Volume: 1 vehicles per hour
Number of Hours: 1 hours

VMT Distribution by Speed Bin (mph):

<= 5 mph	0.19%
10 mph	0.64%
15 mph	1.46%
20 mph	4.35%
25 mph	12.01%
30 mph	8.56%
35 mph	14.60%
40 mph	17.69%
45 mph	7.04%
50 mph	7.39%
55 mph	13.03%
60 mph	10.38%
65 mph	2.22%
70 mph	0.43%
75 mph	0.01%

==========

Summary of Emissions and Consumption

Pollutant Name	Running Exhaust (grams)	Running Loss (grams)	Tire Wear (grams)	Brake Wear (grams)	Road Dust (grams)	Total (grams)	Total (US tons)
PM2.5	1,855.30	-	2,931.50	23,130.70	13,777.30	41,694.80	0.046
PM10	1,964.50	-	11,724.60	53,970.70	91,847.70	159,507.60	0.176
NOx	217,572.00	-	-	-	-	217,572.00	0.24
CO	604,315.00	-	-	-	-	604,315.00	0.666
HC	30,385.00	27,296.80	-	-	-	57,681.80	0.064
TOG	32,747.80	29,183.70	-	-	-	61,931.60	0.068
ROG	17,169.40	29,183.70	-	-	-	46,353.10	0.051
1,3-Butadiene	115.4	0	-	-	-	115.4	< 0.001
Acetaldehyde	350.2	-	-	-	-	350.2	< 0.001
Acrolein	24.8	-	-	-	-	24.8	< 0.001
Benzene	537.9	291.8	-	-	-	829.7	< 0.001
Diesel PM	1,281.20	-	-	-	-	1,281.20	0.001
Ethylbenzene	217	478.6	-	-	-	695.6	< 0.001
Formaldehyde	869.2	-	-	-	-	869.2	< 0.001
Naphthalene	26	40.8	-	-	-	66.8	< 0.001
POM	19.9	-	-	-	-	19.9	< 0.001
DEOG	3,473.40	-	-	-	-	3,473.40	0.004
CO2	340,132,304.80	-	-	-	-	340,132,304.80	374.932
N2O	21,721.10	-	-	-	-	21,721.10	0.024
CH4	13,953.00	4,785.80	-	-	-	18,738.90	0.021
BC	374.8	-	-	-	-	374.8	< 0.001
HFC	-	98.3	-	-	-	98.3	< 0.001

Fuel Type	Fuel Consumption (gallons)
Gasoline	27,547.52
Diesel	10,601.44

==========END==========

File Name: Route_50_No Connector_Sacramento (SV) - 2040 - Annual.EM
CT-EMFAC2017 Version: 1.0.2.27401
Run Date: 3/30/2022 9:31
Area: Sacramento (SV)
Analysis Year: 2040
Season: Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.016	0.55	0.45
Truck 2	0.029	0.941	0.04
Non-Truck	0.955	0.015	0.932

==========

Road Type: Freeway
Silt Loading Factor: CARB 0.015 g/m2
Precipitation Correction: CARB P = 57 days N = 365 days

==========

Road Length: 3090005 miles
Volume: 1 vehicles per hour
Number of Hours: 1 hours

VMT Distribution by Speed Bin (mph):

<= 5 mph	0.19%
10 mph	0.64%
15 mph	1.46%
20 mph	4.35%
25 mph	12.01%
30 mph	8.56%
35 mph	14.60%
40 mph	17.69%
45 mph	7.04%
50 mph	7.39%
55 mph	13.03%
60 mph	10.38%
65 mph	2.22%
70 mph	0.43%
75 mph	0.01%

==========

Summary of Emissions and Consumption

Pollutant Name	Running Exhaust (grams)	Running Loss (grams)	Tire Wear (grams)	Brake Wear (grams)	Road Dust (grams)	Total (grams)	Total (US tons)	
PM2.5	2,777.90	-	6,618.80	52,666.10	24,618.10	86,680.80		0.096
PM10	2,972.30	-	26,478.30	122,889.50	164,116.40	316,456.40		0.349
NOx	241,301.50	-	-	-	-	241,301.50		0.266
CO	1,620,644.80	-	-	-	-	1,620,644.80		1.786
HC	76,422.80	70,372.60	-	-	-	146,795.40		0.162
TOG	80,999.80	75,237.40	-	-	-	156,237.20		0.172
ROG	41,888.40	75,237.40	-	-	-	117,125.80		0.129
1,3-Butadiene	308.4	0	-	-	-	308.4	< 0.001	
Acetaldehyde	503.2	-	-	-	-	503.2	< 0.001	
Acrolein	68.4	-	-	-	-	68.4	< 0.001	
Benzene	1,363.10	752.3	-	-	-	2,115.40		0.002
Diesel PM	1,177.10	-	-	-	-	1,177.10		0.001
Ethylbenzene	581.9	1,233.90	-	-	-	1,815.80		0.002
Formaldehyde	1,473.60	-	-	-	-	1,473.60		0.002
Naphthalene	63.6	105.3	-	-	-	168.9	< 0.001	
POM	45.5	-	-	-	-	45.5	< 0.001	
DEOG	3,267.90	-	-	-	-	3,267.90		0.004
CO2	702,832,629.60	-	-	-	-	702,832,629.60		774.74
N2O	27,561.00	-	-	-	-	27,561.00		0.03
CH4	35,147.70	12,432.90	-	-	-	47,580.60		0.052
BC	618.7	-	-	-	-	618.7	< 0.001	
HFC	-	151.1	-	-	-	151.1	< 0.001	

Fuel Type	Fuel Consumption (gallons)
Gasoline	71,710.90
Diesel	9,864.55

==========END==========

File Name: Route_50_Connector_Sacramento (SV) - 2040 - Annual.EM
CT-EMFAC2017 Version: 1.0.2.27401
Run Date: 3/30/2022 9:31
Area: Sacramento (SV)
Analysis Year: 2040
Season: Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.016	0.55	0.45
Truck 2	0.029	0.941	0.04
Non-Truck	0.955	0.015	0.932

==========

Road Type: Freeway
Silt Loading Factor: CARB 0.015 g/m2
Precipitation Correction: CARB P = 57 days N = 365 days

==========

Road Length: 3066893 miles
Volume: 1 vehicles per hour
Number of Hours: 1 hours

VMT Distribution by Speed Bin (mph):

<= 5 mph	0.19%
10 mph	0.64%
15 mph	1.46%
20 mph	4.35%
25 mph	12.01%
30 mph	8.56%
35 mph	14.60%
40 mph	17.69%
45 mph	7.04%
50 mph	7.39%
55 mph	13.03%
60 mph	10.38%
65 mph	2.22%
70 mph	0.43%
75 mph	0.01%

