CONGESTED CORRIDORS PLAN

Final Plan March 2020

Final Plan March 2020

Prepared For
San Joaquin Council of Governments
Caltrans

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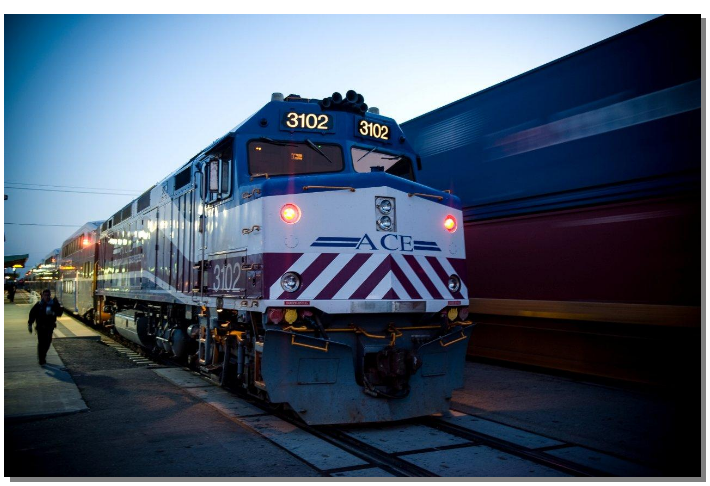
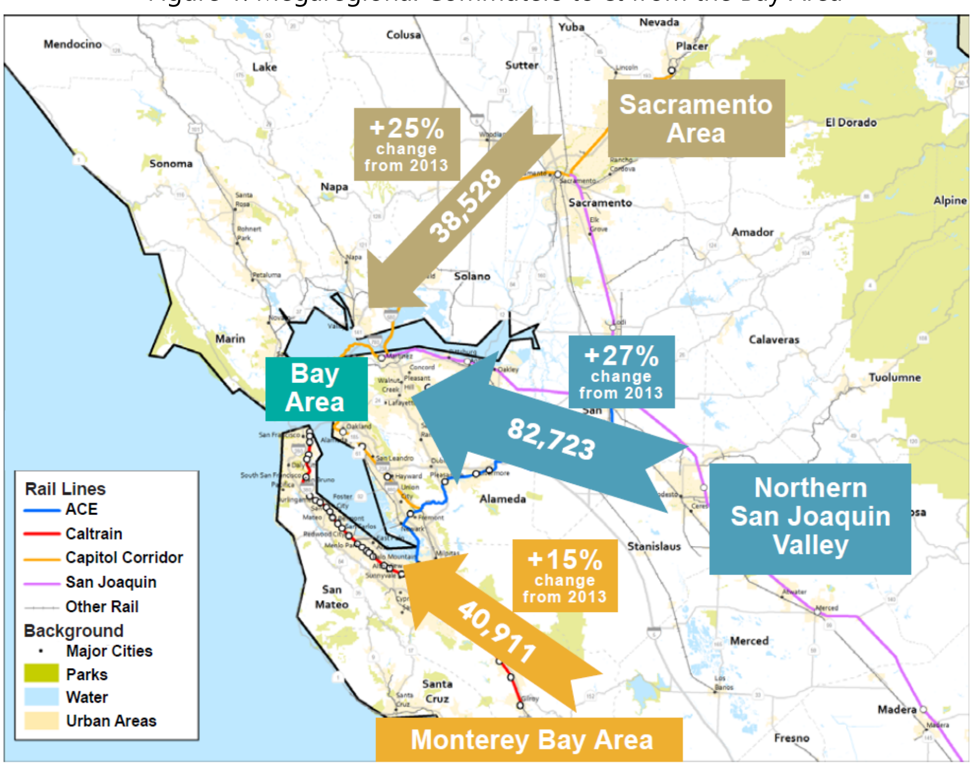


CHAPTER 1. INTRODUCTION

The Northern San Joaquin Valley has always been a major part of the economic growth of the Greater San Francisco Bay Area. As the economy of the Bay Area expanded, and the demand for workers and housing increased, the annual growth rate increased to 3.3% per year between 1980 and 2005. On top of the population growth, freight traffic on the Altamont Pass has steadily increased as international trade, agricultural and consumer goods travel to and from California's Central Valley.

Every weekday morning, starting well before the sun rises over the Sierra Nevada Mountains, the long line of headlights traveling towards the Altamont Pass begins on westbound I-205. Since the end of the Great Recession in 2009, the growth in jobs in the San Francisco Bay Area has outpaced the number of homes by an almost 5:1 jobs to housing ratio. This has resulted in double digit increases in home prices and the exodus of workers and families from the Bay Area to Northern San Joaquin Valley. Here, families are able to afford homes, raise their families and enjoy all the amenities that San Joaquin, Stanislaus and Merced Counties offer. On the other hand, the major imbalance of jobs versus housing has resulted in super commuters that live in the Northern San Joaquin Valley and travel over the Altamont Pass to jobs that are located in the San Francisco Bay Area. As shown in Figure 1 below, the Bay Area Council Economic Institute estimates that in 2016 almost 83,000 commuters from Northern San Joaquin Valley commuted over the Altamont Pass in cars, transit and the Altamont Commuter Express (ACE). This represented a yearly increase of nine (9) percent that results in multiple hours of congestion and delays over the Altamont Pass.

Figure 1: Megaregional Commuters to & from the Bay Area



Source: U.S. Census Bureau American Community Survey 2016 One-Year Estimates Analysis: Bay Area Council Economic Institute

SENATE BILL 1

The Road Repair and Accountability Act (SB1) was signed in to law in 2017 that invests approximately $5 billion each year over the next decade to improve the multi-modal transportation system across California. In order to be eligible to compete for SB1 funding, SJCOG has partnered with Caltrans and local agencies to prepare the I-205, I-5, SR 120 and SR 99 Congested Corridor Plan.

In addition to the State's SCCP funding source, the following additional sources were identified as potential funding sources for the multi-modal projects included in the Congested Corridor Plan:

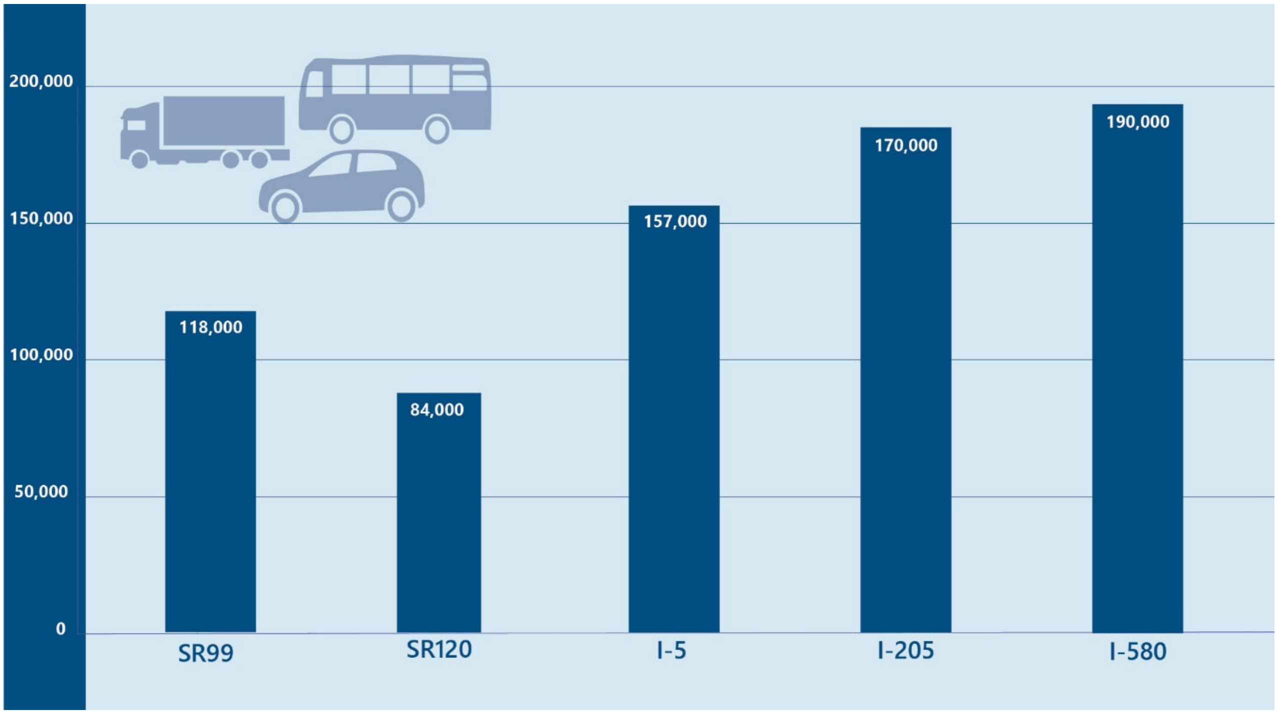
- SB1 – Trade Corridor Enhancement Program (TCEP);
- SB1 – Local Partnership Program (LPP);
- State Transportation Improvement Program (STIP);
    - Interregional Improvement Program (IIP);
    - Regional Improvement Program (RIP);
- Caltrans' Active Transportation Program (ATP);
- Caltrans' Transit and Intercity Rail Capital Program (TIRCP);
- Federal Competitive Funding; and
- Measure K Local Transportation Sales Tax Funding

This report documents the results of the Multi-Modal Travel Demand Forecasting conducted using the Three County Model (SJCOG, StanCOG, and MCAG) for the SJCOG Congested Corridor Plan for I-205, I-5, SR 120 and SR 99 in San Joaquin and Stanislaus Counties. SJCOG is required to adopt a long-range Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) every 4 years. This ambitious Plan focuses on how land-use and transportation can work together to help the region achieve lower greenhouse gas emissions, improve air quality, improve economic opportunity, and reduce impacts on vital farm and natural lands. This Congested Corridor Plan will help implement the 2018 RTP/SCS and inform the next 2022 RTP/SCS.

EXISTING CONDITIONS

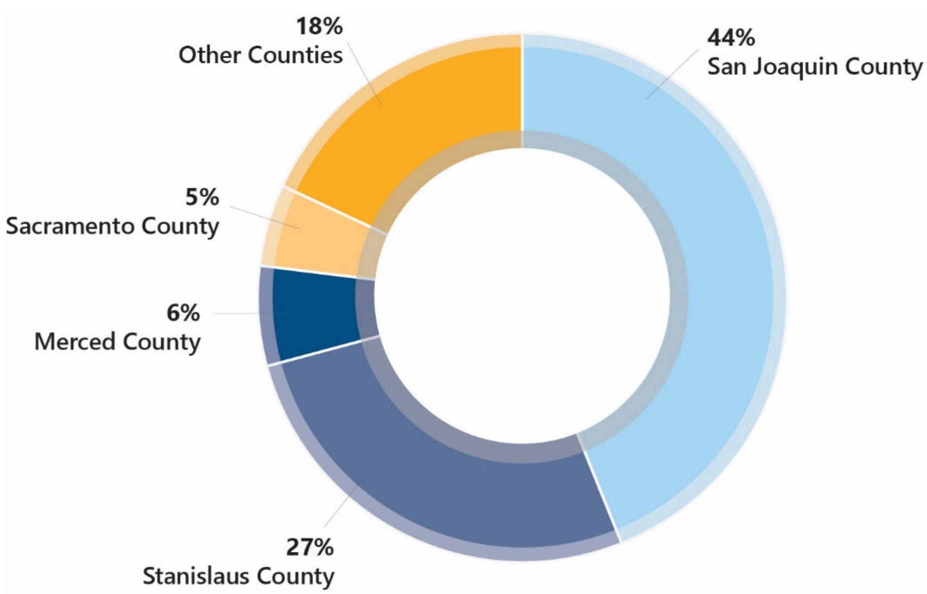
Figure 2 presents the Existing (2018) Average Daily Traffic (ADT) volumes in the project study area and shows that traffic volumes on the I-580 Altamont Pass to and from the San Francisco Bay Area are approaching 200,000 vehicles on a daily basis. On the east side of the corridor, traffic volumes on SR 99 crossing the Stanislaus River are approaching 120,000 vehicles.

Figure 2: Existing ADT Volumes



Source: Caltrans Performance Measurement System (PeMS)

Figure 3: Westbound I-580 – Vehicle Origins by County



Source: INRIX and StreetLight roadway link data

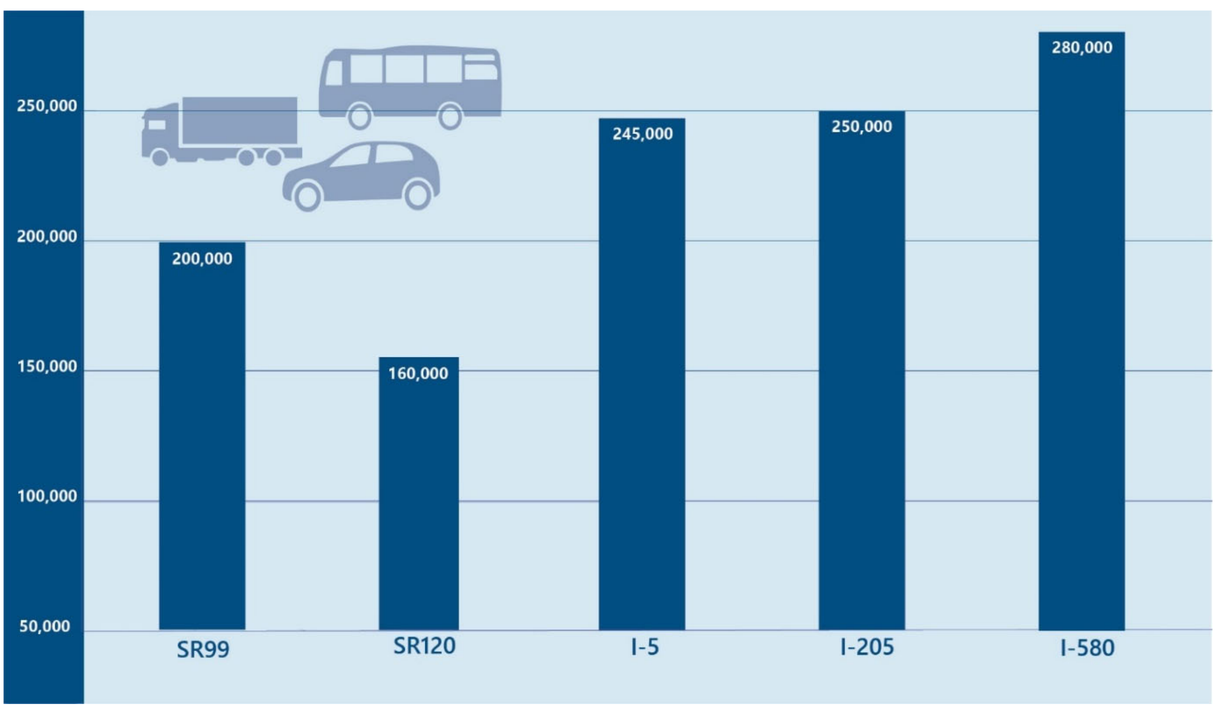
Based on a combination of Big Data (INRIX and Streetlight) and the Three County Regional Travel Demand Model, Figure 3 presents the Existing (2018) Vehicle Origins by County for Westbound I-580 just west of the I-205 / I-580 freeway to freeway connection leaving California's Central Valley. The same percentages would apply for Eastbound I-580 entering California's Central Valley. The results of the analysis show that on a daily basis, about 77% of the vehicle trips (single occupancy vehicle, high occupancy vehicles, truck, and bus) begin within the Three County Region of the Central Valley. The remaining 23% of the trips on westbound I-580 begin in Sacramento County or other parts of California. Based on existing traffic counts and the Three County Model, the following percentages account for traffic to and from the Altamont Pass:

- State Route 99 south – 45%
- State Route 99 north – 5%
- Interstate 5 north – 15%
- I-580 south – 10%
- I-205 corridor – 25%

PURPOSE AND NEED

The purpose of the proposed plan is to improve local, regional, and interregional circulation in the project study area for all modes of travel (cars, trucks, transit, rail, pedestrians and bicyclists) to serve both Existing and Projected (Year 2040) travel between California's Central Valley and the San Francisco Bay Area. Figure 4 presents the projected Future Year (2040) Average Daily Traffic (ADT) volumes in the project study area. Figure 4 shows that daily traffic volumes are projected to increase 47% on Interstate 205, which serves both commuter, goods movement and recreational traffic to and from the San Francisco Bay Area.

Figure 4: Projected 2040 ADT Volumes



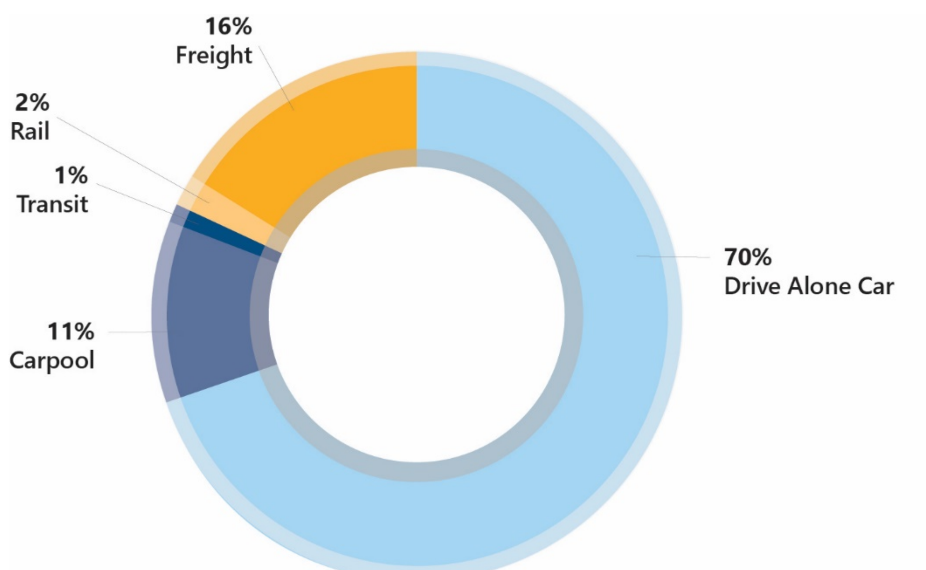
Source: Project Growth in Three County Model and Caltrans Performance Measurement System (PeMS)

The Three County's (San Joaquin, Stanislaus and Merced) Sustainable Communities Strategy of improving economic development will bring over 100,000 new jobs to San Joaquin County, 40,000 new jobs to Stanislaus County and 15,000 to Merced County. The improved jobs to housing balance will result in a slight reduction in the average yearly growth rate of traffic on I-580 from almost 3.0% during the current economic growth period from 2010 to 2019 to a slightly lower 2.4% per year between 2019 and 2040. This will result in the total ADT volume to increase from 190,000 to 280,000 vehicles (a 47% increase) on a daily basis. This will result in westbound I-205 operating at LOS F conditions from 5 AM to almost 11 AM during the morning peak hour by Year 2030.