==========

Summary of Emissions and Consumption

Pollutant Name	Running Exhaust (grams)	Running Loss (grams)	Tire Wear (grams)	Brake Wear (grams)	Road Dust (grams)	Total (grams)	Total (US tons)
PM2.5	2,757.10	-	6,569.30	52,272.10	24,433.90	86,032.40	0.095
PM10	2,950.10	-	26,280.20	121,970.30	162,888.80	314,089.40	0.346
NOx	239,496.60	-	-	-	-	239,496.60	0.264
CO	1,608,522.80	-	-	-	-	1,608,522.80	1.773
HC	75,851.20	69,846.30	-	-	-	145,697.50	0.161
TOG	80,393.90	74,674.70	-	-	-	155,068.60	0.171
ROG	41,575.10	74,674.70	-	-	-	116,249.80	0.128
1,3-Butadiene	306.1	0	-	-	-	306.1	< 0.001
Acetaldehyde	499.5	-	-	-	-	499.5	< 0.001
Acrolein	67.8	-	-	-	-	67.8	< 0.001
Benzene	1,352.90	746.7	-	-	-	2,099.60	0.002
Diesel PM	1,168.30	-	-	-	-	1,168.30	0.001
Ethylbenzene	577.5	1,224.60	-	-	-	1,802.20	0.002
Formaldehyde	1,462.60	-	-	-	-	1,462.60	0.002
Naphthalene	63.1	104.5	-	-	-	167.6	< 0.001
POM	45.2	-	-	-	-	45.2	< 0.001
DEOG	3,243.50	-	-	-	-	3,243.50	0.004
CO2	697,575,609.70	-	-	-	-	697,575,609.70	768.945
N2O	27,354.80	-	-	-	-	27,354.80	0.03
CH4	34,884.80	12,339.90	-	-	-	47,224.70	0.052
BC	614.1	-	-	-	-	614.1	< 0.001
HFC	-	149.9	-	-	-	149.9	< 0.001

Fuel Consumption

Fuel Type	(gallons)
Gasoline	71,174.52
Diesel	9,790.77

==========END==========

File Name: SR-99_No Connector_Sacramento (SV) - 2040 - Annual.EM
CT-EMFAC2017 Version: 1.0.2.27401
Run Date: 3/30/2022 9:33
Area: Sacramento (SV)
Analysis Year: 2040
Season: Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.033	0.55	0.45
Truck 2	0.061	0.941	0.04
Non-Truck	0.906	0.015	0.932

==========

Road Type: Freeway
Silt Loading Factor: CARB 0.015 g/m2
Precipitation Correction: CARB P = 57 days N = 365 days

==========

Road Length: 2479541 miles
Volume: 1 vehicles per hour
Number of Hours: 1 hours

VMT Distribution by Speed Bin (mph):

<= 5 mph	0.19%
10 mph	0.64%
15 mph	1.46%
20 mph	4.35%
25 mph	12.01%
30 mph	8.56%
35 mph	14.60%
40 mph	17.69%
45 mph	7.04%
50 mph	7.39%
55 mph	13.03%
60 mph	10.38%
65 mph	2.22%
70 mph	0.43%
75 mph	0.01%

==========

Summary of Emissions and Consumption

Pollutant Name	Running Exhaust (grams)	Running Loss (grams)	Tire Wear (grams)	Brake Wear (grams)	Road Dust (grams)	Total (grams)	Total (US tons)	
PM2.5	3,088.70	-	5,673.20	44,902.00	24,361.50	78,025.40		0.086
PM10	3,281.50	-	22,690.30	104,768.00	162,412.40	293,152.20		0.323
NOx	332,944.30	-	-	-	-	332,944.30		0.367
CO	1,260,013.90	-	-	-	-	1,260,013.90		1.389
HC	61,553.90	55,878.40	-	-	-	117,432.30		0.129
TOG	65,851.60	59,741.20	-	-	-	125,592.70		0.138
ROG	34,309.40	59,741.20	-	-	-	94,050.50		0.104
1,3-Butadiene	240.4	0	-	-	-	240.4	< 0.001	
Acetaldehyde	574.1	-	-	-	-	574.1	< 0.001	
Acrolein	52.2	-	-	-	-	52.2	< 0.001	
Benzene	1,093.60	597.4	-	-	-	1,691.10		0.002
Diesel PM	1,870.40	-	-	-	-	1,870.40		0.002
Ethylbenzene	452.5	979.8	-	-	-	1,432.30		0.002
Formaldehyde	1,505.50	-	-	-	-	1,505.50		0.002
Naphthalene	51.7	83.7	-	-	-	135.4	< 0.001	
POM	38.4	-	-	-	-	38.4	< 0.001	
DEOG	5,080.00	-	-	-	-	5,080.00		0.006
CO2	635,001,467.80	-	-	-	-	635,001,467.80		699.969
N2O	34,443.30	-	-	-	-	34,443.30		0.038
CH4	28,294.50	9,831.10	-	-	-	38,125.60		0.042
BC	644.3	-	-	-	-	644.3	< 0.001	
HFC	-	164.8	-	-	-	164.8	< 0.001	

Fuel Consumption

Fuel Type	(gallons)
Gasoline	56,647.85
Diesel	15,542.44

==========END==========

File Name: SR-99_Connector_Sacramento (SV) - 2040 - Annual.EM
CT-EMFAC2017 Version: 1.0.2.27401
Run Date: 3/30/2022 9:34
Area: Sacramento (SV)
Analysis Year: 2040
Season: Annual

==========

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.033	0.55	0.45
Truck 2	0.061	0.941	0.04
Non-Truck	0.906	0.015	0.932

==========

Road Type: Freeway
Silt Loading Factor: CARB 0.015 g/m2
Precipitation Correction: CARB P = 57 days N = 365 days

==========

Road Length: 2471970 miles
Volume: 1 vehicles per hour
Number of Hours: 1 hours

VMT Distribution by Speed Bin (mph):

<= 5 mph	0.19%
10 mph	0.64%
15 mph	1.46%
20 mph	4.35%
25 mph	12.01%
30 mph	8.56%
35 mph	14.60%
40 mph	17.69%
45 mph	7.04%
50 mph	7.39%
55 mph	13.03%
60 mph	10.38%
65 mph	2.22%
70 mph	0.43%
75 mph	0.01%

==========

Summary of Emissions and Consumption

Pollutant Name	Running Exhaust (grams)	Running Loss (grams)	Tire Wear (grams)	Brake Wear (grams)	Road Dust (grams)	Total (grams)	Total (US tons)
PM2.5	3,079.30	-	5,655.90	44,764.90	24,287.10	77,787.10	0.086
PM10	3,271.50	-	22,621.00	104,448.10	161,916.50	292,257.10	0.322
NOx	331,927.70	-	-	-	-	331,927.70	0.366
CO	1,256,166.60	-	-	-	-	1,256,166.60	1.385
HC	61,365.90	55,707.80	-	-	-	117,073.80	0.129
TOG	65,650.50	59,558.80	-	-	-	125,209.30	0.138
ROG	34,204.60	59,558.80	-	-	-	93,763.40	0.103
1,3-Butadiene	239.7	0	-	-	-	239.7	< 0.001
Acetaldehyde	572.4	-	-	-	-	572.4	< 0.001
Acrolein	52	-	-	-	-	52	< 0.001
Benzene	1,090.30	595.6	-	-	-	1,685.90	0.002
Diesel PM	1,864.70	-	-	-	-	1,864.70	0.002
Ethylbenzene	451.1	976.8	-	-	-	1,427.90	0.002
Formaldehyde	1,500.90	-	-	-	-	1,500.90	0.002
Naphthalene	51.5	83.4	-	-	-	135	< 0.001
POM	38.3	-	-	-	-	38.3	< 0.001
DEOG	5,064.40	-	-	-	-	5,064.40	0.006
CO2	633,062,561.90	-	-	-	-	633,062,561.90	697.832
N2O	34,338.10	-	-	-	-	34,338.10	0.038
CH4	28,208.10	9,801.10	-	-	-	38,009.20	0.042
BC	642.3	-	-	-	-	642.3	< 0.001
HFC	-	164.3	-	-	-	164.3	< 0.001

Fuel Type	Fuel Consumption (gallons)
Gasoline	56,474.88
Diesel	15,494.98

==========END==========

ITEM 14 d

KITTELSON & ASSOCIATES
2510 J Street, Suite 200
Sacramento, CA 95816
P 916.266.2190

MARK THOMAS

MEMORANDUM: Climate Adaptation & Resiliency

May 20, 2022 Project #: 27098

To: Matt Lampa, PE, Principal Civil Engineer
Capital SouthEast Connector JPA
10640 Mather Blvd., Suite 120
Mather, CA 95655

CC: Derek Minnema, PE, Executive Director

From: Matt Braughton, RSP; Kelly Laustsen; and Mike Aronson, PE; Kittelson & Associates, Inc.
Ryan Bissegger and Sam Sharvini, Mark Thomas

RE: Connector Project Performance Benefits Study – Climate Adaptation & Resiliency

Executive Summary

Climate change presents numerous challenges for California and the greater Sacramento region. Agencies are working to address these challenges through a variety of strategies. The Capital SouthEast Connector (Connector) will play a key role in making the region more resilient by providing an **all-weather corridor** and **key evacuation route**, as well as preserving open space and threatened habitats. Specific benefits of the Connector include:

- **Improved mobility and reduced vehicle miles traveled**, by providing multimodal facilities, reducing congestion, and improving traffic operations. This reduces greenhouse gases that contribute to climate change. In addition, the Connector decreases travel times and increases route options for emergency responders and local residents during emergency events.
- **Added redundancy in the energy network** with "new and upgraded electric infrastructure needed to continue to provide reliable service" (Arlen Orchard, Sacramento Municipal Utility District).
- **An all-weather corridor with upgraded stormwater management facilities** that can accommodate 100-year storm events. This addresses corridor flooding impacts, which frequently disrupt operations on the corridor.
- **Reduced wildfire risk** with a wider fire break and the relocation of utility poles farther away from the roadway through a dedicated public utility easement.
- **Smart corridor elements,** like changeable message signs, that can share key notifications in an emergency.
- **A robust evacuation route** able to serve south Sacramento County in the event of an emergency.

This memorandum provides further information on the Connector's role in climate adaptation and resiliency, and includes the following sections:

I. Key Takeaways
II. Project Background
III. Climate Change Challenges
IV. State and Regional Response to Climate Adaptation and Resiliency
V. Connector Project Outcomes
VI. Conclusion

The following page summarizes the key takeaway from the Climate Adaptation and Resiliency Analysis.

I. KEY TAKEAWAYS

CLIMATE ADAPTATION & RESILIENCY ANALYSIS

CAPITAL | SOUTHEAST CONNECTOR JPA
Connecting Communities

The Connector is an opportunity to address multiple local, regional, and state initiatives, goals, and plans to improve local and regional resiliency against climate change and its impacts. It also reduces the factors that contribute to these outcomes. The Connector will transform an older road with substandard features into a safe, efficient multimodal corridor that will prepare the region's ability to respond to unforseen conditions in the decades to come. The improved corridor will allow people and goods to circulate more easily, enhancing the region's ability to respond to emergencies.

IMPACTS FROM CLIMATE CHANGE ON THE REGION INCLUDE FREQUENT FLOODING AND WILDFIRES

The Connector provides climate resiliency benefits including:

IMPROVED MOBILITY AND REDUCED VEHICLE MILES TRAVELED

The Connector provides multimodal facilities, reduces congestion, and improves traffic operations, which reduces greenhouse gases that contribute to climate change. In addition, the Connector decreases travel times and increases route options for emergency responders and local residents during emergency events.

ADDED REDUNDANCY IN THE ENERGY NETWORK

The Connector project hardens existing electric infrastructure and provides redundancy for the electrical power grid, helping maintain service if there is damage to other regional facilities.

AN ALL-WEATHER CORRIDOR

The Connector's stormwater management facilities will accommodate 100-year storm events and reduce corridor flooding impacts.

REDUCED WILDFIRE RISK

A wider roadway serves as a fire break and provides access for emergency responders. The project moves utility poles farther away from the roadway, reducing the risk of downed power lines and fire risks.

SMART CORRIDOR ELEMENTS

Changeable message signs along the Connector provide a way to share key notifications in an emergency. Other Smart Corridor Planning strategies support reliability, safety, and emergency technologies.

A ROBUST EVACUATION ROUTE

The Connector will serve as the primary emergency evacuation route for south Sacramento County.

II. Project Background

The southeast region of Sacramento County between Elk Grove and El Dorado Hills must balance housing, mobility, and goods movement with the need to preserve the natural environment and its agricultural and biological resources. Climate change effects such as droughts, floods, wildfires, and sea level rise make this balancing act more of a challenge.

The increasing intensity and frequency of climatic events pose a risk to the communities that live, work, and travel through the region and depend on reliable transportation infrastructure. As a result, this part of the region has been consistently analyzed in local and regional documents and plans to find strategies to address the challenges of climate change.

The Connector is a future multimodal and multijurisdictional roadway improvement that will link Interstate 5 (I-5), State Route 99 (SR 99), and US Highway 50 (US 50), forging a reliable connection between southern Sacramento County and western El Dorado County. The Connector provides an all-weather corridor, guaranteeing mobility, access, and connectivity while preserving open space and threatened habitats.

III. Climate Change Challenges

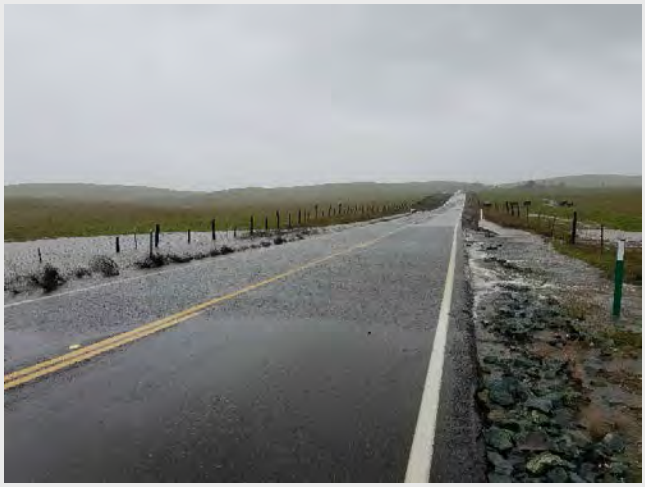
Climatic events increasingly disrupt transportation for both people and goods through the greater Sacramento region. Floods and wildfires, which are becoming more intense and frequent, are responsible for the most pronounced impacts.