During the evening peak period, even with the total eastbound I-580 demand volume being metered in Alameda County, the travel lanes on eastbound I-205 are projected to operate at LOS F conditions from 2 PM to 8 PM by Year 2030. In addition to severe congestion on westbound I-205 during the morning peak period and eastbound I-205 during the evening peak period, the City of Tracy, Mountain House and San Joaquin County will experience a significant amount of cut-through traffic.

On the east side of the corridor, traffic volumes on SR 99 crossing the Stanislaus River are projected to increase from 118,000 to 200,000 vehicles (approximately 69% increase) between 2019 and 2040. This will result in the travel lanes on northbound SR 99 operating at LOS F conditions from 5 AM to 10 AM during the morning peak hour by Year 2030. During the evening peak period, the travel lanes on southbound SR 99 are projected to operate at LOS F conditions from 2 PM to 7 PM by Year 2030. In addition to severe congestion on SR 99, the City of Manteca, City of Ripon and San Joaquin County will face a significant amount of cut-through traffic.

Figure 5: Westbound I-580 – Mode Split



Sources: Mode Split in Three County Model and Caltrans Performance Measurement System (PeMS)

Figure 5 presents the mode split for Westbound I-580 just west of the I-205 / I-580 freeway to freeway interchange. The results of the analysis show that on a daily basis, about 70% of the vehicle trips are single occupancy vehicles, resulting in the multiple hours of congestion in the existing mixed flow travel lanes as single occupancy vehicles and trucks.

Without any existing carpool / transit lanes, the high occupancy mode split (11% carpool and 1% transit) that are traveling to and from the Central Valley to the San Francisco Bay Area are forced to use the same mixed flow travel lanes. The lack of dedicated carpool and transit facilities on I-205 significantly reduces the benefits of carpooling and taking transit in terms of travel time reliability and transit service on-time performance.

Under Existing Conditions, the average travel time during the morning peak hour from Interstate 5 to the I-580 / Grant Line Road interchange is approximately 40 minutes and can sometimes exceed one hour due to incidents or weather conditions. If a dedicated HOV / Transit lane was available, the travel times for carpool and transit vehicles would be reduced by 65% to approximately 15 minutes.

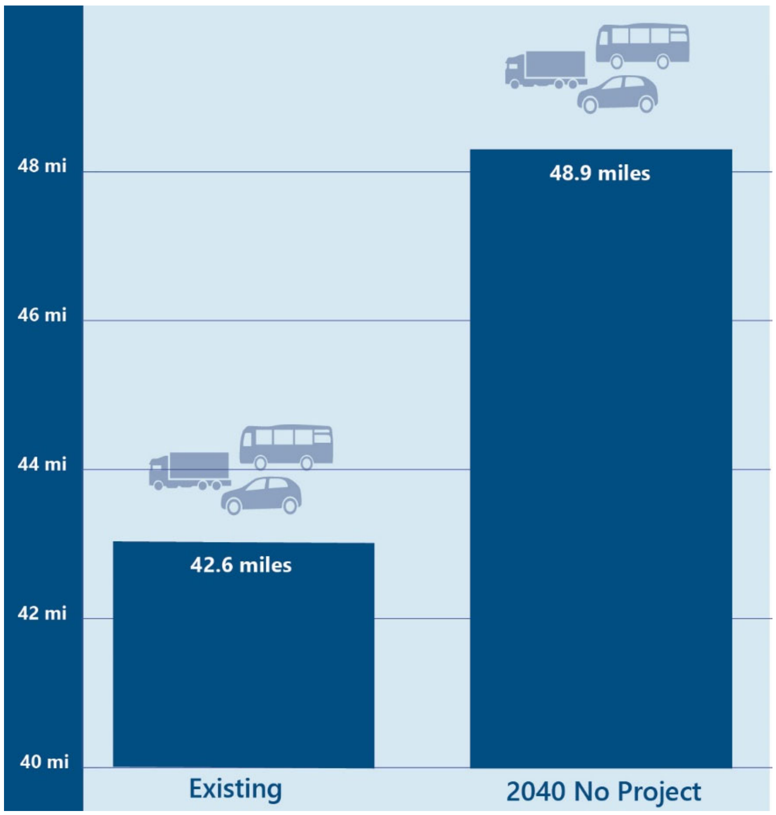
Lastly, with an ADT volume comprised of sixteen (16) percent truck traffic the shoulder lane operates at lower travel speeds and capacity due to the uphill grade in the westbound I-580 direction and the downhill grade in the eastbound direction. Normally, truck traffic avoids peak hour traffic, resulting in about eight (8) percent truck traffic during peak hours. But with the morning peak period starting by 5 AM and the evening peak period starting by 2 PM, congestion is compounded by the mix of cars and trucks in the project study area. Based on the Three County Model, without any multi-modal projects in the I-205, I-5, SR 120, SR 99 Congested Corridor Study Area, Daily Vehicle Miles Traveled (VMT) would increase 21% between Existing and Future (2040) on a typical weekday condition as shown in Figure 6.

Figure 6: Projected Increase in Daily VMT

Sources: Existing and 2040 No Project Three County Model Daily Vehicle Miles Traveled System (PeMS)

Based on the Three County Model, without any multi-modal projects in the I-205, I-5, SR 120, SR 99 Congested Corridor Study Area, Daily VMT Per Capita would increase almost 15% between Existing and Future (2040) on a typical weekday condition from 42.6 miles to 48.9 miles as shown in Figure 7 below.

Figure 7: Daily VMT Per Capita



Sources: Existing and 2040 No Project Three County Model

GOALS OF THE I-205, I-5, SR 120 AND SR 99 CONGESTED CORRIDOR PLAN

In order for transportation projects in the SJCOG region to successfully compete for SB1 funding, the following goals were identified by the Project Development Team:

- Reduce Congestion / Travel Time for all modes;
- Increase Carpooling, Transit, Rail, and Active Transportation (Bicycling and Walking) Options;
- Move people more efficiently through High Occupancy Vehicle (HOV or Carpooling), Transit and Rail Options;
- Improve Safety;
- Improve Accessibility;
- Create New Jobs; and
- Improve Air Quality.

The goal of this Congested Corridor Plan is to reduce traffic congestion and increase travel choices through a balanced set of transportation, environmental, and community access improvements. To attract the funding from the State's SB1 Solutions for Congested Corridors Program (SCCP) administered by the California Transportation Commission (CTC), a well-considered and coordinated plan which address the SCCP Indicators is required. Accordingly, the San Joaquin Council of Governments (SJCOG) and Caltrans have partnered to fund and lead the preparation of the I-205, I-5, SR 120 and SR 99 Congested Corridor Plan.

As part of developing the plan, public agencies with transportation roles along the corridor were invited to participate in a project development team (PDT) to help guide the plan. The Project Development Team was comprised of the following agencies:

- San Joaquin Council of Governments (SJCOG);
- Caltrans District 10;
- Stanislaus Council of Governments (StanCOG)
- Alameda County Transportation Commission (ACTC);
- San Joaquin County;
- Stanislaus County;
- San Joaquin Regional Rail Commission (SJRRC);
- San Joaquin Regional Transit District
- Tri-Valley San Joaquin Valley Regional Rail Authority
- City of Tracy;
- City of Lathrop;
- City of Manteca;
- City of Ripon.

In addition to the State's SCCP funding source, the following additional sources were identified as potential funding sources for the multi-modal projects included in the Congested Corridor Plan:

- SB1 – Trade Corridor Enhancement Program (TCEP);
- SB1 – Local Partnership Program (LPP);
- State Transportation Improvement Program (STIP);
    - Interregional Improvement Program (IIP);
    - Regional Improvement Program (RIP);
- Active Transportation Program (ATP);
- Transit and Intercity Rail Capital Program (TIRCP);
- Federal Competitive Funding; and
- Measure K Local Transportation Sales Tax Funding

GUIDELINES OF THE CONGESTED CORRIDOR PLAN

A set of guidelines and metrics were adopted by the California Transportation Commission (CTC) on January 29, 2020. Based on our review of the document, the following key factors were identified:

- The Commission intends to program two years of funding in the 2020 Program ($500,000,000) in fiscal years 2021-22 and 2022-23.
- No single award will exceed $100 million. It is the Commission's intent to fund one project each fiscal year in a jurisdiction with a population of 250,000 or less, not to exceed 15% of the funding available per fiscal year.
- The Congested Corridors Program will only fund projects, or segments of projects, that are fully funded, have independent utility, and will be ready to start construction by December 31, 2023.
- Funding is available for projects that make specific improvements designed to reduce congestion in highly traveled and highly congested corridors through performance improvements that balance transportation improvements, community impacts, and that provide environmental benefits.
- These improvements may be on the state highway system, local streets and roads, public transit facilities, bicycle and pedestrian facilities.
- It should be noted that General purpose lanes are not eligible for funding in the Solutions for Congested Corridors Program.

PROJECTS ELIGIBLE FOR CONGESTED CORRIDOR PLAN FUNDING

The following projects were identified by the CTC to be eligible for funding under the SB1 Solution for Congested Corridor Program:

- Addition of high-occupancy vehicle lanes and managed lanes.
- New or existing transit infrastructure improvements including: adding roadway capacity for improved transit service, such as bus-only lanes; traffic signal priority for improved bus or light rail service; adding rail capacity implementing other rail improvements; operational and/or safety improvements that allow for faster transit speeds, more reliable service, or more frequent service; improvements at transit stations that allow for improved safety, operational efficiency, or additional capacity.
- Adding new or improving existing rail infrastructure such as: construction of track siding to allow for trains to pass; adding railroad capacity by expanding the number of tracks serving the rail corridor; operational and/or safety improvements that allow for faster train speeds; improvements at rail stations that allow for improved safety, operational efficiency, or additional capacity.
- Transit hubs to increase linked trips or multimodal transportation modes.
- Transit hubs or stations and nearby roadways providing accessibility for first mile and last mile connectivity to public transit systems.
- Acquisition of buses, rail cars, locomotives, or other rolling stock, including zero-emission buses.
- Operational improvements such as: interchange and ramp modifications, auxiliary lanes for merging or weaving between adjacent interchanges, passing lanes, curve corrections and alignment improvements, truck climbing lanes, signals and/or intersection improvements, two-way left-turn lanes, channelization, turnouts, railroad at-grade crossings improvements or separations, shoulder widening.
- Closing gaps in the street network including general purpose mainline lanes on local streets.
- Safety improvements such as: wet pavement corrections, curve corrections, shoulder widening, high friction treatment, left turn channelization, safety barriers, new guardrail, end treatments and crash cushions, rumble strips, lighting, glare screen, rock fall mitigation, over crossing pedestrian fencing, or bikeways and crosswalk safety enhancements.
- Direct mitigation or other regulatory requirements of a transportation project or facility funded under the Congested Corridors Program, including restoration or protection of critical habitat and open space.
- Projects that employ advanced and innovative technology, like Intelligent Transportation Systems.
- Projects that include supporting infrastructure for deployment of current and future technologies.
- Transportation Management Systems and Transportation Demand Management.
- Bicycle facilities such as dedicated bicycle lanes, separated bikeways, bicycle parking, and secure storage.
- Pedestrian facilities, including: sidewalks, walkways, paths, driveways, crosswalks, median islands, ramps, pedestrian bridges and tunnels.

CHAPTER 2. DEVELOPMENT OF MULTI-MODAL PROJECTS

The following sections describe the multi-faceted approach in developing the final list of multi-modal projects. As a starting point, projects from the 2018 SJCOG Regional Transportation Plan / Sustainable Communities Strategy Plan Project List were identified for the project study area and additional project concepts to improve mobility, safety, air quality and economic development were identified by the Project Development Team in April 2019 and August 2019.

CONGESTED CORRIDOR PLAN PUBLIC WORKSHOPS

The results of the preliminary list of projects was summarized and the following four (4) workshops were held in September 2019:

- Lathrop, Manteca, Ripon, and unincorporated areas of San Joaquin County at the City of Manteca Transit Center;
- Tracy and unincorporated areas of San Joaquin County at the City of Tracy Transit Center;
- Mountain House at the Mountain House Community Services District Board Room; and
- SJCOG Citizen Advisory Committee at the SJCOG Board Room in Stockton

A combination of a workshop setting and PowerPoint presentation were used to present the preliminary list of multi-modal projects and request feedback / comments. Each of the meetings began with residents, business owners, and elected officials reviewing the list of projects and providing their thoughts to the project team, comment cards or emails. Then a PowerPoint presentation and a Question and Answer session was used to discuss the major elements of the multi-modal Plan.


EXIT

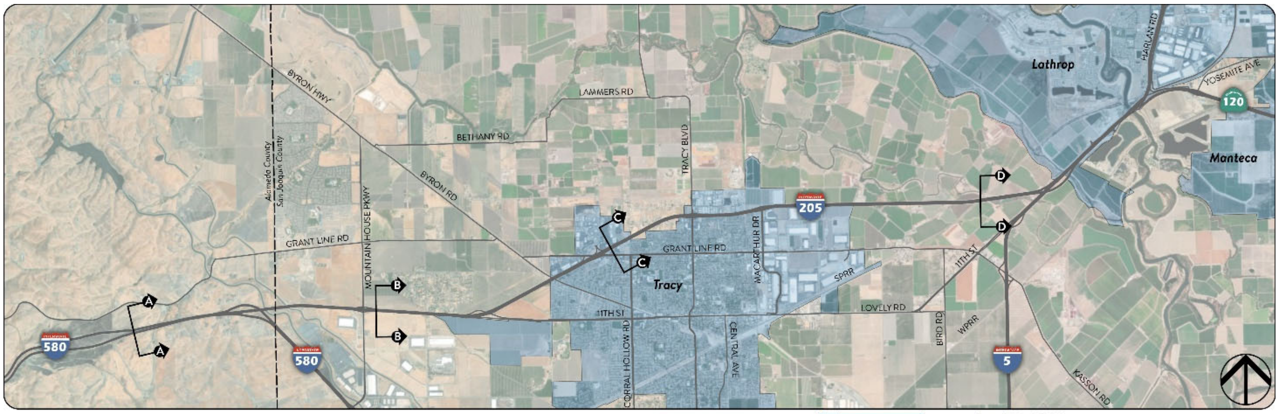
ADDITIONAL CONGESTED CORRIDOR PLAN OUTREACH

In addition to the four (4) workshops described above, the following outreach activities were completed to present information regarding the Congested Corridor Plan:

- November 5, 2019 – Summit on the Summit Meeting
- November 20, 2019 – San Joaquin Council of Governments Goods Movement Task Force
- November 8, 2019 – Rotary Club of Manteca Presentation
- January 31, 2020 - Delta College South Campus Presentation

INTERSTATE 205 CROSS SECTIONS

A part of the presentations was the development of the following concepts for the I-205 Corridor to serve more people that could be implemented in phases using high occupancy / express travel lanes (Figure 8), dedicated transit lanes, autonomous vehicle lanes, or reversible lanes, (Figure 9), and dedicated commuter rail (Figure 10).



Interstate 205 Cross Section Locations

The sections below include added capacity along mainline I-205, via High Occupancy Vehicle (HOV) and/or High Occupancy Toll (HOT) travel lanes along with an expanded median to allow for the multi-modal options listed above. These multi-modal options could be included as part of the I-205 Corridor Improvement Project or identified as preserved right-of-way for future multi-modal options in the I-205 Corridor.

Section AA is defined as the area west of the I-205 / I-580 interchange, west of the I-205 / Grant Line Road interchange. In this section of I-205, there is approximately 410 feet of right of way with a 164 clear width between travel lanes (144 foot median with 10 foot shoulders on each side).

Section BB is defined as the area east of the I-205 / Mountain House Parkway interchange. In this section of I-205, there is approximately 227 feet of right of way with a 66 clear width between travel lanes (46 foot median with 10 foot shoulders on each side).

Section CC is defined as the area east of the I-205 / Grant Line Road interchange. In this section of I-205, there is approximately 231 feet of right of way with a 66 clear width between travel lanes (46 foot median with 10 foot shoulders on each side).

Section DD is defined as the area east of the I-205 / Paradise Cut area heading towards Interstate 5. In this section of I-205, there is approximately 297 feet of right of way with a 66 clear width between travel lanes (46 foot median with 10 foot shoulders on each side).