FLOODING

Grant Line Road and White Rock Road are two of the primary roads that make up the Connector alignment. Built over 60 years ago, they were not constructed to accommodate current demands or weather conditions. The roadways have substandard vertical curves and drainage facilities and are subject to regular flooding. The projected increase in extreme wet and dry seasons will mean stronger, more sudden storms for the Sacramento region with significant rainfall totals. Roadway flooding will become more frequent.

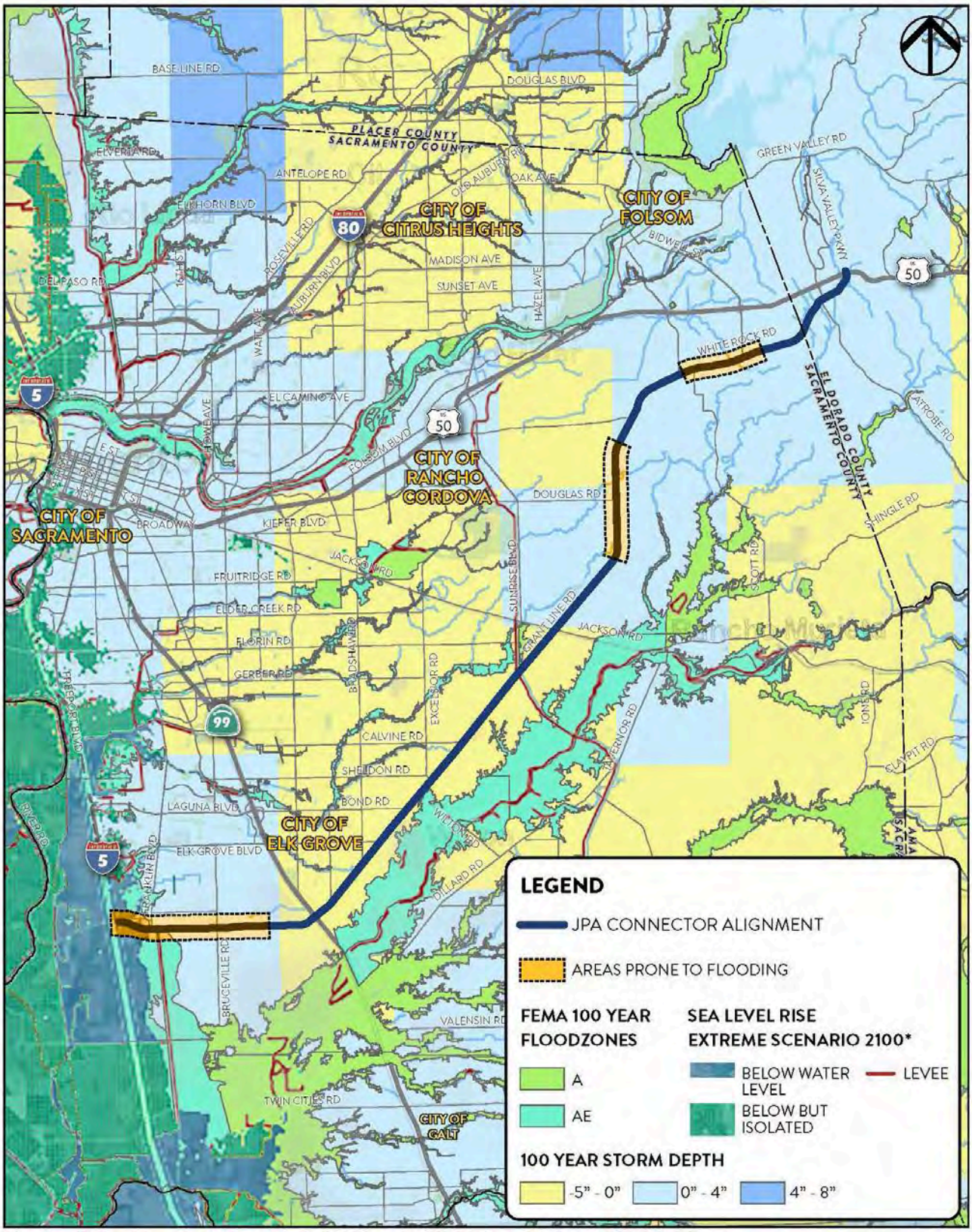
Rising sea levels will exacerbate this issue given the region's geography and topography. Most of Sacramento County is close to sea level or even below in some areas. The region's proximity to the ocean through the Sacramento-San Joaquin Delta means that low lying areas, including the southeast portion of the project area near Elk Grove and Franklin, are more likely to flood during future climatic events. Figure 1 illustrates the Connector alignment, showing flood zones and areas prone to flooding on the corridor.

White Rock Road alone has been closed five times due to flooding since 2018



Flooding results in roadway closures and lengthy detours using adjacent routes. It can also delay emergency response vehicles.

Figure 1. Connector Alignment and Flooding



WILDFIRES

The pastureland in the region is subject to grass fires, posing risks to surrounding communities and nearby homes. Fires have become more frequent in recent years due to drier weather and more extreme heat related to climate change. Dry, hot conditions paired with high winds contribute to the increased likelihood and severity of wildfires in the region.