Figure 8: Interstate 205 Cross Sections – HOV or Express Lanes Only

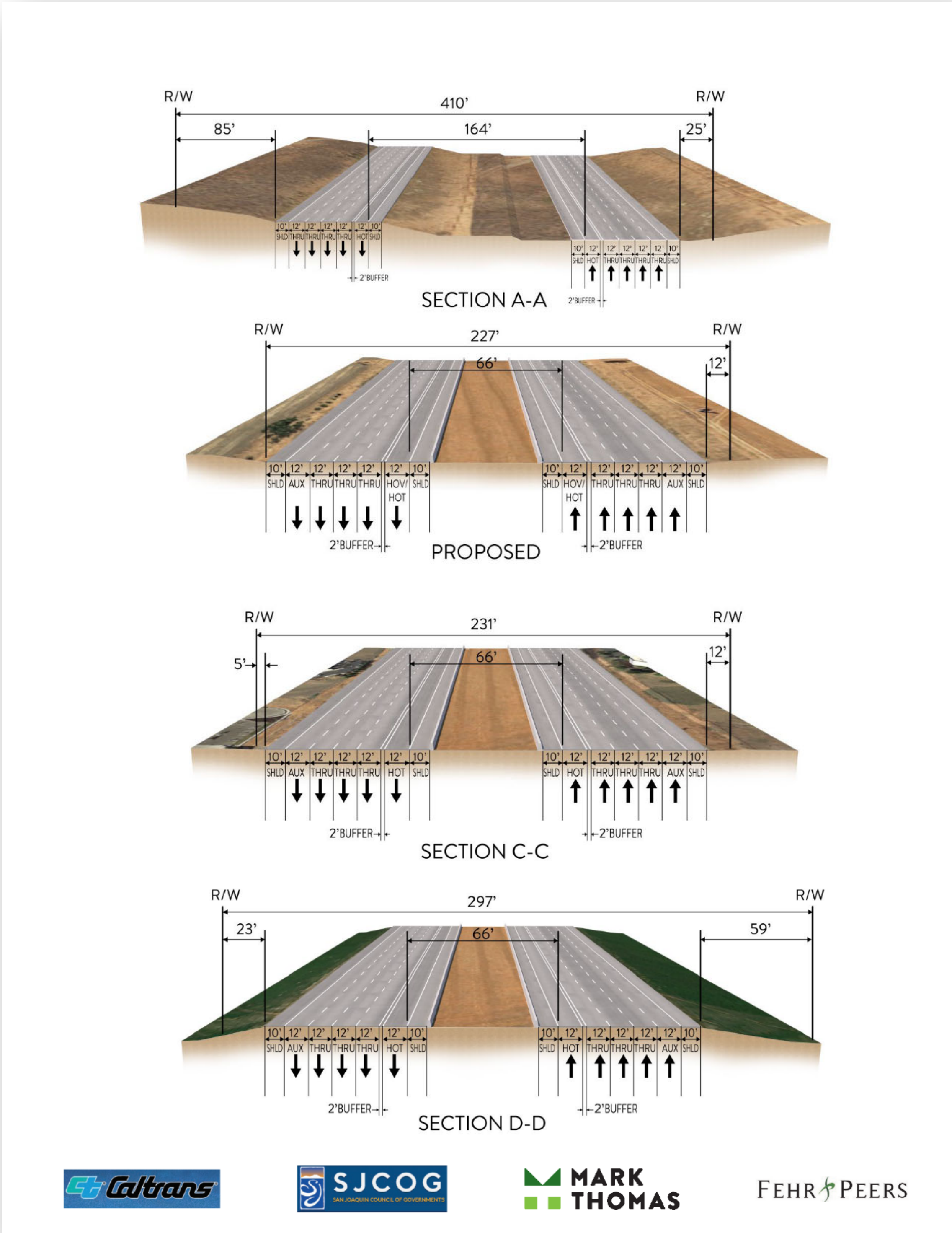


Figure 9: Interstate 205 Cross Sections – HOV or Express Lanes with Dedicated Transit Only Lane

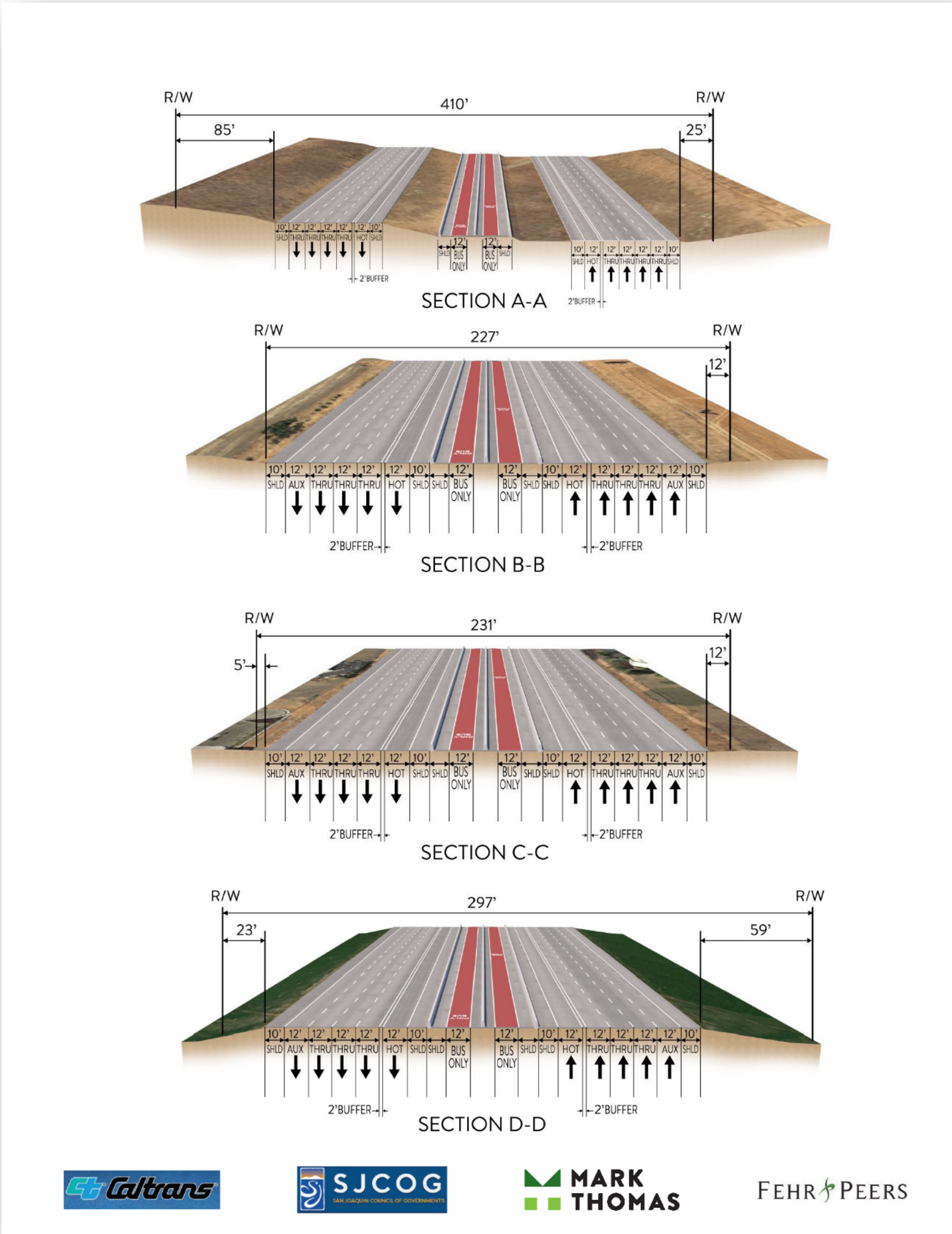
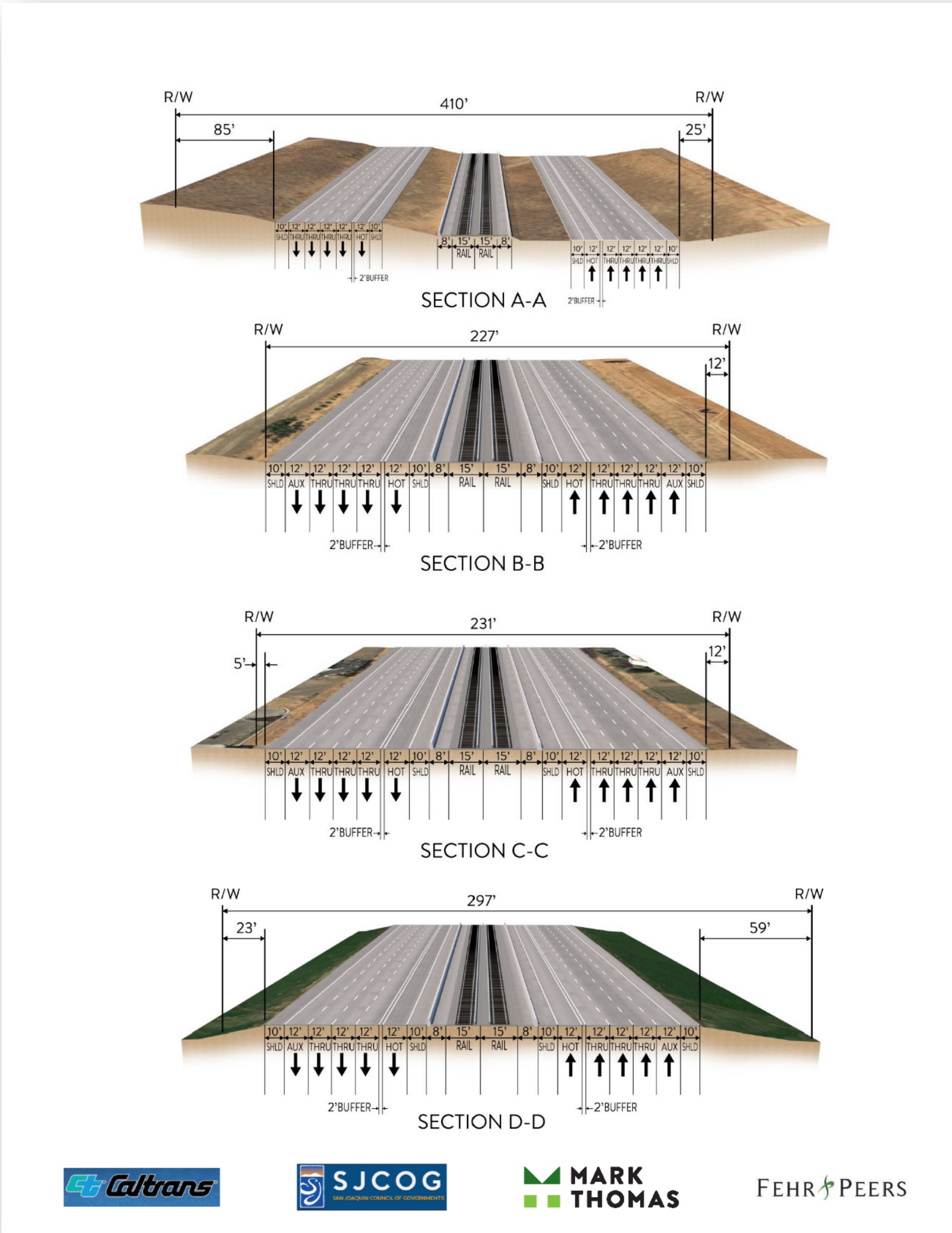


Figure 10: Interstate 205 Cross Sections – HOV or Express Lanes with Dedicated Commuter Rail



MAJOR THEMES OF PUBLIC WORKSHOPS

Based on the four workshops and comments received from stakeholders regarding the I-205, I-5, SR 120 and SR 99 Congested Corridor Plan, the following major themes were identified:

- Major consensus on improving multi-modal travel options;
- Passenger Rail (ACE, I-205 Fixed Guideway or Valley Link);
- Increasing person throughput via High Occupancy Vehicle and Express Transit Lanes;
- Major opportunity for reversible HOV/HOT travel lanes (2 WB AM and 2 EB PM);
- Need to address truck traffic impacts during peak hours;
- Increased local and regional efforts to bring more jobs (technology, medical, etc.) to San Joaquin County; and
- Interagency coordination with Alameda County Transportation Commission (ACTC) and Caltrans District 4.

I-205, I-5, SR 120 AND SR 99 CONGESTED CORRIDOR PLAN MULTI-MODAL PROJECTS

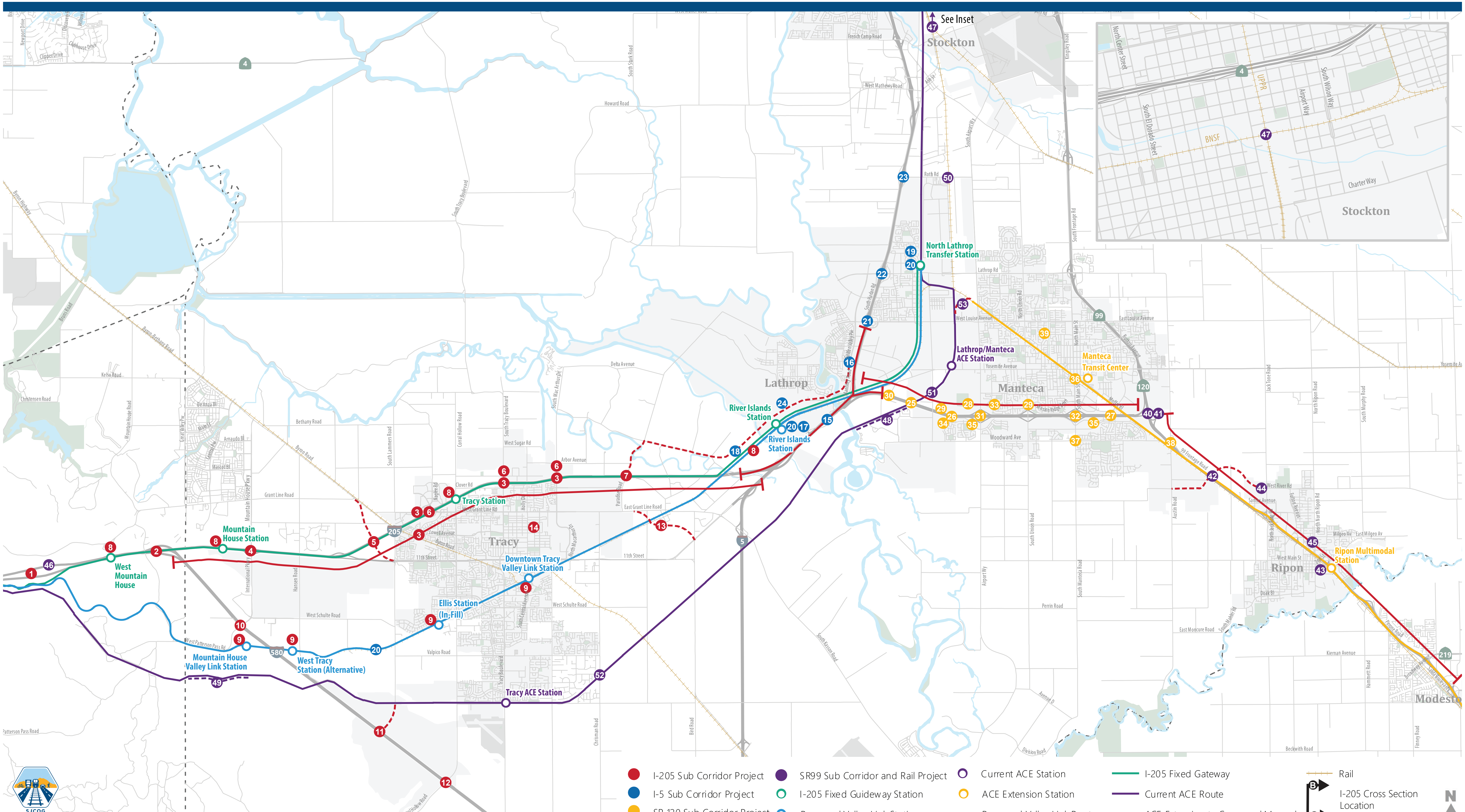
The following sections describe the multi-modal projects for I-205, I-5, SR 120, and SR 99. **Figure 11** presents the fifty-three (53) projects on Interstate 205, Interstate 5, State Route 120, and State Route 99.

It should be noted that per Caltrans Policy Directive, reversible lanes will be included as a project alternative of the I-205 Managed Lanes PR/ED that will be led by SJCOG in coordination with Caltrans, City of Tracy, San Joaquin County, and Alameda County Transportation Commission.

<u>The Interstate 205 Sub-Area</u> is defined at the section of the regional transportation system that stretches from the Interstate 580 / Greenville Road interchange in Alameda County, through the Altamont Pass and the Interstate 205 / Interstate 5 freeway to freeway interchange in the City of Tracy / San Joaquin County. The following fourteen (14) multi-modal projects were identified by the Project Development Team:

1. High Occupancy Vehicle (Carpool) / Express Lane from I-580/Greenville Road Interchange to I-580/Grant Line Road Interchange
    a. Westbound I-580 Truck Climbing Lane
2. High Occupancy Vehicle (Carpool) / Express Lane from I-580/Grant Line Road Interchange to County Line
3. High Occupancy Vehicle (Carpool) / Express Lane from County Line to I-5
    a. Identify locations for park-and-ride and truck rest areas
    b. I-205/Grant Line Road Interchange Improvements
        i. Add eastbound loop on ramp, realign eastbound off ramp, restripe Grant Line Road to six lanes
        ii. Class IV Bicycle Facilities between Power Road and Henley Parkway along with new park and ride lot

Figure 11: Congested Corridor Plan Multi-Modal Projects



The Interstate 205 Sub-Area multi-modal projects continued:

3. High Occupancy Vehicle (Carpool) / Express Lane from County Line to I-5 (continued)
    c. I-205/Tracy Blvd Interchange Improvements
        i. Reconstruct tight diamond interchange, add Class II bike lanes between Clover Road and Larch Road
    d. I-205/MacArthur Drive Interchange Improvements
        i. Reconstruct tight diamond interchange
4. I-205/Mountain House Parkway/International Parkway Interchange Improvements
    a. Add Park & Ride Lot
5. New I-205/Lammers Road/Eleventh Street Interchange and Ramp Metering
6. Ramp Metering at I-205/Grant Line, I-205/Tracy Blvd, and I-205/MacArthur Interchanges
7. New I-205/Chrisman Road interchange
8. Fixed Guideway Concept on I-205/I-580 from Grant Line Road to Paradise Cut
    a. Potential stations/park and ride lots at I-580/Grant Line Road Interchange, west of Mountain House Parkway/I-205 Interchange, I-205/Corral Hollow Road
9. Valley Link track construction and stations at Mountain House, Downtown Tracy and Paradise Cut as identified in feasibility study (October 2019)
10. I-580/International Parkway/Patterson Pass Road Interchange Improvements and Ramp Metering
11. New I-580/Lammers Road interchange and Ramp Metering
12. I-580/Corral Hollow Road Interchange Improvements and Ramp Metering
13. Grant Line Road Corridor
14. Integrated Corridor Management Plan implementation

The Interstate 5 Sub-Area is defined at the section of the regional transportation system that stretches from the Interstate 205 / Interstate 5 freeway to freeway interchange in the City of Tracy / San Joaquin County, through the Mossdale Area to the Stockton Diamond Rail Intersection. The following ten (10) multi-modal projects were identified by the Project Development Team:

15. I-5 Mossdale Widening
    a. High Occupancy Vehicle (Carpool) / Express Lane from I-205 to Louise Avenue, with direct HOV connector to I-205
    b. High Occupancy Vehicle (Carpool) / Express Lane from I-205 to SR 120, with direct HOV connectors to I-205 and SR 120
    c. Close Manthey Road/Mossdale Road hook ramps
    d. Construct Manthey Road/Toleri Road two-lane local road with Class II Bike Lanes
16. Manthey Road Bridge Replacement and Golden Valley Parkway construction
17. Valley Link / Fixed Guideway station at River Islands in Lathrop, CA
18. Golden Valley Parkway Improvements from Manthey Road to New I-5 / Chrisman Road interchange
19. North Lathrop Transfer Station at Sharpe Army Depot (ACE/Valley Link)