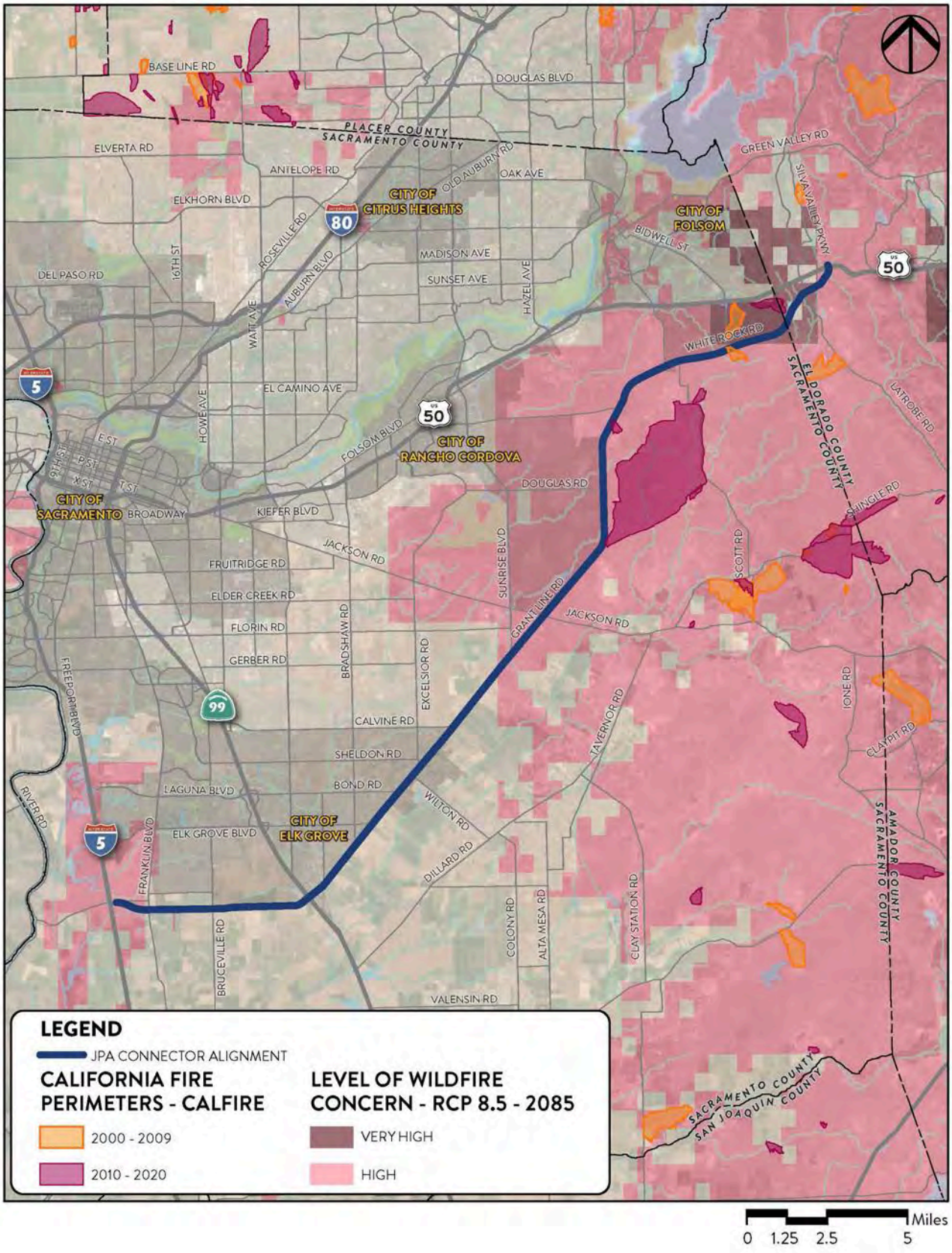
- In June 2020, over 5,000 acres burned as part of the Grant Fire along Grant Line Road, causing the closure of multiple roadways and evacuations.
- In July 2013, the 50 Fire burned 163 acres between US-50 and White Rock Road at the Folsom-El Dorado County line.
- Since 2000, other fires that have burned within a three-mile radius of the Connector include the Payen Fire, White Fire, and Boys Fire, with several others within a 10-mile radius.

Figure 2 illustrates wildfires that have occurred in the region since 2000, as well as area of very high or high wildfire concern, based on the Sacramento Area Council of Governments (SACOG) 2020 Vulnerability and Criticality Assessment. These recent wildfires highlight the risk of fires in the area and the need for evacuation routes and access for emergency responders.

Fire near Teichert Plant

Source: The Sacramento Bee

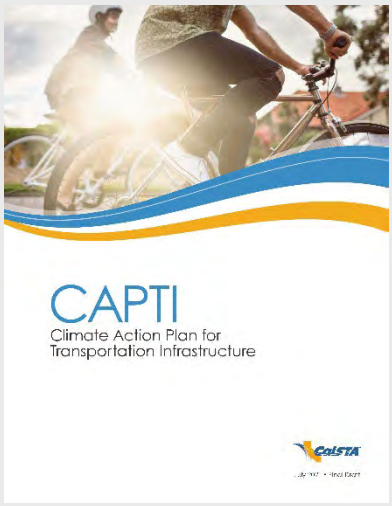
Figure 2. Connector Alignment and Recent Wildfires



IV. State and Regional Response to Climate Adaptation and Resiliency

California and the Sacramento Region have responded to the threat posed by climate change, with a variety of efforts working to expand resiliency in the region's infrastructure and mobility needs in the face of climate change and its impact. The table below highlights related state, regional, and local plans that the Connector project supports.

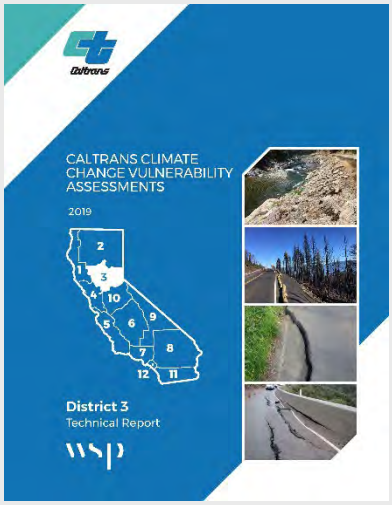
California State Transportation Agency (CalSTA) Climate Action Plan for Transportation Infrastructure (CAPTI)



The Plan outline strategies and actions that will advance more sustainable, equitable, and healthy modes of transportation and accelerate the transition to zero-emission vehicle technology. It includes the adoption of guiding principles for transportation investments, implementation strategies and actions to help advance projects that meet climate goals, and a system for tracking progress on CAPTI implementation. The Connector project supports several of the guiding principles in the plan, including:

- Investing in networks of safe and accessible bicycle and pedestrian infrastructure
- Including investments in light, medium, and heavy-duty zero-emission vehicle (ZEV) infrastructure
- Making safety improvements to reduce fatalities and severe injuries of all users towards zero
- Protecting natural and working lands

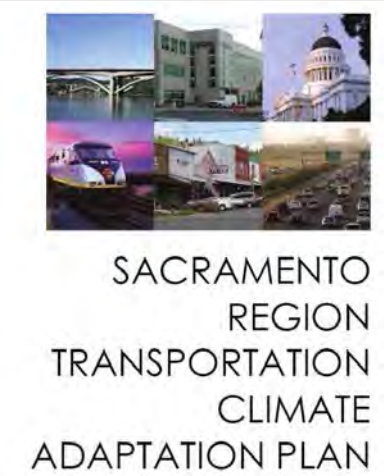
California State Department of Transportation (Caltrans) Climate Change Vulnerability Assessments (2019)



Caltrans conducted a vulnerability assessment for the portion of State Highway System (SHS) in Caltrans District 3. The assessment specifically examined SHS vulnerabilities from long-term changes in climate, including rising temperatures, longer and more severe droughts, more volatile and larger precipitation, larger and more frequent wildfires, and rising sea levels. This report highlights the need for projects that address extreme weather events, like the Connector project.

"The recent wildfire seasons have been significant and devastating."

Sacramento Area Council of Governments (SACOG) Sacramento Regional Transportation Climate Adaptation Plan (2015)

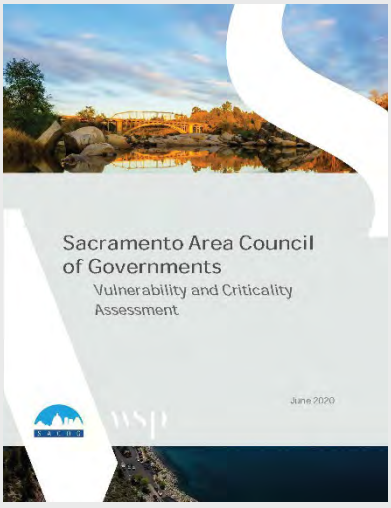


This plan identifies how extreme temperature, precipitation, wildfire, and landslide climate risks, will impact transportation facilities, as well as adaptation strategies. The Plan recommends adopting four areas of focus to ensure the region's transportation system becomes adaptable to potential climate related risks, including Stakeholder Engagement, Asset Level Assessments, Climate Adaptation in Transportation Funding, and Monitoring.

The Connector project supports the Plan's Guiding Principle of Access and Mobility:

"As extreme weather events will likely increase due to climate change, SACOG must maintain access by supporting all forms of transportation modes and encouraging a flexible travel network."

SACOG Vulnerability and Criticality Assessment (2020)

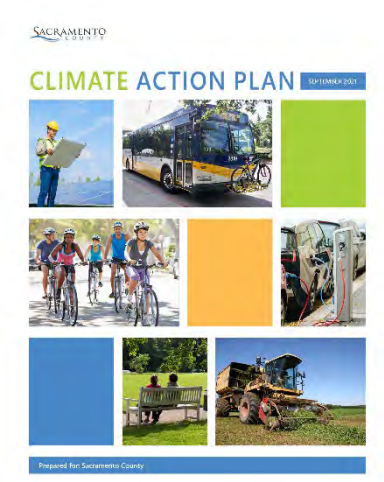


SACOG assessed how climate-related hazards will impact the region's transportation systems. This assessment determined that the Southeast region would likely either experience or continue to experience the following by 2085:

- High-levels of wildfire concern (shown on map in Figure 1)
- An eight-to-twelve-degree change in average weekly maximum temperature
- Up to four inches of increased depth in 100-year storms

These findings highlight the need for an all-weather corridor designed to withstand flooding events.

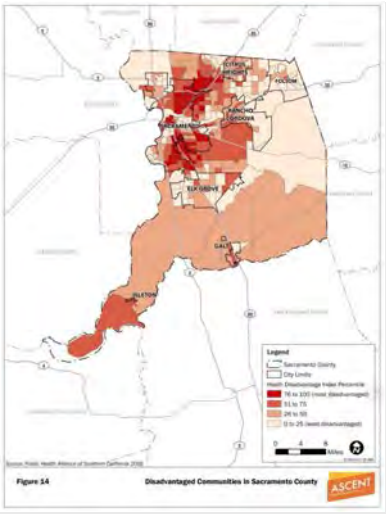
County of Sacramento Climate Action Plan (2021)



This plan recommends various strategies to combat the effects of climate change in the Sacramento region, such as increased temperatures, wildfires, drought, flooding, and sea-level rise. This plan also identifies major initiatives within the 2005-2030 Sacramento County General Plan that address climate-related hazards.

The Capital SouthEast Connector project is identified as one of the General Plan's elements that will encourage sustainable building practices, efficient use of resources, and ecological stewardship.

County of Sacramento Climate Change Vulnerability Assessment (2017)

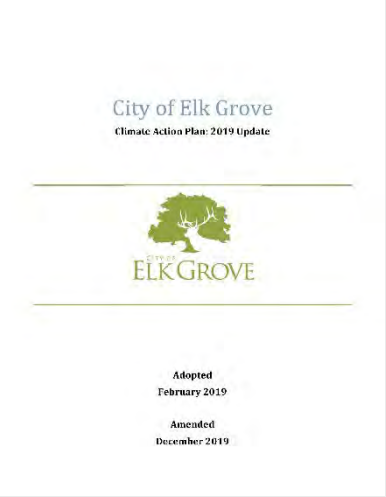


This assessment details Sacramento County' climate change exposure, sensitivity, potential impacts, and adaptive capacity. It identifies various countywide design guidelines that require infrastructure and development to be more sustainable and implement land use and transportation-related strategies designed to reduce mobile source (vehicle) greenhouse gas (GHG) emissions that contribute to the severity of potential climate change impacts. This document identifies the Southeast region as being vulnerable to both sea-level rise and wildfires, with the greatest at-risk population in the region to these threats.

South Sacramento Habitat Conservation Plan (SSHCP)

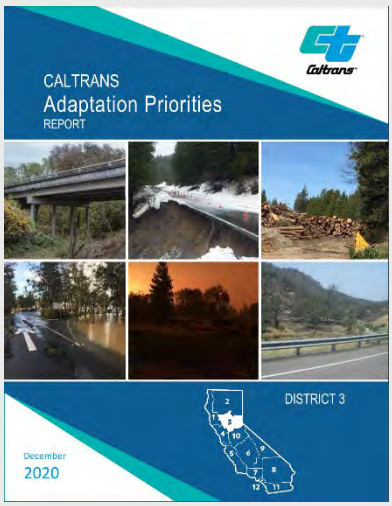
This regional effort provides development and infrastructure projects with streamlined, predictable federal and state permitting processes while creating a Preserve System to protect habitat, open space, and agricultural lands. The SSHCP was prepared by five local agencies, including the Connector JPA, to collectively apply for Incidental Take Permits that will grant take for covered species resulting from implementing covered activities in exchange for habitat conservation and other commitments. The SSHCP ensures creation of large, interconnected preserves sustained in perpetuity by an adequately-funded management program. It includes portions of unincorporated Sacramento County, Galt, and the southern half of Rancho Cordova, totaling 36,282 acres. The SSHCP Conservation Strategy includes protecting natural waterways, managing preserved lands, maintaining biological diversity and watershed functions, and reestablishing or establishing land cover and riparian or other aquatic land.

City of Elk Grove Climate Action Plan (2019)



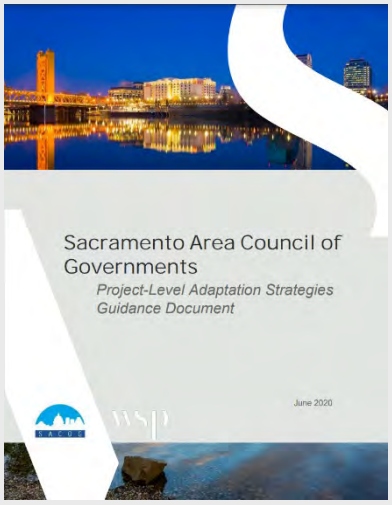
This plan identifies how the City of Elk Grove will achieve state-recommended targets of reducing GHG emissions to 1990 levels by 2020 and 40 percent below 1990 levels by 2030. The plan demonstrates initial progress toward meeting the State's long-term 2050 goal of reducing emissions to 80 percent below 1990 levels and provides goals and associated measures, also referred to as GHG reduction strategies, in energy use, transportation, land use, and solid waste sectors.
The Connector project supports the Plan's goals around pedestrian and bicycle travel, as well as encouraging adoption of electric vehicles.