The Interstate 5 Sub-Area multi-modal projects continued:

20. Valley Link track construction as identified in feasibility study (October 2019) between I-205 / Paradise Cut and North Lathrop Transfer Station
21. I-5/Louise Avenue Interchange Improvements and ramp metering
22. I-5/Lathrop Road Interchange Improvements and ramp metering
23. I-5 / Roth Road interchange improvements and ramp metering
24. Integrated Corridor Management Plan implementation

The State Route 120 Sub-Area is defined at the section of the regional transportation system that stretches from the Interstate 5 / State Route 120 freeway to freeway interchange in the City of Lathrop / City of Manteca to the west and the State Route 120 / State Route 99 freeway to freeway interchange in the City of Manteca / San Joaquin County to the east. The following fifteen (15) multi-modal projects were identified by the Project Development Team:

25. Auxiliary lanes between Yosemite Avenue and McKinley Avenue Interchanges
26. Auxiliary lanes between McKinley Avenue and Airport Way interchanges
27. Auxiliary lanes between Main Street and SR 99 interchanges
28. 120 Widening to 6 Lanes between SR 99 and Airport Way and identify location for park-and-ride and truck rest area
29. SR 120 widening to 8 lanes with High Occupancy Vehicle (Carpool) / Express Lane between Airport Way and I-5
30. SR 120 / Yosemite Avenue Interchange Improvements
31. Reconstruct Airport Way interchange to Diverging Diamond Interchange with Class I Bike Path grade-separated path
32. Reconstruct Main Street interchange to Diverging Diamond Interchange with Class I Bike Path grade-separated path
33. Ramp Metering on SR 120 between I-5 and SR 99
34. Extend Atherton Drive from Hearthstone Drive to McKinley Avenue (4 lanes with Class I Bike Path)
35. Close remaining gaps on Atherton Drive Class I Bike path
36. Expand parking at Manteca Transit Center and construct platform for ACE
37. Install traffic signal at Main Street/Woodward Avenue
38. SR 99/120 Connector Project Phase 1A
39. Integrated Corridor Management Plan implementation

The State Route 99 Sub-Area, Passenger Rail Service, and Freight Rail Improvements is defined at the section of the regional transportation system that stretches from the I State Route 120 / State Route 99 freeway to freeway interchange in the City of Manteca / San Joaquin County to the north and the State Route 99 / Kiernan Avenue interchange in Stanislaus County to the South. The following six (6) multi-modal projects were identified by the Project Development Team. In addition, eight (8) Passenger Rail Service and Freight Rail improvements were identified by the Project Development Team:

The State Route 99 Sub-Area, Passenger Rail Service, and Freight Rail Improvements multi-modal projects:

40. SR 99/120 Connector Project Phase 1B
    a. Widen connector from northbound SR 99 to westbound SR 120 to 2 lanes
    b. Add westbound merge lane on SR 120 between SR 99/120 and Main Street Interchange
    c. Construct new EB SR 120 to NB SR 99 connector
41. SR 99/120 Connector Project Phase 1C
    a. Add eastbound lane on SR 120 between Main Street and SR 99/120
    b. Add auxiliary lanes on SR 99
    c. Add braided ramps at SR 99/Austin Road Interchange
42. SR 99 Widening
    a. Identify locations for park-and-ride and truck rest areas on SR 99 between SR 120 and Kiernan Avenue (SR 219)
    b. Widen from 6 to 8 lanes (HOV/HOT) between Yosemite Avenue (SR 120 East) and Kiernan Avenue (SR 219)
    c. Construct High Occupancy Vehicle (Carpool) / Express Lane direct connectors to/from SR 120 to southbound SR 99
    d. Construct High Occupancy Vehicle (Carpool) / Express Lane direct connectors to/from SR 120 to northbound SR 99
    e. Construct SR 99/Raymus Expressway/River Road interchange
    f. Auxiliary lanes between Yosemite Avenue, SR 120 West, Austin Road, Raymus/River, Jack Tone, Milgeo, Main Street, and Hammatt interchanges
43. Construct Ripon Multimodal Station on Industrial Drive at UPRR
44. Extend 6 lane River Road with Class I Bike Path to SR 99/Raymus/River Road interchange
45. Integrated Corridor Management Plan implementation
46. Improvements necessary for a 5th and 6th ACE train over the Altamont Pass
47. Stockton Diamond Grade Separation (UP Fresno Sub/BNSF Stockton Sub)
48. Extension of Wyche Siding on UP Oakland Subdivision (near existing Lathrop/Manteca ACE Station)
49. Extension of Midway Siding on UP Oakland Subdivision (near Midway Road)
50. Roth Road / Union Pacific Oakland Subdivision Grade Separation
51. McKinley Avenue / Union Pacific Oakland Subdivision Grade Separation (near Daniels Street)
52. Chrisman Road / Union Pacific Oakland Subdivision Grade Separation (near Bates Road)
53. Lathrop Wye Rail Connection

CHAPTER 3. ANALYSIS OF THE MULTI-MODAL PROJECTS

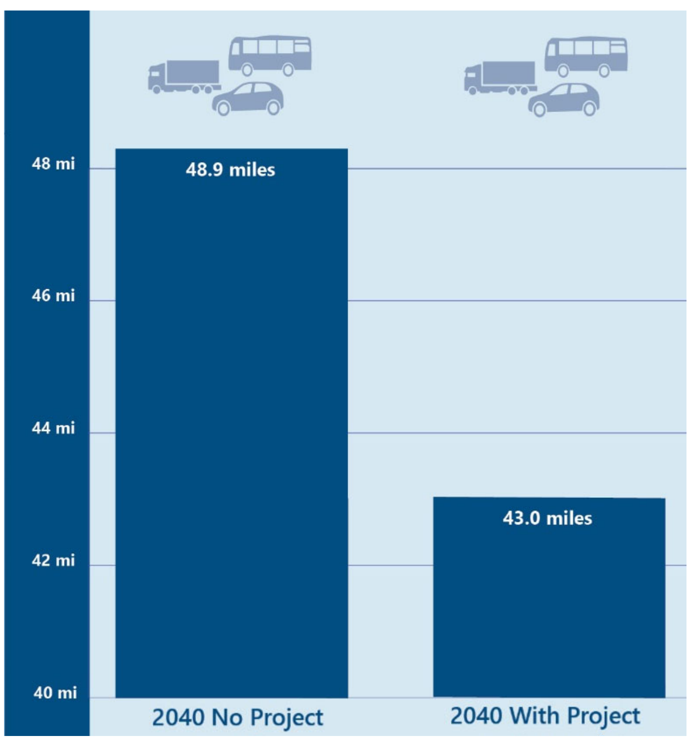
Using CUBE software's Geographic Information System (GIS) interface with the Three County Model, each of the fifty-three (53) projects identified above were geo-coded into the Future (2040) No Project Regional Travel Demand Model. In order to determine the benefits of the projects for each of the following metrics:

- Congestion;
- Throughput;
- Safety;
- Accessibility;
- Air Quality / GHG;
- Economic Development;
- Efficient Land Use;

In order to determine the benefits of the Congested Corridor Plan, an area of regional benefit was defined and is shown in the highlighted area in Figure 11. This area captures every regional and inter-regional multi-modal trip to determine the benefits of the Congested Corridor Plan.

Figure 12 shows that results of the Year 2040 With Projects in terms of Daily VMT Per Capita. With the 53 multi-modal projects, Daily VMT Per Capita would decrease from 48.9 Miles to 43.0 Miles, an overall decrease of twelve (12) percent when compared to No Project Conditions.

Figure 12: Daily VMT Per Capita



Source: 2040 No Project and 2040 with Project Three County Model

Figure 13: I-205, I-5, SR 120 and SR 99 Congested Corridor Project Multi-Modal CUBE Network

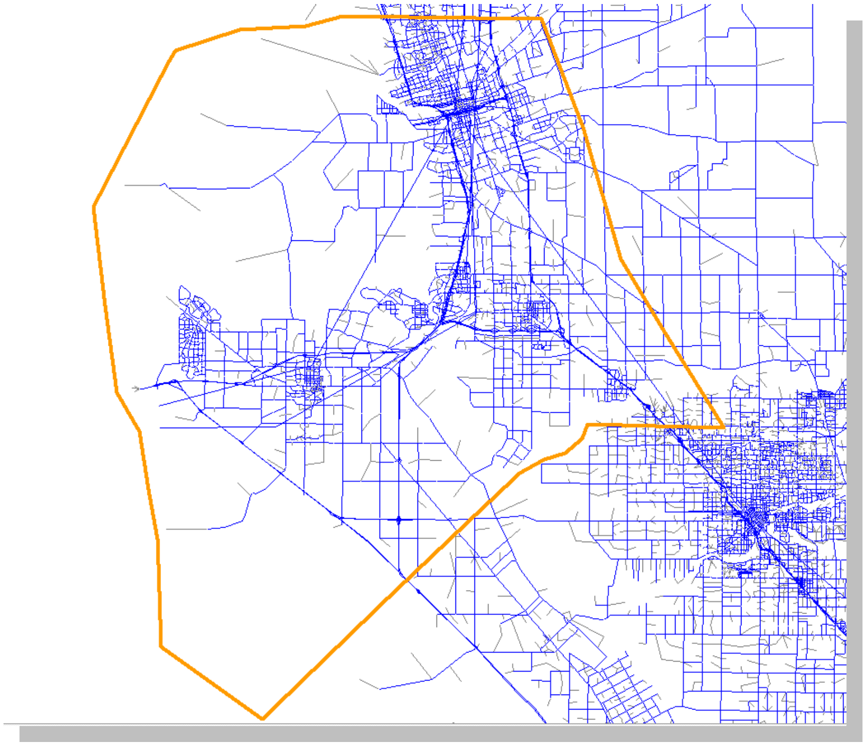


Figure 13 shows the area of the Three County Model that was examined for the projected VMT decrease in the project study area as a result of implementing the multi-modal projects. On a weekday daily basis, the projected increase in high occupancy vehicles, transit, commuter rail, bicycle and pedestrian transportation options would result in a reduction of 3,810,034 miles, a 12% reduction when compared to No Project Conditions.

WEEKDAY DAILY FUEL AND VEHICLE EMISSION BENEFITS

With the completion of the 53 Congested Corridor Projects, the following weekday daily benefits in terms of reduced VMT and fuel consumption would occur:

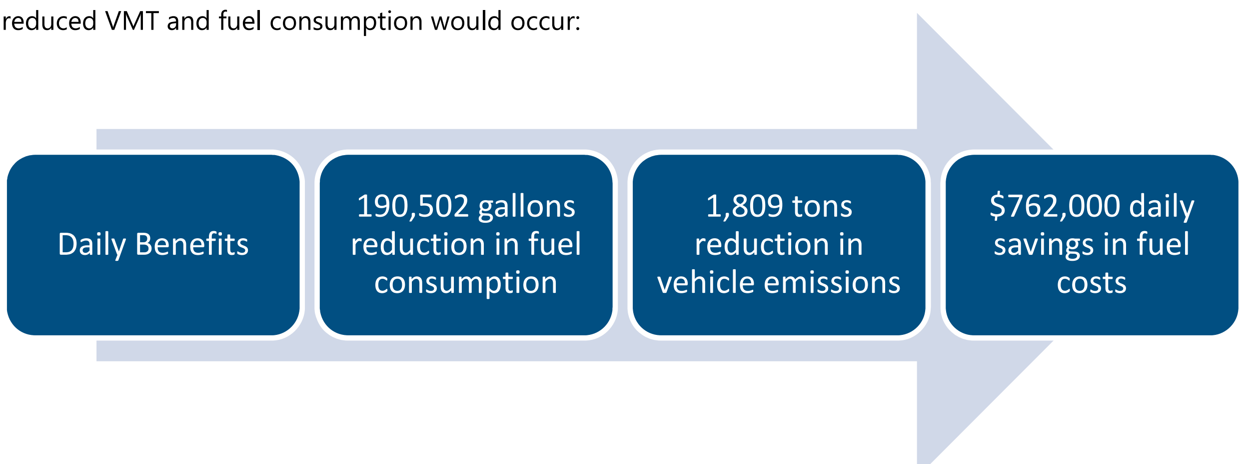
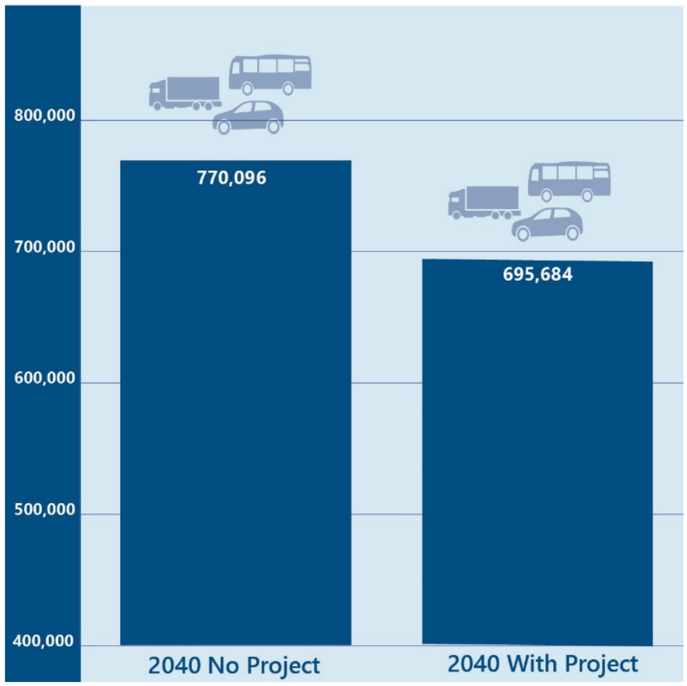


Figure 14 presents the projected Vehicle Hours of Delay (VHD) decrease in the project study area as a result of implementing the multi-modal projects that increase the use of high occupancy vehicles, transit, commuter rail, bicycle and pedestrian transportation options. On a weekday daily basis, the Future Year 2040 Projects would result in a reduction of 74,412 Hours, a 10% reduction when compared to No Project Conditions.

Figure 14: Projected Decrease in Daily VHD



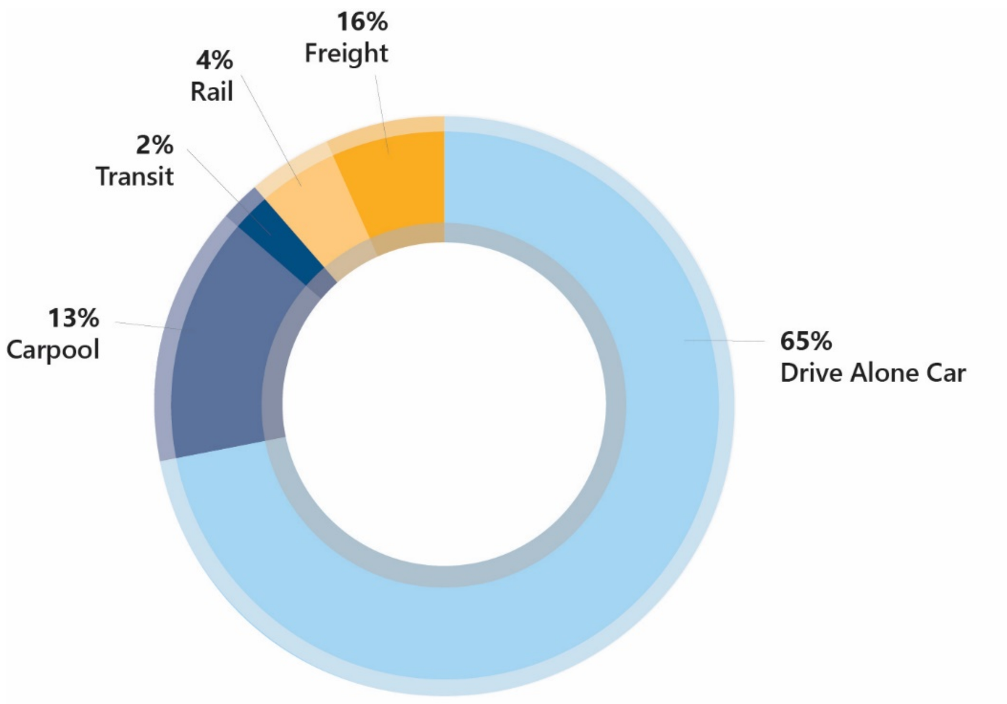
Source: 2040 No Project and 2040 with Project Three County Model

WEEKDAY DAILY DELAY AND LOST PRODUCTIVITY BENEFITS

Without any improvements in the project study area, drivers would spend a total of 74,412 hours of time, or an average of 45 minutes in congestion during a typical weekday. Implementing the multi-modal projects that provide travel time and reliability improvements for carpool, transit, and rail, would result in major benefits in terms of reduced Vehicle Hours of Delay. With an average cost of $15 dollars per hour of lost productivity, the Congested Corridor Plan would realize $1.1 million in increased productivity when compared to No Project conditions.

Figure 15 presents the mode split for Westbound I-580 just west of the I-205 / I-580 freeway to freeway interchange as a result of implementing the multi-modal projects that increase the use of high occupancy vehicles, transit, commuter rail, bicycle and pedestrian transportation options.

Figure 15: Westbound 1-580 – Mode Split with Multi-Modal Projects



Source: Mode Split in 2040 with Project Three County Model

The results of the analysis show that on a daily basis, single occupancy vehicles mode split would decrease from 70% (Existing) to 65% (2040 With Project), a reduction of five (5) percent. With the construction of carpool / express / transit / rail lanes, the high occupancy mode split would increase from a total of 11% carpool, 1% transit, and 2% rail (Existing) to 13% carpool, 2% transit and 4% rail (2040 With Project). This represents an 18 % increase in carpooling, 100% increase in transit and a 100% increase in rail travel modes.

CONGESTED CORRIDOR PLAN BENEFIT TO COST RATIO

In terms of fuel and lost productivity, the projected benefits of $1.862M for a weekday daily basis was used to determine the cost to benefit ratio of the 53 multi-modal projects included in the I-205, I-5, SR 120 and SR 99 Congested Corridor Plan. With a total cost exceeding $7.1214 Billion in 2019 dollars, the overall benefit was determined to be approaching $12.7 billion between 2019 and 2040. It should be noted that this based on a 2.4 percent increase in the cost for fuel and lost productivity over the next 21 years.