Caltrans Adaptation Priorities (2020)



Caltrans developed a report to prioritize the order in which assets exposed to climate hazards will undergo detailed asset-level climate assessments in Caltrans District 3. The prioritization considers, amongst other things, the timing of the climate impacts, their severity and extensiveness, the condition of each asset (a measure of the sensitivity of the asset to damage), the number of system users affected, and the level of network redundancy in the area. This report identifies operational measures to enhance resiliency and the consideration of adaptation, as well as adaptation-enhancing capital improvement projects, such as the Connector project.

SACOG Project-Level Adaptation Strategies Guidance Document (2020)



SACOG's report provides guidance for addressing climate change risk at the project-level in the Sacramento region and offers recommendations to SACOG for advancing the resiliency of the region's transportation system. A major component of this study was to assess climate impacts and adaptation strategies for a few transportation projects representative of common project types in the region. These representative projects provide examples for SACOG and its member agencies which can be used to guide similar assessments in the future relating to extreme heat, wildfire risk, sea level rise, and flooding. Resiliency strategies identified by the document and consistent with the Connector project include:

- Enabling remote traffic control through Traffic Management Centers
- Updating traffic signal timing plans
- Increasing proactive maintenance to decrease degradation

Office of Planning and Research (OPR) Integrated Climate Adaptation and Resiliency Program (2020)

OPR's 2020 Impact Report and Program Recommendations highlights some of the accomplishments of the Integrated Climate Adaptation and Resiliency Program (ICARP) since its launch in 2017, and outlines recommended programmatic next steps to advance California's leadership on adaptation, resilience, and integrated climate action. To do so, the report touches on ongoing and emerging opportunities, challenges, gaps, and risks, and explores the work ahead for ICARP to best respond to the unique realities present in California. Strategies identified by ICARP that are also incorporated into the Connector project include:

- Supporting telecommunication systems
- Prioritizing natural infrastructure through habitat protection
- Integrating climate benefits for flexible and adaptive solutions to climate changes and emerging circumstances

V. Connector Project Outcomes

The Connector project includes a variety of improvements to create a modern, all-weather corridor, including improved drainage facilities, a separate multiuse path, and smart corridor elements. The Connector addresses current flooding and drainage issues and expands transportation choices, both elements that are critical to addressing climate change and future extreme heat, drought, wildfire, flooding, and sea level rise.

The Connector will serve both regional and local multimodal travel needs and relieve congestion on I-5, US 50, and SR 99. In addition, a key component of the project is preserving open space, wildlife habitat, and agricultural production in the region.

These project elements also serve a vital role in efforts to address local, regional, and state initiatives, goals, and plans to prepare for and mitigate potential future climate change impacts.

IMPROVED MOBILITY AND REDUCED VEHICLE MILES TRAVELED

The Connector helps address regional goals by improving mobility for all modes. Mitigating congestion and improving traffic operations along the Connector provides a more direct route for commuters and goods movement and reduces emissions from congestion. This results in reduced vehicle miles traveled and an overall decrease in GHG emissions. This is particularly beneficial for the underserved communities along the regions' freeway system. The memorandum *Travel Demand Model (TDM) Update Summary* (September 2021) documents the results of travel demand modeling for the Connector, developed by Kimley Horn and peer reviewed by Kittelson. Based on the modeling work, the Connector would result in the following changes to vehicle miles traveled (VMT):

- Congested daily VMT would be reduced approximately 0.74 percent.
- Overall daily VMT would be reduced by 0.01 percent.
- Vehicle hours traveled (VHT) would be reduced by 0.15 percent

The Connector reduces VMT and congested VMT through reduced congestion and vehicle idling on US 50 and SR 99 and provides a shorter, more direct commute route. . Based on the model, "the addition of the Connector results in a net decrease of 998 daily VHT [vehicle hours traveled] within the region. This is primarily due to vehicles using the Connector as an alternative to congested US-50 and SR-99 roadways" (Kimley Horn, 2021).

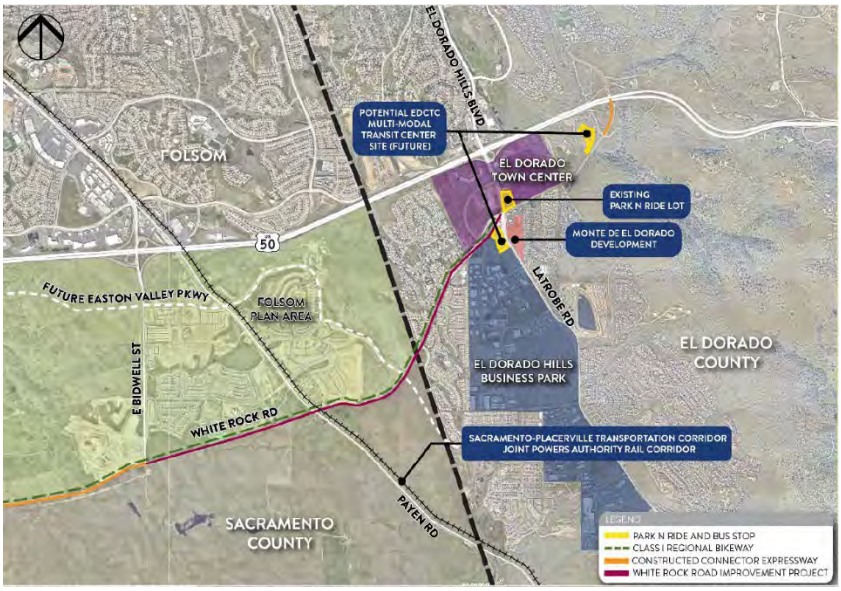
As documented in the *Capital SouthEast Connector Benefit-Cost Analysis* memorandum, average travel speeds and VMT were used to calculate overall travel time savings with an estimated travel time savings benefit to new users of $204.3 million and $1.2 billion for existing users in undiscounted 2021 dollars (Economic & Planning Systems, Inc., 2022). The combination of reduced VMT and congested VMT and VHT has a positive effect on GHG emissions and climate resiliency.

The Connector would result in the following emission reductions from congested VMT improvements based on air quality and greenhouse gas emissions analysis (Rincon and Kittelson, 2022):

- Carbon Dioxide (CO_2) by 2 metric tons per day.
- Carbon Monoxide (CO) by 0.036 tons per day.
- Particulate Matter 2.5 ($PM_{2.5}$) by 0.0004 tons per day.
- Particulate Matter 10 (PM_{10}) by 0.001 tons per day.
- Nitrous Oxide (NOX) by 0.006 tons per day.

The Connector provides multimodal facilities to further address GHG emission reductions. A class I multiuse path along the majority of the corridor, with buffered bike lanes and sidewalks along some portions of the corridor with adjacent development. This provides options for walking and biking along roadways that currently have no to minimal shoulders and few sidewalk facilities.

Increasing transit access and trips can also reduce GHG emissions. El Dorado Transit, in cooperation with El Dorado County Transportation Commission (EDCTC), is planning a new multimodal transit center adjacent to the corridor. The multimodal transit center will serve as a mobility hub, offering a range of transit options and are easily accessible by walking and biking, further encouraging transit ridership. This high-quality transit facility will provide connections between various housing developments and the El Dorado Hill Business Park and Town Center, removing the barrier of car ownership and encouraging transit use by residents in El Dorado Hills. Furthermore, the Kammerer Road portion of the Project in the City of Elk Grove is being planned as the foundation for a walkable city. The City of Elk Grove put together a Kammerer Road Urban Design Strategies report in 2021 proposing to transform the facility into a transit-oriented development corridor supported by more density and diversity in land use and transit-oriented design. This will create a community with roadway modifications to support complete streets, pedestrian-priority, bicycle access, and bus rapid transit improvements.