The results of the cost benefit analysis showed that the 53 multi-modal projects included in the I-205, I-5, SR 120 and SR 99 Congested Corridor Plan would have a Benefit to Cost (B/C) ratio of 1.78 and would have a twelve (12) year payback period based on the projected savings in fuel consumption and lost productivity between 2019 and 2030.

CHAPTER 4. PHASING OF CONGESTED CORRIDOR PLAN MULTI-MODAL PROJECTS

The next step of this study was to analyze and recommend a group of projects that could be implemented in the Short-Term (2025), Mid-Term (2030) and Long-Term (2035) that provide the largest improvement for the I-205, I-5, SR 120 and SR 99 Corridor. Tables 1A through 1D presents the results of the benefits of the projects for each of the following metrics:

- Congestion Reduction;
- Throughput;
- System Reliability;
- Safety;
- Economic Vitality;
- Air Quality / GHG;
- Accessibility;
- Cost Effectiveness; and
- Efficient Land Use;

Appendix C presents the methodology for the quantitative and qualitative analysis evaluation criteria used for each of the measures used in the Regional Benefits Tables 1A through 1E. The recommended projects were determined based on benefit score, constructability and cost. It should be noted that in order to equally evaluate each of the multi-modal projects, a numeric scoring of High Benefit (5), Medium Benefit (3) and Low Benefit (1) was used. The following quantitative and qualitative analysis evaluation criteria were used for each of the measures:

<u>Congestion</u> – Does the project reduce Region-wide Total VMT

- Does the project reduce VMT per Capita
- Does the project reduce Daily Vehicle Hours of Delay?
- Does the project reduce Total Person Hours of Delay Per Year?

<u>Throughput</u> – Does the project increase Person Throughput by Applicable Mode?

- Does the project increase passengers per transit/rail vehicle service hour?
- Does the project increase bicycle / pedestrian accessibility?

<u>Safety</u> – Does the project reduce the potential for collisions?

- Does the project decrease collision severity and costs?

<u>Air Quality / GHG</u> – Does the project reduce fuel consumption?

- Does the project reduce total emissions?

<u>Economic Development</u> – Does the project create jobs?

- Does the project improve jobs to housing balance?
- Does the project increase accessibility to jobs and key destinations?

<u>Efficient Land Use</u> – Does the project support the goals of the SJCOG RTP/SCS?

- Does the project support in-fill mixed-use development with multi-modal choices?
- Does the project reduce VMT and congestion by placing more individuals within walking distance of jobs, services, retail or transit/rail?

Table 1A.
Solutions for Congested Corridors Improvement Projects – Regional Benefits

Improvement Project	Congestion Reduction	Throughput	Safety	Accessibility	Air Quality / GHG	Economic Development	Efficient Land Use	Total	Cost ($ M)
1. High Occupancy Vehicle (Carpool) / Express Lane from I-580/Greenville Road Interchange to I-580/Grant Line Road Interchange	5	5	5	5	5	5	5	35	$500.0
2. High Occupancy Vehicle (Carpool) / Express Lane from I-580/Grant Line Road Interchange to County Line	5	5	5	5	5	5	5	35	$168.0
3. High Occupancy Vehicle (Carpool) / Express Lane from County Line to I-5	5	5	5	5	5	5	5	35	$500.0
4. I-205/Mountain House Parkway/International Parkway Interchange Improvements	3	3	1	1	1	5	3	17	$49.4
5. New I-205/Lammers Road/Eleventh Street Interchange	3	3	3	1	1	3	3	17	$56.7
6. Ramp Metering at I-205/Grant Line, I-205/Tracy Blvd, and I-205/MacArthur interchanges	3	3	3	3	3	1	3	17	$51.0
7. New I-205/Chrisman Road Interchange	3	3	3	1	1	3	3	17	$40.4
8. Fixed Guideway Concept on I-205/I-580 from Grant Line Road to Paradise Cut	5	5	5	5	5	5	5	35	$1,135.0
9. Valley Link track construction and stations at Mountain House and Downtown Tracy	5	5	5	5	5	5	5	35	$1,590.0
10. I-580/International Parkway/Patterson Pass Road Interchange Improvements and Ramp Metering	3	3	1	1	1	5	3	17	$44.2
11. New I-580/Lammers Road Interchange and Ramp Metering	3	3	1	1	1	5	3	17	$55.6

Sources: Scoring: High Benefit (5), Medium Benefit (3), Negligible Benefit (1)

Table 1B.
Solutions for Congested Corridors Improvement Projects – Regional Benefits

Improvement Project	Congestion Reduction	Throughput	Safety	Accessibility	Air Quality / GHG	Economic Development	Efficient Land Use	Total	Cost ($ M)
12. I-580/Corral Hollow Road Improvements and Ramp Metering	3	3	1	1	1	5	3	17	$56.0
13. Grant Line Road Corridor	3	3	3	1	1	3	3	17	$30.8
14. I-205 Integrated Corridor Management Plan Implementation	5	5	5	3	5	3	5	31	$48.0
15. I-5 Mossdale Widening	5	5	3	5	5	3	3	29	$308.0
16. Manthey Road Bridge Replacement and Golden Valley Parkway Construction	1	1	1	1	1	1	3	9	$48.4
17. Valley Link / Fixed Guideway Station at River Islands in Lathrop, CA	3	3	1	3	3	5	5	23	$11.2
18. Golden Valley Parkway Improvements from Manthey Road to New I-5 / Chrisman Road	3	3	1	1	1	3	3	15	$16.5
19. North Lathrop Transfer Station at Sharpe Army Depot (ACE/Valley Link)	3	3	1	3	3	5	5	23	$28.3
20. Valley Link Construction and Stations as Identified in Feasibility Study between I-205 and North Lathrop	5	3	5	5	5	5	5	33	$11.5
21. I-5/Louise Avenue Interchange Improvements and Ramp Metering	3	3	1	1	1	5	3	17	$32.0
22. I-5/Lathrop Road Interchange Improvements and Ramp Metering	3	3	1	1	1	5	3	17	$41.5
23. I-5/ Roth Road interchange Improvements and Ramp Metering	3	3	1	1	1	5	3	17	$18.6
24. I-5 Integrated Corridor Management Plan Implementation	3	3	3	3	3	3	5	23	$22.4

Sources: Scoring: High Benefit (5), Medium Benefit (3), Negligible Benefit (1)

Table 1C.
Solutions for Congested Corridors Improvement Projects – Regional Benefits

Improvement Project	Congestion Reduction	Throughput	Safety	Accessibility	Air Quality / GHG	Economic Development	Efficient Land Use	Total	Cost ($ M)
25. Auxiliary Lanes between Yosemite Avenue and McKinley Avenue Interchanges	1	1	3	1	1	3	3	13	$3.9
26. Auxiliary Lanes between McKinley Avenue and Airport Way Interchanges	1	1	3	1	1	3	3	13	$3.9
27. Auxiliary Lanes between Main Street and SR 99 Interchanges	1	1	3	1	1	3	3	13	$10.0
28. SR 120 Widening to 6 Lanes between SR 99 and Airport Way and identify location for park-and-ride and truck rest area	5	5	3	5	3	5	5	31	$62.7
29. SR 120 Widening to 8 Lanes with High Occupancy Vehicle (Carpool) / Express Lane between Airport Way and I-5	5	5	3	5	3	5	5	31	$31.1
30. SR 120 / Yosemite Avenue Interchange Improvements	1	1	3	1	1	3	3	13	$33.7
31. Reconstruct Airport Way Interchange to Diverging Diamond Interchange with Class I Bike Path Grade-Separated Path	1	1	3	1	1	3	3	13	$28.0
32. Reconstruct Main Street Interchange to Diverging Diamond Interchange with Class I Bike Path Grade-Separated Path	1	1	3	1	1	3	3	13	$28.0
33. Ramp Metering on SR 120	3	3	3	3	3	1	3	17	$7.1
34. Extend Atherton Drive from Hearthstone Drive to McKinley Avenue (4 Lanes with Class I Bike Path)	1	1	3	1	1	1	3	11	$4.5
35. Close Remaining Gaps on Atherton Drive Class I Bike Path	1	1	3	1	1	1	3	11	$5.6

Sources: Scoring: High Benefit (5), Medium Benefit (3), Negligible Benefit (1)

Table 1D.
Solutions for Congested Corridors Improvement Projects – Regional Benefits

Improvement Project	Congestion Reduction	Throughput	Safety	Accessibility	Air Quality / GHG	Economic Development	Efficient Land Use	Total	Cost ($ M)
36. Expand parking at Manteca Transit Center and construct platform for ACE	3	3	1	3	3	1	5	19	$10.4
37. Install traffic signal at Main Street/Woodward Avenue	3	1	3	1	1	1	1	11	$1.1
38. SR 99/120 Connector Project Phase 1A	5	5	5	5	5	5	3	33	$51.4
39. SR 120 Integrated Corridor Management Plan implementation	3	3	3	1	3	3	5	21	$22.4
40. SR 99/120 Connector Project Phase 1B	5	5	5	5	5	5	3	33	$34.9
41. SR 99/120 Connector Project Phase 1C	3	3	3	3	3	3	3	21	$65.9
42. SR 99 Widening with High Occupancy Vehicle (Carpool) / Express Lane	5	5	5	5	5	5	3	33	$563.5
43. Construct Ripon Multimodal Station on Industrial Drive at UPRR	3	3	1	3	3	1	5	19	$14.1
44. Extend 6 lane River Road with Class I Bike Path to SR 99/Raymus/River Road interchange	1	1	3	1	1	1	3	11	$89.6
45. SR 99 Integrated Corridor Management Plan implementation	5	5	5	3	3	3	5	29	$21.5

Sources: Scoring: High Benefit (5), Medium Benefit (3), Negligible Benefit (1)

Table 1E.
Solutions for Congested Corridors Improvement Projects – Regional Benefits

Improvement Project	Congestion Reduction	Throughput	Safety	Accessibility	Air Quality / GHG	Economic Development	Efficient Land Use	Total	Cost ($ M)
46. Improvements necessary for a 5th and 6th ACE train over the Altamont Pass	3	3	3	3	3	5	5	25	$103.0
47. Stockton Diamond Grade Separation (UP Fresno Sub/BNSF Stockton Sub)	5	5	5	5	5	5	5	35	$272.1
48. Extension of Wyche Siding on UP Oakland Subdivision (near existing Lathrop/Manteca ACE Station)	3	1	1	3	1	3	3	15	$10.0
49. Extension of Midway Siding on UP Oakland Subdivision (near Midway Road)	3	1	1	3	1	3	3	15	$4.5
50. Roth Road / Union Pacific Oakland Subdivision Grade Separation	3	1	5	3	1	3	3	19	$32.6
51. McKinley Avenue / Union Pacific Oakland Subdivision Grade Separation (near Daniels Street)	3	1	5	3	1	3	3	19	$44.2
52. Chrisman Road / Union Pacific Oakland Subdivision Grade Separation (near Bates Road)	3	1	5	3	1	3	3	19	$44.2
53. Lathrop Wye Rail Connection	3	3	3	3	1	3	3	18	$6.6
							Total Cost ($ M)	$6,474.00	
							10 % Contingency	$647.40	
							Total Preliminary Cost ($ M)	$7,121.40	

Sources: Scoring: High Benefit (5), Medium Benefit (3), Negligible Benefit (1)

In terms of Land Use Efficiency, the integration of a greater mix of uses into congested corridors, efficient land use reduces vehicle miles traveled and congestion by placing more individuals within walkable distance to daily or regular destinations, such as jobs, services, retail, or transit. For purposed of the SB1 Congested Corridor Plan Guidelines, projects meeting the Efficient Land Use metric should support infill projects and mixed-use development with multi-modal choices. Appendix C also includes information regarding the data used in the Life Cycle Cost / Benefit analysis for the eleven (11) recommended projects described in the following sections.

RECOMMENDED SHORT-TERM (2025) PROJECTS

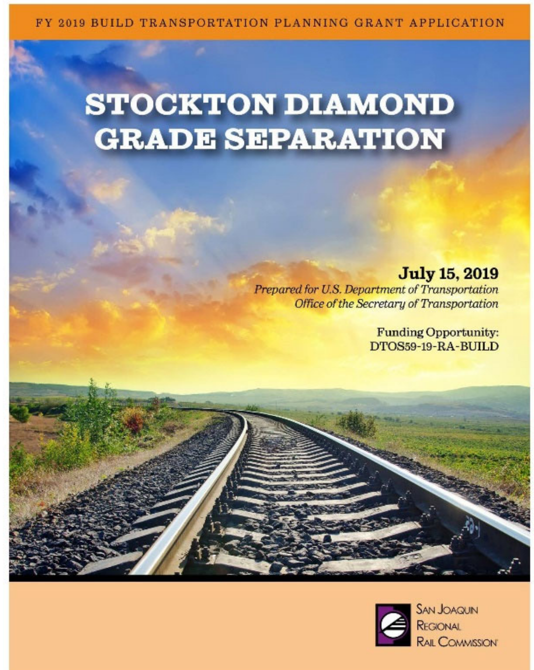
Based on the results of the project benefits scoring presented in Table 1, the following four (4) projects are recommended for short-term implementation with a total cost of $376.5 Million:

Table 2. Recommended Short-Term (2025) Solutions for Congested Corridors Improvement Projects

Improvement Project	Estimated Cost (Millions $)	Expected Regional Benefit
1. Stockton Diamond Grade Separation (Project #47)	$272.1 M	Improve passenger, commuter and freight rail mobility of heavily trafficked UPRR and BNSF mainlines
2. SR 99 / SR 120 Connector Phase 1B Project (Project #40)	$34.9 M	Significantly reduce passenger hours of delay (30%) and increase throughput (45%). Improve safety and air quality
3. I-205 Sub-Area Integrated Corridor Management Plan (System Management, Traveler Information and Commercial Vehicle Operations) (Project #14)	$48.0 M	Reduce congestion on I-205 and parallel City of Tracy, Mountain House, and San Joaquin County local roadways
4. SR 99 Sub-Area Integrated Corridor Management Plan (System Management, Traveler Information and Commercial Vehicle Operations) (Project #45)	$21.5 M	Reduce congestion on SR 99 between SR 120 and the Stanislaus River
Total Cost of Recommended Short-Term Solutions for Congested Corridors Improvement Projects	**$376.5 M**	**Or $0.3765 Billion**

Sources: 1. SR 120 / SR 99 PA / ED, SJCOG / Caltrans 2019
2. Caltrans District 10 Integrated Corridor Management Plan – 2019 (47% OF $91.5m)
3. Stockton Diamond Grade Separation Grant Application – 2019
4. Caltrans District 10 Integrated Corridor Management Plan – 2019 (21% OF $91.5m)

<u>Stockton Diamond Grade Separation Project</u>- The Stockton Diamond is currently the busiest at-grade crossing (UP Fresno Sub / BNSF Stockton Sub) of railway lines in the State of California. It is located at the crossroads of two heavily trafficked rail corridors of regional, national, and global commercial significance near downtown Stockton, California, and in a mega-region experiencing significant growth. The San Joaquin Rail Commission (SJRRC) is leading the effort to construct the Stockton Diamond Grade Separation Project.



The current at-grade crossing contributes to considerable delays to railway operations, including passenger trains and freight trains (including those serving the Port of Stockton). These delays are expected to hinder the projected growth capabilities of the Port of Stockton and impact ever-increasing demand for rail access and capacity by a variety of freight rail shippers and receivers.

The delays are also expected to limit the anticipated service and network expansions of regional and statewide passenger rail services, including the Altamont Corridor Express (ACE) and the Amtrak San Joaquins, which are generally viewed by public agencies and the public as critical to supporting the region's future capacity, mobility, and connectivity needs.

Given the significant delay impacts at the railway crossing, the Stockton Diamond Project considers a grade separation. By grade separating the at-grade railway crossing, the project will provide an uninterrupted flow of trains passing through the crossing, and in-turn this is expected to have ripple effects throughout the region. More locally, the grade separation will improve the reliability and safety of passenger and freight rail transportation and decrease fuel consumption for idling locomotives.

In addition, the project is looking to grade separate two local road crossings and close six additional at-grade local road crossings. The crossings that are proposed to be closed were selected due to a combination of low traffic volumes and the substantial improvements required to maintain access, while the at-grade crossings that are expected to be grade separated were selected due to their high traffic volume. The closure and grade separation of the crossings are expected to provide additional safety benefits through the elimination of any potential future vehicle/train accidents at the six identified crossings. However, these benefits are slightly offset by the additional impacts generated through diverted vehicle traffic and the small impacts from the marginal increase in travel distance.

SR 99 / SR 120 Connector Project Phase 1B – The primary objectives of the SR 120 / SR 99 Interchange Project are:

- Relieve congestion and improve regional mobility by increasing capacity at the SR 120 / SR 99 interchange;
- Improve local traffic circulation and reduce cut-through traffic by providing additional capacity at the State Route 120 and SR 99 interchange;

The need for the project is related to declining level of service on northbound State Route 99 and the potential for future safety issues at the single off-ramp to westbound State Route 120.

The Phase 1B Project would include the following project design elements:

- Widen the northbound SR 99 to westbound SR 120 connector ramp from one-lane to two-lanes;
- Add an auxiliary lane in the existing median of westbound SR 120 from Main Street to SR 99; and
- Convert the existing 99/120 separation structure to two lanes and construct a new separation structure to serve the eastbound 120 to northbound 99 connector ramp.

As traffic volumes continue from Stanislaus County continue to increase on northbound State Route 99, the SR 99 / SR 120 Connector Phase 1B Project would significantly reduce passenger hours of delay by 30% and increase throughput 45% when compared to Year 2040 No Project Conditions. The SR 99 / SR 120 Connector Phase 1B Project would improve safety and air quality.

I-205 Sub-Area Integrated Corridor Management Plan (System Management, Traveler Information and Commercial Vehicle Operations) and SR 99 Sub-Area Integrated Corridor Management Plan (System Management, Traveler Information and Commercial Vehicle Operations) – In the October 2019 Draft Report, the Integrated Corridor Management Plan would provide traffic management benefits under recurrent and non-recurrent conditions. Under recurrent conditions, ramp metering, traveler information, and traffic monitoring across jurisdictions enables traffic management staff and drivers to be better-informed of traffic conditions, which can enhance safety, improve travel time reliability, and provide an opportunity to enhance operational tactics. Under non-recurrent conditions, traveler information, route guidance, dynamic lane usage, and traffic signal timing modifications enable Caltrans and local agencies to deploy operational strategies based on actual conditions, and enables drivers to be better informed of preferred routes and actual conditions.

The following potential ICM strategies are included:

- Freeway Management
- Arterial Management
- Transit Management
- Traveler Information
- Incident Management
- Maintenance and Construction Management
- Commercial Vehicle Operations

ITS field elements and systems can be used to enhance operations to be truly integrated and coordinated. The development and deployment of operational strategies maximizes the effectiveness of ITS field devices by moving toward the next level of enhanced traffic operations and management. Operational strategies are traffic operating tools that can be activated across jurisdictions to proactively implement a real-time, dynamic response to optimize corridor performance during specific conditions. Operational strategies are predefined steps identified by stakeholders for specific operational scenarios.

RECOMMENDED MID-TERM (2030) PROJECTS

Based on the results of the project benefits scoring presented in Table 1, the following three (3) projects are recommended for mid-term implementation with a total cost of $2.1838 Billion:

Table 3. Recommended Mid-Term (2030)
Solutions for Congested Corridors Improvement Projects

Improvement Project	Estimated Cost (Millions $)	Expected Regional Benefit
1. I-205 High Occupancy Vehicle Lane (Carpool) and Express Lane from County Line to I-5 (Project #3)	$500.0 M	Significantly reduce passenger hours of delay (65%) and increase in passenger throughput (40%). Improve safety and air quality
2. Valley Link track construction and stations at Mountain House and Downtown Tracy (Project #9) 2A. Altamont Corridor Vision Phase 1 ($1.2 B)	$1,590.0 M	Increase person throughput and reduce reliance on automobile traffic. Reduce congestion on I-205 and parallel City of Tracy, Mountain House, and San Joaquin County local roadways
3. SR 120 High Occupancy Vehicle Lane (Carpool) and Express Lane from I-5 to SR 99 (Project #28 and #29)	$93.8 M	Significantly reduce passenger hours of delay (35%) and increase in passenger throughput (30%). Improve safety and air quality
Total Cost of Recommended Short-Term Solutions for Congested Corridors Improvement Projects	**$2,183.8 M**	**Or $2.1838 Billion**

Sources: 1. Caltrans District 10 PSR-PDS - Approved December 2017 with approximation for additional Express Lane Elements
2. Valley Link Feasibility Study (October 2019) Based on 50% of (2.417B+3.211B)/2 = 2.814B/2 = 1.407B
3. Caltrans District 10 PSR-PDS – Approved October 2018 with approximation for additional Express Lane Element

I-205 High Occupancy Vehicle Lane (Carpool) and Express Lane from County Line to I-5 – The construction of the HOV/Transit/Express Lane on westbound I-205 will reduce passenger hours of delay by up to 65% from Interstate 5 to the I-205 / I-580 freeway to freeway interchange during the morning peak period. In addition, the mode split would increase as carpool and transit passengers would have a dedicated travel lane for approximately 14 miles. This would result in a 40% increase in passenger throughput during the morning peak period from Interstate 5 to the I-205 / I-580 interchange during the morning peak period.

On the other hand, regardless of whether one or two westbound lane(s) are constructed, the westbound I-205 HOV/Transit/Express Lanes will result in increased congestion and delays at the terminus of the project in Alameda County.

The Year 2040 Travel Demand Forecasting showed that as a result of the number of jobs in the San Francisco Bay Area, the directional split during the morning peak period (5 AM to 10 AM) is 70% westbound and 30% eastbound. During the evening peak period (2PM to 7 PM), the directional split is 40% westbound and 60% eastbound. Therefore, the I-205 corridor is an excellent candidate for reversible travel lanes. Additional analysis would be completed as part of the I-205 Widening Project Environmental Document.

In the eastbound I-205 direction, the existing bottleneck on the Altamont Pass will continue to meter the amount of traffic leaving Alameda County and entering San Joaquin County. The construction of the HOV/Transit/Express Lane on eastbound I-205 will reduce passenger hours of delay by 25% from the County Line to Interstate 5 during the evening peak period. In addition, the eastbound HOV/Transit/Express Lane would eliminate the congested sections of eastbound I-205 between the Grant Line Road interchange and the MacArthur interchange by providing carpool /transit vehicles improved travel times in a dedicated lane.

Valley Link Construction and Stations - In the Valley Link Project Feasibility Report (October 2019) the Valley Link Project is a major component of the Altamont Corridor Vision Phase 1. The Altamont Corridor Vision was conceived as a rail-based transit solution to bridge the gap between BART and ACE and improve connections between the greater San Francisco Bay Area and San Joaquin County. In November, 2020 the FASTER Bay Area ballot measure will determine the funding for the following major project components:

- Improved Air Quality and reduced Green House Gas Emissions
- Reduced reliance on automobiles
- Expanded connectivity to local transit and feeder service
- Seamless transfers to BART and ACE
- Key element of the California State Rail Plan vision
- Integrated fare systems

According to the Valley Link Project Feasibility Report, a total of seven (7) stations would be constructed with the following four (4) in San Joaquin County:

- Mountain House;
- Downtown Tracy;
- River Islands; and
- North Lathrop.

The Valley Link Project would serve 26,000 to 28,000 daily riders by 2040. This would be equal to taking up to 14,000 vehicles in each direction on the Altamont Pass and a yearly reduction of 33,000 metric tons of CO2 emissions in 2040. Headways are projected to be every 24 minutes in San Joaquin County during the AM and PM peak period and 60-minute headway during off-peak. Initial service operations would be from 5AM to 8 PM connection the Greenville station to the five (5) stations in San Joaquin County.

In 2018 dollars, the full Valley Link project between Dublin/Pleasanton BART and North Lathrop including alignment, stations, an operations and maintenance facility, and vehicles is estimated to cost between $1.8 and $2.5 billion (FY18) and between $2.4 and $3.2 billion ($YOE). Based on similar services, operating and maintaining this system would cost between $29.4 and $35.2 million annually (FY28).

The Funding Plan identifies capital funding sources and operating revenue sources, and rates them according to how likely they will become available for the project. Capital funds reallocated from the BART-to-Livermore project and Tri-Valley Transit Access Improvements and from City of Livermore impact fees have the highest likelihood, and total $628 million. Along with the farebox revenue and parking revenue generated by the project, estimated to cover up to half of required operating funds, high-likelihood operating revenue sources include Congestion Mitigation and Air Quality Improvement (CMAQ) funds and FTA Section 5307 and 5337 formula funds designated to San Joaquin County.

Based on capital funding assumptions, there is a funding gap for Valley Link Phase I and the early phase to Downtown Tracy. Financing could be considered if no additional capital funds are secured. The Funding Plan identifies several revenue streams that can be used for debt service payments. A hypothetical Transportation Infrastructure Finance and Innovation Act (TIFIA) Loan would require an annual debt service between $6.7 million and $17.8 million.

SR 120 High Occupancy Vehicle Lane (Carpool) and Express Lane from I-5 to SR 99 - The completion of the SR 120 / SR 99 Phase 1A (funded) and Phase 1B (Recommended Short-Term Project) will necessitate the need to construct the SR 120 HOV/Transit, Express Lane between Interstate 5 and State Route 99.

The construction of the HOV/Transit/Express Lane on westbound SR 120 will reduce passenger hours of delay by up to 35% from State Route 99 and Interstate 5 during the morning peak period. In addition, the mode split would increase as carpool and transit passengers would have a dedicated travel lane for approximately six (6) miles. This would result in a 30% increase in passenger throughput during the morning peak period from State Route 99 to Interstate 5 during the morning peak period

The Year 2040 Travel Demand Forecasting showed that due to the number of jobs in the San Francisco Bay Area, the directional split during the morning peak period (5 AM to 10 AM) is 75% westbound and 25% eastbound. During the evening peak period (2PM to 7 PM), the directional split is 35% westbound and 65% eastbound. Therefore, the SR 120 corridor is also a candidate for reversible travel lanes.

RECOMMENDED LONG-TERM (2035) PROJECTS

Based on the results of the project benefits scoring presented in Table 1, the following four (4) projects are recommended for long-term implementation with a total cost of $2.6745 Billion:

Table 4. Recommended Long-Term (2035) Solutions for Congested Corridors Improvement Projects

Improvement Project	Estimated Cost (Millions $)	Expected Regional Benefit
1. I-580 High Occupancy Vehicle Lane (Carpool) and Express Lane from I-580 / Greenville Road to County Line (Project #1 and #2)	$668.0 M	Significantly reduce passenger hours of delay (50%) and increase throughput (45%). Improve safety and air quality
2. Fixed Guideway Concept on I-580 / I-205 from Grant Line Road to Paradise Cut (Project #8)	$1,135 M	Increase person throughput and reduce reliance on automobile traffic. Reduce congestion on I-205 and parallel City of Tracy, Mountain House, and San Joaquin County local roadways
3. I-5 Mossdale Widening with High Occupancy Vehicle Lane (Carpool) and Express Lane (Project #15)	$308.0 M	Reduce congestion on I-5 between I-205 and SR 120 with direct HOV ramps
4. SR 99 Widening with High Occupancy Vehicle Lane (Carpool) and Express Lane (Project #42)	$563.5 M	Reduce congestion on SR 99 between SR 120 and the Hammatt Road interchange
Total Cost of Recommended Short-Term Solutions for Congested Corridors Improvement Projects	**$2,674.5 M**	**Or $2.6745 Billion**

Sources: 1. Approximation based on projects of similar size and scope
2. Approximation based on projects of similar size and scope
3. Caltrans District 10 PSR-PDS – Approved January 2019
4. Caltrans District 10 PSR-PDS – Approved June 2019

<u>I-580 High Occupancy Vehicle Lane (Carpool) and Express Lane from I-580 / Greenville Road to County Line</u> – The construction of the HOV/Transit/Express Lane on westbound I-205 from the County Line to I-5 will necessitate the need for extending the travel lane over the Altamont Pass, into Alameda County to connect with the existing HOV/Transit/Express Lane. With this long-term extension, a continuous HOV/Transit/Express Lane would connect San Joaquin County at Interstate 5 to the entire HOV/Transit/Express Lane system in the San Francisco Bay Area. Passenger hours of delay would be reduced by up to 50% from the Alameda / San Joaquin County Line to the I-580 / Greenville Road interchange during both morning and evening peak periods. In addition, the mode split would increase as carpool and transit passengers would have a dedicated travel lane for approximately 22 miles. This would result in a 45% increase in passenger throughput during both the morning and evening peak periods.

The I-580 corridor is also an excellent candidate for reversible travel lanes. Additional analysis would be completed as part of the I-580 High Occupancy Vehicle Lane (Carpool) and Express Lane Project Environmental Document. The benefits of a reversible travel lane were included in MTC's Interregional Project Funding and Coordination Policy, adopted in December 2019 (MTC Resolution No. 4399)

Fixed Guideway Concept on I-205 / I-580 from Grant Line Road to Paradise Cut – The Fixed Guideway Concept would be constructed in the center median of I-205 / I-580 from the Grant Line Road interchange to just east of the new I-205 / Chrisman Road interchange. The preliminary freeway cross-section (figure 9) shows that a dedicated bus lane, autonomous vehicle lane, reversible lane, or passenger rail system can be constructed in addition to a multi-modal HOV/Transit/Express Lane. These options could be phased dependent on available funding. This Fixed Guideway if implemented as a passenger rail system could provide a viable alignment option to the proposed Valley Link and existing ACE alignments, with stations located at Mountain House and Tracy. The fixed guideway would tie in with the remaining segments / phases of the Valley Link Project west of Grant Line Road and east of the Paradise Cut,

I-5 Mossdale Widening with High Occupancy Vehicle Lane (Carpool) and Express Lane - The completion of the SR 120 HOV/Transit/Express Lane between Interstate 5 and State Route 99 will necessitate the need to construct the I-5 Mossdale Widening with HOV/Transit/Express Lane between I-205 and SR 120. With this long-term extension project, a continuous HOV/Transit/Express Lane would connect San Joaquin County at Interstate 99 to the entire HOV/Transit/Express Lane system in the San Francisco Bay Area. Passenger hours of delay would be reduced by up to 57% from the SR 99 / SR 120 freeway to freeway interchange to the I-580 / Greenville Road interchange during both morning and evening peak periods. In addition, the mode split would increase as carpool and transit passengers would have a dedicated travel lane for approximately 30 miles. This would result in a 47% increase in passenger throughput during both the morning and evening peak periods.

SR 99 Widening with High Occupancy Vehicle Lane (Carpool) and Express Lane - The completion of the I-5 Mossdale Widening with HOV/Transit/Express Lane between I-205 and SR 120 and a dedicated travel lane for approximately 30 miles from the I-580 / Greenville Road interchange to the SR 99 / SR 120 freeway to freeway interchange, will necessitate the need to construct the SR 99 Widening with HOV/Transit/Express Lane Project between SR 120 and the Hammatt Road interchange. With this long-term extension project, a continuous HOV/Transit/Express Lane would connect Stanislaus County and San Joaquin County to the entire Bay Area HOV/Transit/Express Lane system in the San Francisco Bay Area. Passenger hours of delay would be reduced by up to 65% from the SR 99 / Hammatt Road interchange to the I-580 / Greenville Road interchange during both morning and evening peak periods. In addition, the mode split would increase as carpool and transit passengers would have a dedicated travel lane for approximately 37 miles. This would result in a 48% increase in passenger throughput during both the morning and evening peak periods.

CHAPTER 5. CONCLUSIONS

Based on the results of the I-205, I-5, SR 120 and SR 99 Congested Corridor Plan analysis, the following next steps should be completed:

1. Continue to work with Alameda County Transportation Commission, Tri-Valley San Joaquin Valley Regional Rail Authority, San Joaquin Regional Rail Commission, and Caltrans District 4 to fund and construct the multi-modal improvements on the I-205 / I-580 Corridor;

2. Begin the Environmental Document for the I-205 High Occupancy Vehicle Lane (Carpool) and Express Lane from the County Line to I-5 in 2020;

3. Through a technical memorandum, examine an array of transportation improvement options that address the impact of SR 99 and SR 120 cut through traffic in the City of Ripon and San Joaquin County crossing the Stanislaus River. The Technical Report would identify short-term engineering, operational, and enforcement strategies. It will also identify long term corridor improvements for a regional expressway circulation system including but not limited to River Road, Raymus Parkway, and Olive Expressway. When complete, the technical report will be an administrative addendum to the Congested Corridor Plan.

4. Update the SJCOG RTP / SCS in 2020 to prioritize the following projects:

    a. Mid-Term (2030) Projects;
        i. I-205 High Occupancy Vehicle Lane (Carpool) and Express Lane from County Line to I-5 (SJCOG and Caltrans);
        ii. Altamont Corridor Vision Phase 1 Project or Valley Link Construction and Stations (Tri-Valley San Joaquin Regional Rail Authority); and
        iii. SR 120 High Occupancy Vehicle Lane (Carpool) and Express Lane from I-5 to SR 99 (SJCOG)

    b. Long Term (2035) Projects.
        i. I-205 High Occupancy Vehicle Lane (Carpool) and Express Lane from I-580 / Greenville Road to County Line (ACTC and Caltrans);
        ii. Fixed Guideway Concept on I-205 / I-580 from Grant Line Road to Paradise Cut (Tri-Valley San Joaquin Regional Rail Authority);
        iii. I-5 Mossdale Widening with High Occupancy Vehicle Lane (Carpool) and Express Lane (SJCOG and Caltrans); and
        iv. SR 99 Widening with High Occupancy Vehicle Lane (Carpool) and Express Lane (SJCOG and Caltrans)

5. Pursue funding for the following Short-term (2025) Projects from available sources:
    a. Stockton Diamond Grade Separation (ACE);
    b. SR 99 / SR 120 Connector Phase 1B Project (SJCOG and Caltrans);
    c. I-205 Sub-Area Integrated Corridor Management Plan (System Management, Traveler Information and Commercial Vehicle Operations) (SJCOG and Caltrans); and
    d. SR 99 Sub-Area Integrated Corridor Management Plan (System Management, Traveler Information and Commercial Vehicle Operations) (SJCOG and Caltrans)

6. Begin the Environmental Document for the SR 120 High Occupancy Vehicle Lane (Carpool and Transit) and Express Lane from I-5 to SR 99 in 2022 (SJCOG and Caltrans).

7. Coordination with MTC and inclusion in MTC's RTP/SCS for projects crossing into the San Francisco Bay Area.

APPENDIX A:

THREE COUNTY MODEL ANALYSIS OF MULTI-MODAL PROJECTS

Appendix A - Technical Memorandum

Date: November 7, 2019

To: David Ripperda, Associate Regional Planner
Kim Kloeb, Senior Regional Planner
SJCOG

From: Fehr & Peers, Sacramento CA Office– Travel Demand Forecasting Discipline Group

Subject: Three County Model Updates and Analysis for the SJCOG I-205, I-5, SR 120 and SR 99 Congested Corridor Plan

RS18-3700

Purpose

This purpose of this memorandum is to document the improvements made to the Three County Model received in August 2019 for use for the SJCOG I-205, I-5, SR 120 and SR 99Congested Corridor Plan.

Network Modifications

The base year network in the model in some cases did not reflect the existing network. Some of the discrepancies were along SR 99. The following changes were made in the base year network to make sure that they reflect base year condition are listed below:

- Updated no of lanes and configuration of the SR 120/SR 99 interchange to match existing (2018) conditions.
- Updated no of lanes and configuration of the I-5/I-205 interchange to match existing (2018) conditions.
- Updated no of lanes (mainline three lanes) of SR 99 between South of Lodi and Ripon (approximately) to match existing conditions.

There may be other areas in the model network that does not match the existing condition. It is important to update them. Otherwise the model validation will not be accurate.

One of the major improvements to the Three County Model was at the San Joaquin County / Alameda County line. The model gateways to and from I-205, I-580 and Grant Line Road were combined to include the I-580 / Grant Line Road interchange and the Altamont Pass as shown in Figure 1 below.