ADDED REDUNDANCY IN THE ENERGY NETWORK

The Connector project hardens existing electric infrastructure and provides redundancy for the electrical power grid. The project includes a wider clear zone between the roadway and utility poles. A dedicated utility easement is provided where the Sacramento Municipal Utility District (SMUD) will continue to relocate its overhead transmission lines. By moving utilities farther away from the roadway, the project will allow for maintenance to occur without disruption to traffic, and also allow for interrupt critical utility service without safety concerns due to traffic. In addition, the wider clear zone reduces the likelihood of vehicles striking utility poles, which can create power outages. Based on information from SMUD, there were 20 hits of SMUD utility poles along the connector alignment between 2016 and 2020 and 51 hits over the last two decades, with an increase in frequency of pole hits over the past several years.

One of the adaptation strategies around energy developed by the California Office of Planning and Research is **"harden energy infrastructure systems against damage from climate-related effects and expand reducing in the energy network."**

ENERGY

ResilientCA.org

SMUD 69 kV lines adjacent to the Connector provide redundancy in the system throughout the southeast county. This is also true for communications and fiber optic lines along the alignment that are attached to SMUD poles or have their own poles directly adjacent to the alignment. If there's damage to other regional electrical

facilities, the electrical corridor along the Connector can provides a redundant connection to maintain power to customers. This will maintain service during inclement weather and fire scenarios where power may be interrupted for emergency operations.

> SMUD is constantly planning and preparing to expand our electric grid to meet the needs of our growing community. The Connector Expressway often provides a logical route for new and upgraded electric infrastructure needed to continue to provide reliable service to SMUD's customer-owners. SMUD and Connector Expressway staff have worked cooperatively for years to coordinate the construction of new electric infrastructure with the design of the four-lane expressway.
>
> Arlen Orchard, Chief Executive Office & General Manager, SMUD

REDUCED WILDFIRE RISK

The Connector project widens the existing corridor from a two-lane cross section with no to minimal shoulders to a four-lane cross section with a landscape median, shoulders, and clear recovery zone. More pavement along a wider roadway inherently serves as a fire break zone—a gap in flammable material that reduces the speed or likelihood that a wildfire can jump from one side of the gap to the other. Not only will the project improve this fire break by providing more pavement, but much of the project limits will also include extensive easements along project right-of-way that will be managed as an additional fire break zone. This will provide more leverage to emergency responders to controlling future wildfires and enhance the safety of local communities. In addition, the project moves existing utility poles farther away from the roadway, reducing the potential of utility poles being struck by vehicles, which can reduce fire risk due to downed power lines.

INTEGRATION OF SMART CORRIDOR ELEMENTS

Smart Corridor Planning strategies are included as part of the project to integrate emerging technologies and improve overall corridor adaptability, efficiency, and interoperability. These strategies include implementing backbone communications, vehicle detection, CCTV cameras, changeable message signs (CMSs), a 144-strand single-mode fiber optic trunk line with dedicated intelligent transportation system (ITS)-related infrastructure, and increased pavement striping widths to support vehicle sensors for automated vehicle technologies. The Connector project supports the objectives of Smart Region Sacramento, including reliability, safety, and disaster preparedness.

Future CMS locations were identified as part of the SACOG Smart Region Sacramento ITS Architecture and Technology Master Plan Update, including eight locations along the Connector alignment. CMSs can be used to share key notifications in an emergency. Developing a notification system for natural hazards is one of the adaptation strategies around emergency management developed by the California Office of Planning and Research and shared on the Adaptation Clearinghouse, available at ResilientCA.org.

Source: Smart Corridor Plan, March 2019

> "Emergency management encompasses preparedness, disaster response, recovery, and longer-term resilience planning."
>
> – ResilientCA.org

ROBUST EVACUATION ROUTE

The Connector will serve as a key evacuation route for emergencies. The Project improves the corridor's capacity to efficiently move traffic during evacuations and provides better access for emergency vehicles through a combination of improved capacity, implementation of a Class I multiuse path, and new easements and medians. Changeable message signs implemented along the corridor will help route traffic and provide critical information to the public during evacuations and emergency situations. The Project is designed to maintain operations through 100-year storm events and even withstand events more severe than 100-year events, as per the JPA Project design guideline, to preserve emergency access and evacuation needs. The route also provides redundancy in evacuation routes for larger regional emergencies by providing an additional high-capacity route paralleling portions of State Route 50 and State Route 99 to serve multiple evacuation route needs.

> "Construction of the Capital SouthEast Connector Expressway will improve emergency response times for South Sacramento County and will also provide an alternate route during critical emergencies. This important issue was driven home last winter when significant portions of the Connector Expressway alignment were flooded, eliminating its use as an evacuation route or for emergency vehicles and personnel."
>
> —Stephanie Cantelme, Chief, Sacramento Office of Emergency Services

> "A more severe crisis, such as a Folsom Dam breach, would inundate a wide swath of the Highway 50 corridor from Folsom through Sacramento, including Highway 50 itself, forcing residents to use alternative routes to evacuate the area. Right now, those alternatives are either very limited or don't exist. The Capital SouthEast Connector Expressway provides that needed evacuation route."
>
> —Jim Cooper, Assembly Member, 9th District

ALL WEATHER CORRIDOR

The versatility and adaptability of the Connector provides the region a corridor that will be able to perform in all types of weather. Its new culverts and roadside drainage ditches will significantly upgrade existing drainage infrastructure along the corridor to accommodate 100-year storm events. Reinforced concrete pipes will be used to improve durability and resistance towards fire events. This will help keep the road usable during inclement weather for all users, especially emergency responders.

Improved drainage will reduce pavement damage caused by stormwater and flooding. Pavement materials become susceptible to damage from the excess moisture when exposed to higher volumes of water, including stripping of aggregates from asphalt binder and increased cracking. This will maintain the quality of travel along the corridor during climate events and keep the roadway passable all year, regardless of temperature or moisture. Pavement can also become damaged or scarred from fire events. Project pavement materials have been selected to improve resistance towards such occurrences and maintain at least 60 percent integrity.

VI. Conclusion

As documented through this memorandum, the Connector project will play a key role in making the region more resilient by providing an **all-weather corridor** and **key evacuation route**, as well as **preserving open space and threatened habitats**. It supports regional strategies aimed at adaptation and sustainability, including supporting goals around energy and emergency management developed by the California Office of Planning and Research (OPR). As defined by the OPR, “A community’s resilience is determined by its ability to survive, adapt, and thrive no matter what acute shock or chronic stressor it experiences” (resilientca.gov). The Connector project ensures the Sacramento region’s ability to endure future climate events, and helps the region move towards a more sustainable future.

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