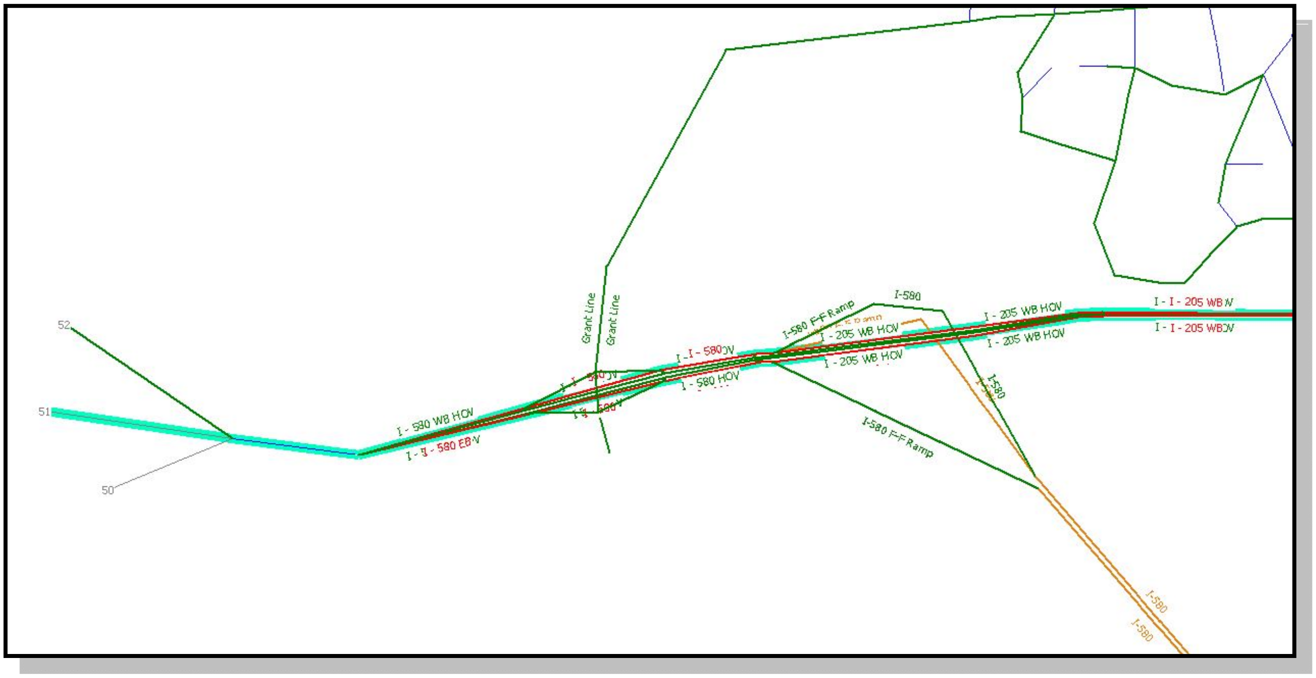


Figure 1: Improved Three County Model Gateway – San Joaquin County / Alameda County

Three County Model Script Modifications

Some of the model scripts were modified as they were generating incorrect model outputs. Some of the initial issues identified with the model output are listed below-

1. The ratio between AM peak period (AM3) and AM peak hour (AM1) was too high in the loaded network. On a model-wide basis, the average ratio between A3 and A1 was 7.09 (Link Volume for AM1>1). Whereas, the same between PM peak period (PM3) and PM peak hour (PM1) was 2.24 (Link Volume for PM1>1). Similarly, the average congested speed in AM1 is higher than AM3 which is counterintuitive.

Table 1 shows the model-wide AM and PM Peak Period to Peak Hour ratios and congested speeds.

Table 1: Model-wide Link Attributes

Attribute	Maximum	Sum	Average	Average (<>0)
TOT_A01_VOL	6,540	11,946,900	246	262
TOT_A03_VOL	38,717	47,652,500	984	1,038
TOT_P01_VOL	13,478	19,860,500	410	432
TOT_P03_VOL	31,549	46,630,900	963	1,022
AM_RATIO	1,162	282,095	5.83	7.09
PM_RATIO	99	93,680	1.94	2.24
A01_ASG_SP	68.69	1,470,760	30.39	30.45
A03_ASG_SP	67.57	1,436,090	29.67	29.73
P01_ASG_SP	67.13	1,427,530	29.50	29.55
P03_ASG_SP	68.85	1,460,150	30.17	30.23

Source: Fehr & Peers, 2019.

2. Similar results are also seen in the trip tables. For AM peak hour, the volume distribution between different travel modes did not produce intuitive results. For example, the drive alone and shared ride (2 person) volumes for AM1 were much lower compared to other time periods.

Table 2: Trip Table Summary

Mode	AM1	AM3	PM1	PM3
Drive Alone	18,653	339,933	162,749	382,421
Shared Ride 2	2,471	77,839	36,929	89.816
Shared Ride 3	32,147	51,008	22,842	62.154
External-External	5,660	9,982	4,475	10.967
Truck	22,746	41,774	19,731	38,576

Source: Fehr & Peers, 2019

Figure 2 shows the volumes on the network for the four time periods discussed. It is clear that AM3 volumes are much higher compared to AM1.

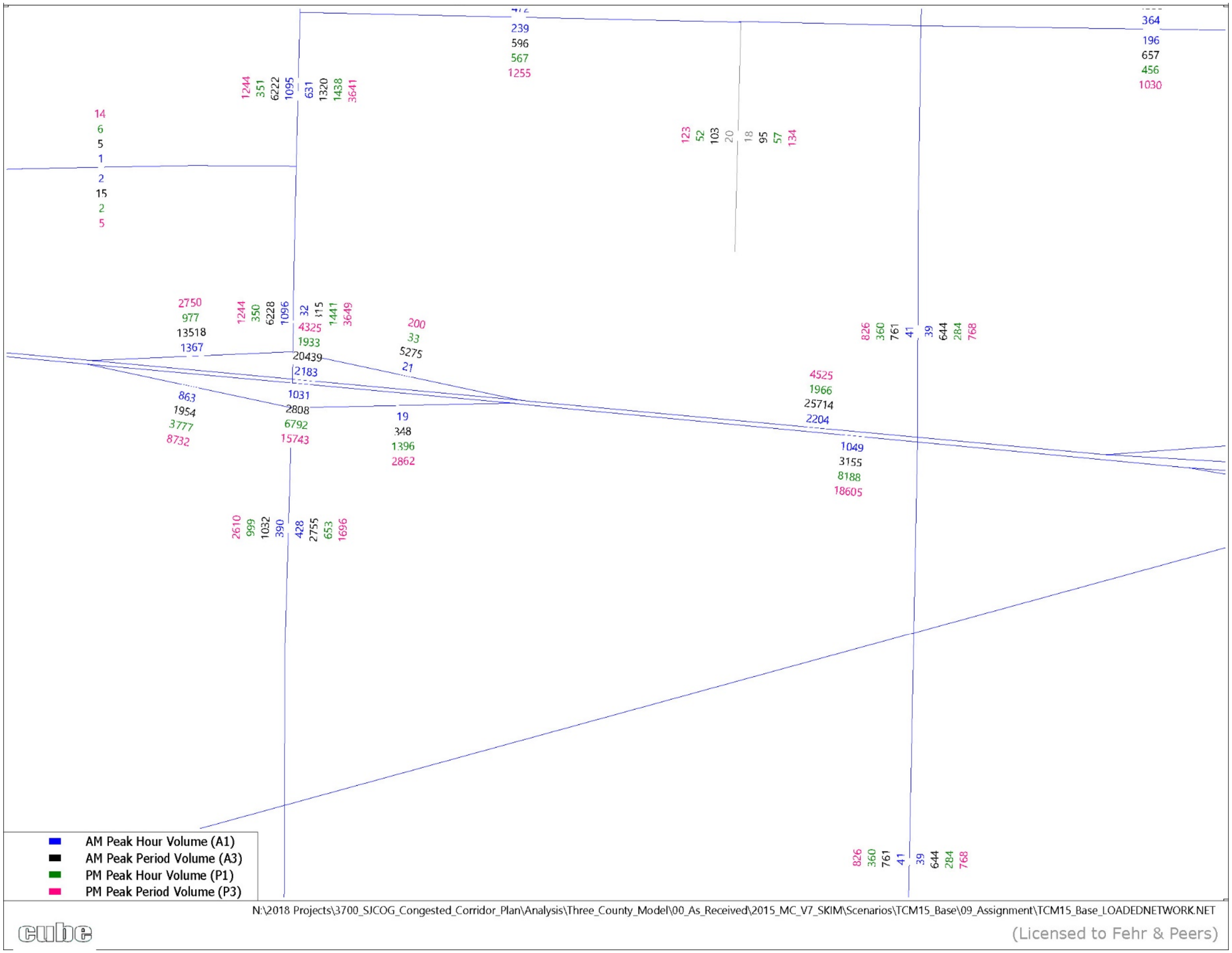


Figure 2: Peak Hour and Peak Period Volume Inconsistencies at the I-205 / Mountain House Parkway Interchange

These two issues were caused by a scripting error in the model. Within the Period Loop of Assignment step, the model was re-writing the matrix output for the Drive Alone and Shared Ride 2 trips tables by the Shared Ride-3, XX and Truck trip table. Also in the next step (Combine AM1), the script was referencing the same files twice. Figure 3 highlights the output tables in the script.

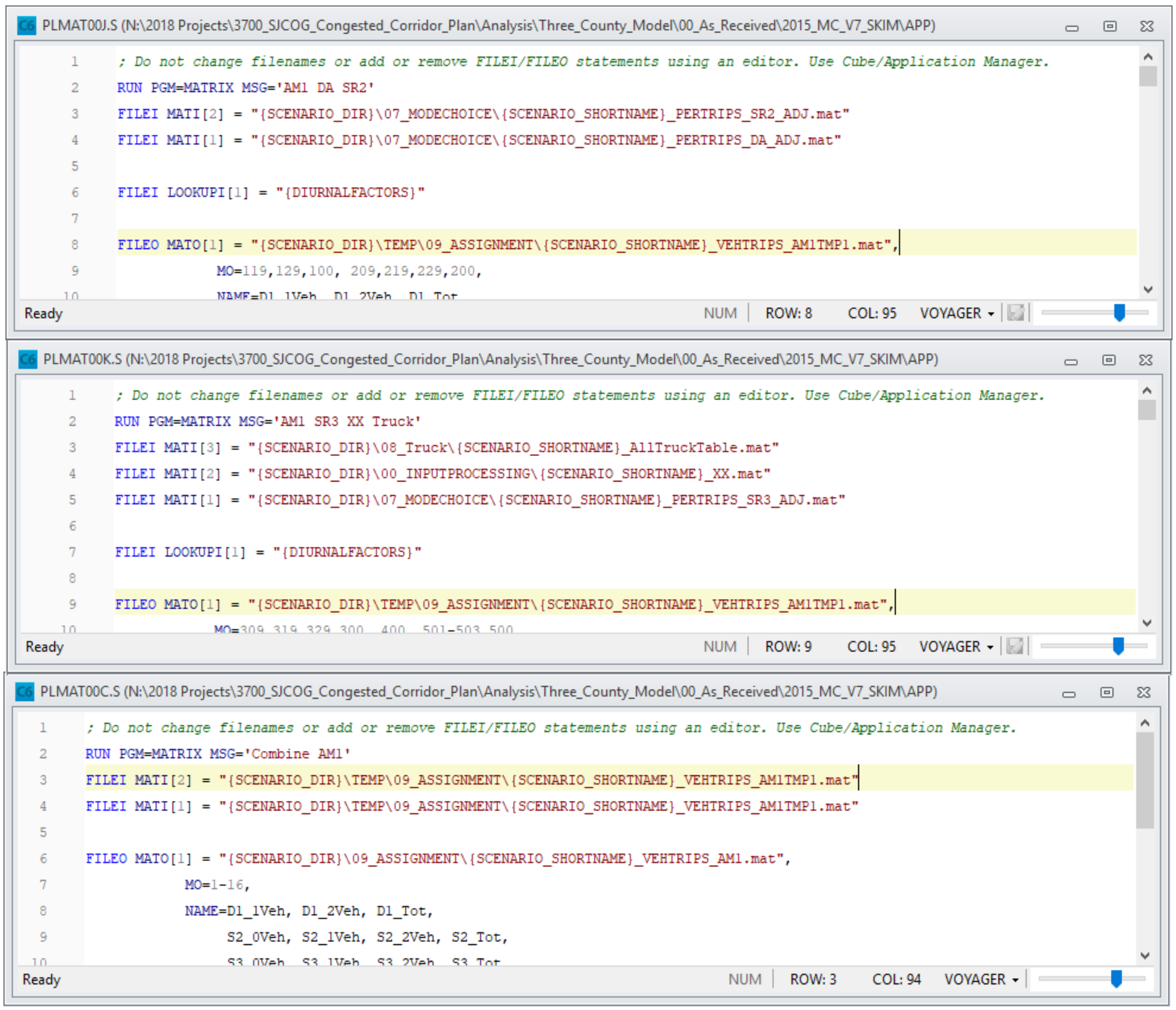


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Figure 3: Script Error (Highlighted Lines)

The scripts were modified as shown in figure 4. This solved the issues with AM1 volumes.

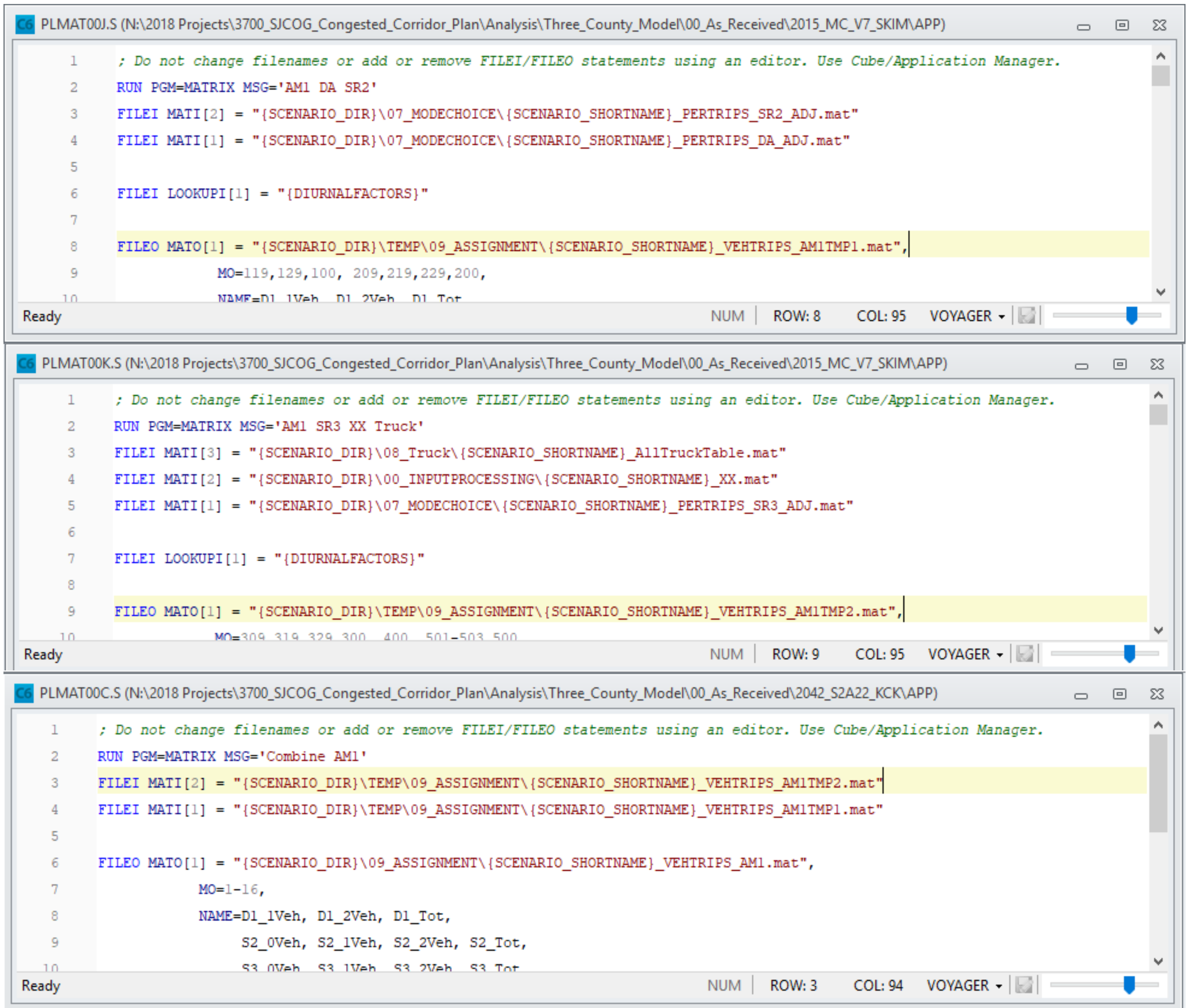


Figure 4: Script Edits (Highlighted Lines)

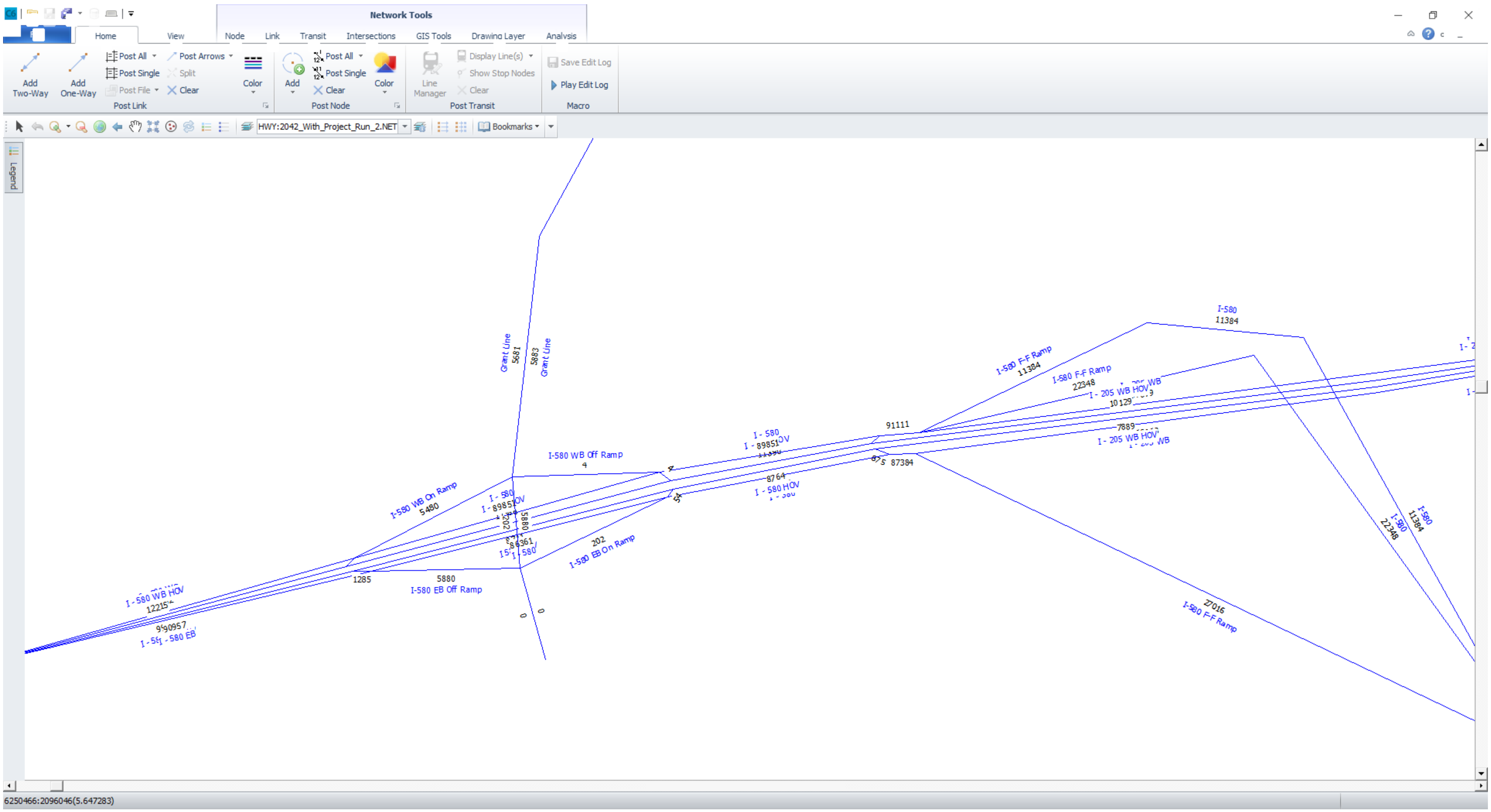
In this version of the model that was use for the Congested Corridor Plan, the ratio of AM3 and AM1 is more realistic and intuitive. Table 3 shows the updated volume ratios and congested speeds.

Table 3: Model-wide Link Attributes- Updated Version

	Off-the-shelf Version				Updated Version			
Attribute	Maximum	Sum	Average	Average (>0)	Maximum	Sum	Average	Average (>0)
TOT_A01_VOL	6,540	11,946,900	246	262	22,475	28,090,700	581	606
TOT_A03_VOL	38,717	47,652,500	984	1,038	38,251	46,698,700	966	1,020
AM_RATIO	1,162	282,095	5.83	7.09	263	69,657	1.44	1.64
A01_ASG_SP	68.69	1,470,760	30.39	30.45	65.56	1,347,760	27.89	27.93
A03_ASG_SP	67.57	1,436,090	29.67	29.73	68.67	1,437,720	29.75	29.80

Source: Fehr & Peers, 2019.

The following pages are the Final SJCOG Congested Corridor Plan Three County Model starting from the I-580 / Grant Line Road interchange in Alameda County to the SR 99 / Kiernan interchange in Stanislaus County.



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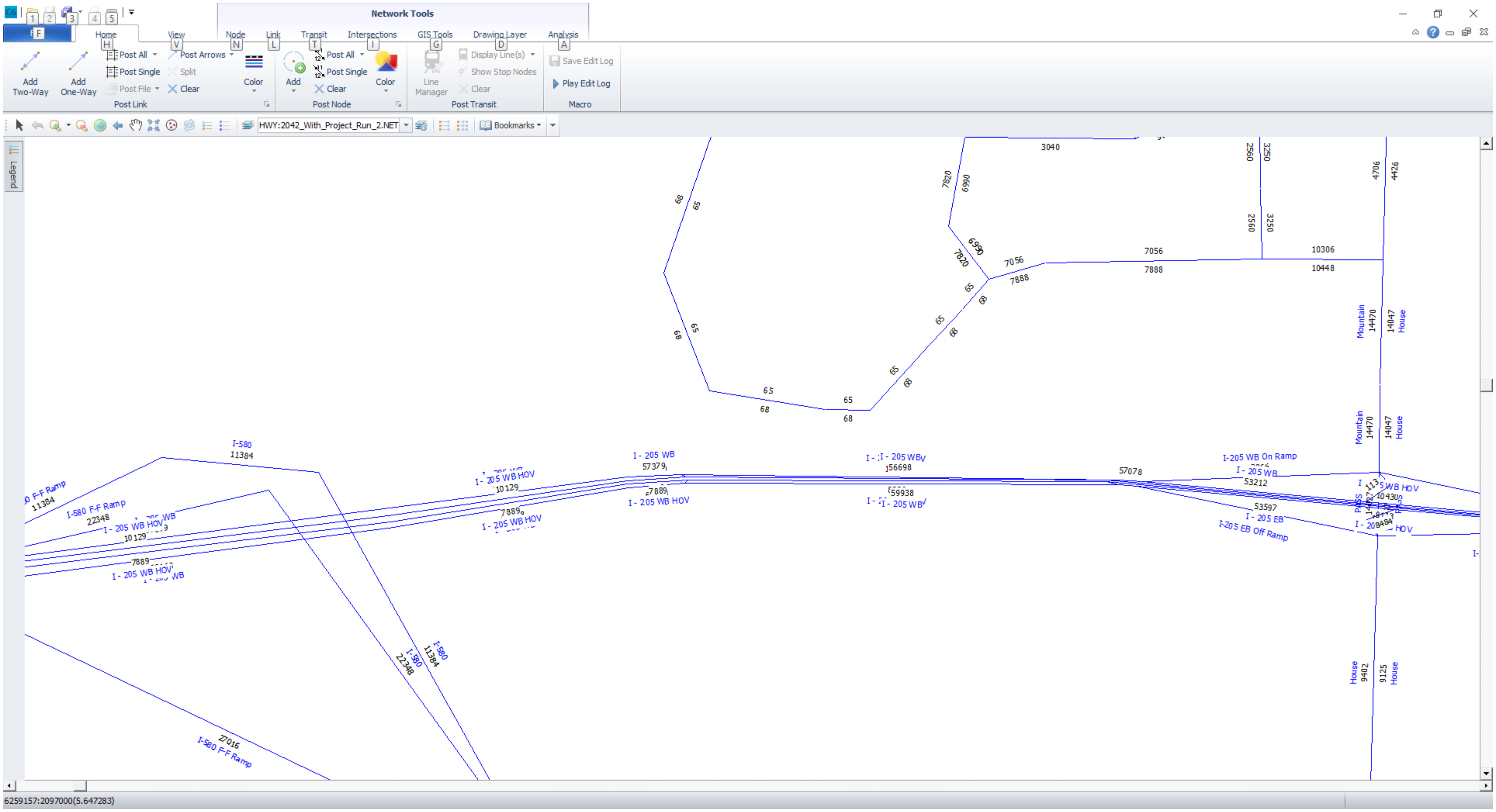
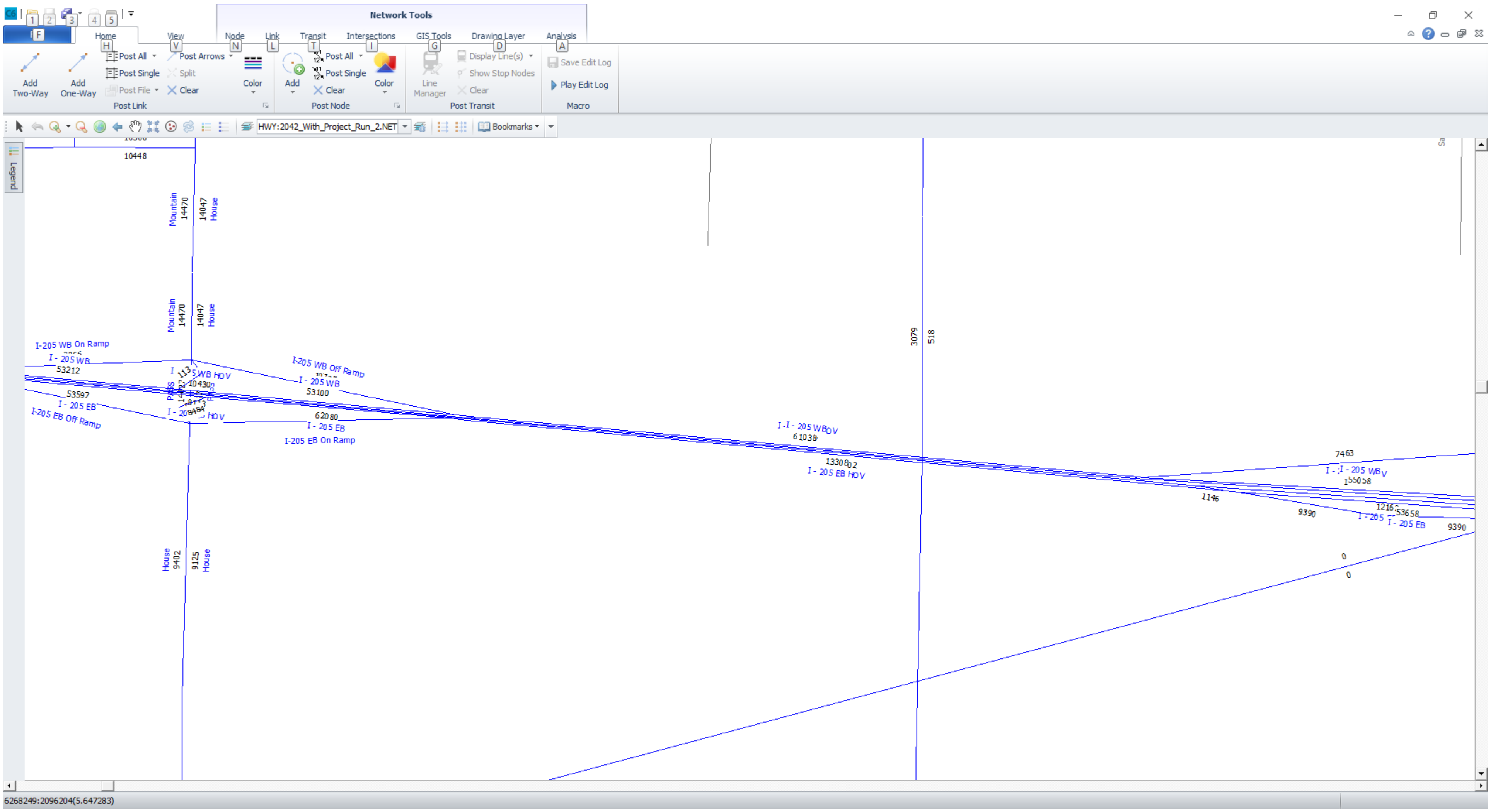
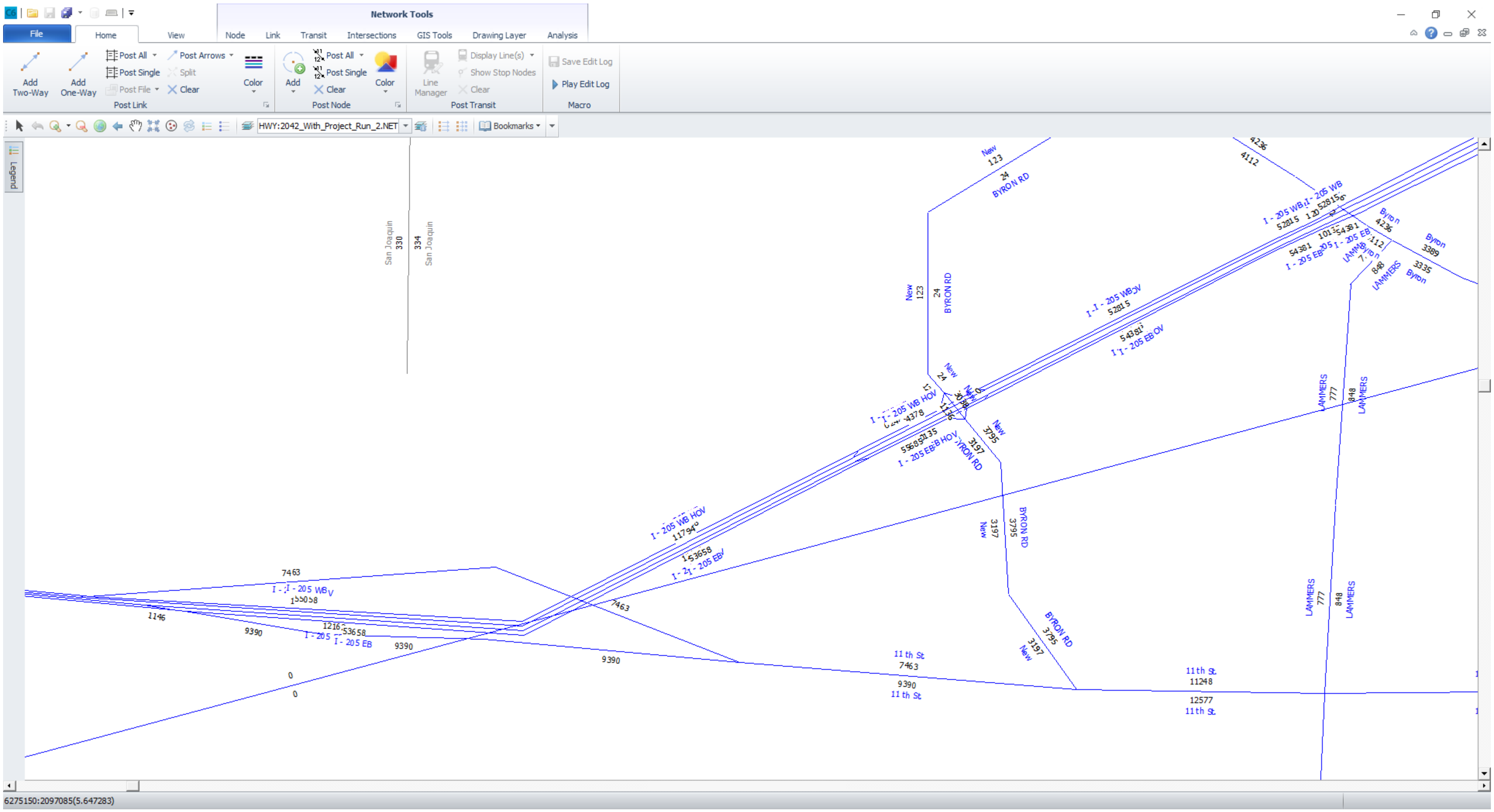


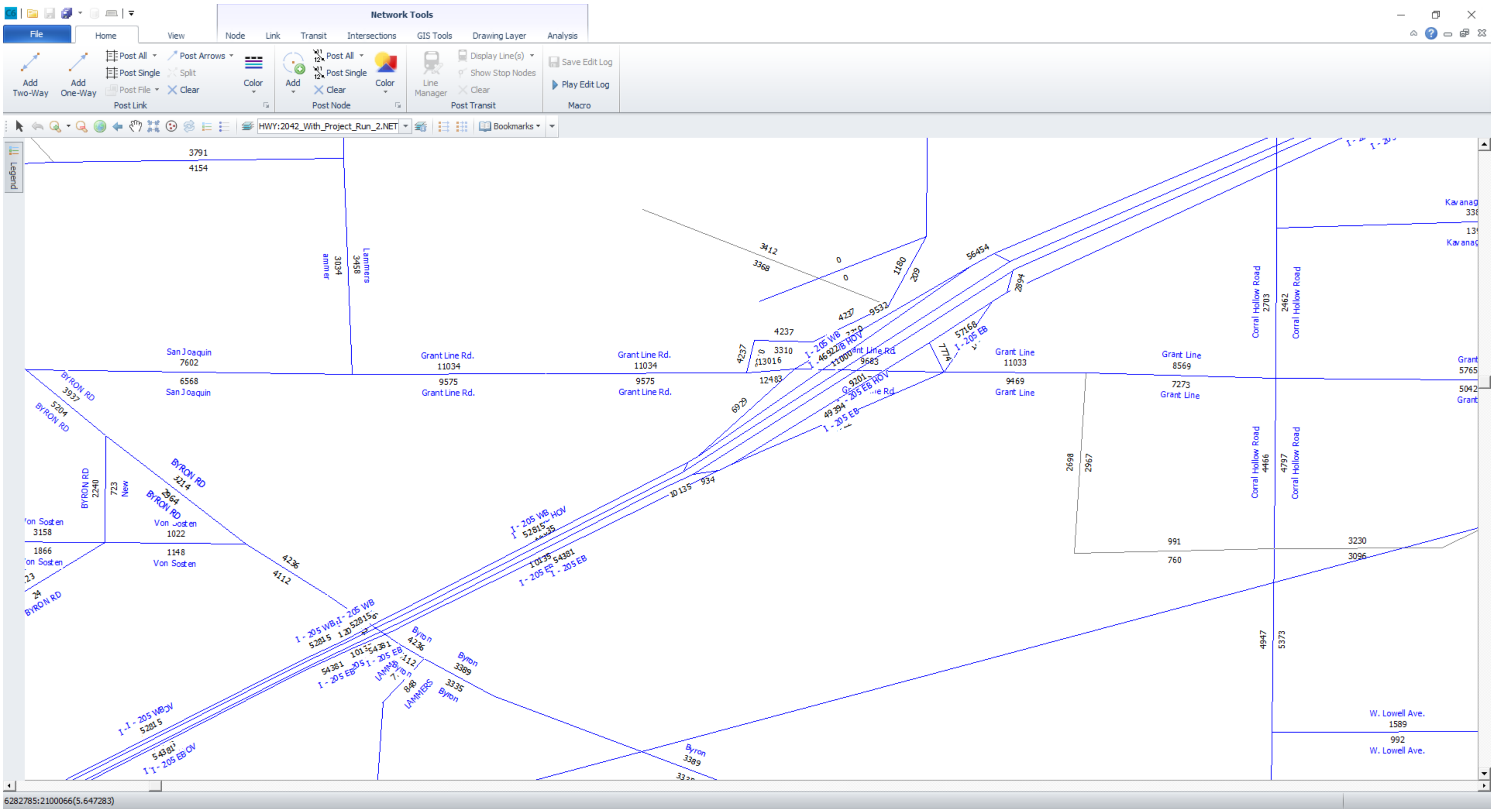
I-580 / I-205 interchange to I-205 / Mountain House Interchange– 2040 With Project Average Daily Traffic Volumes



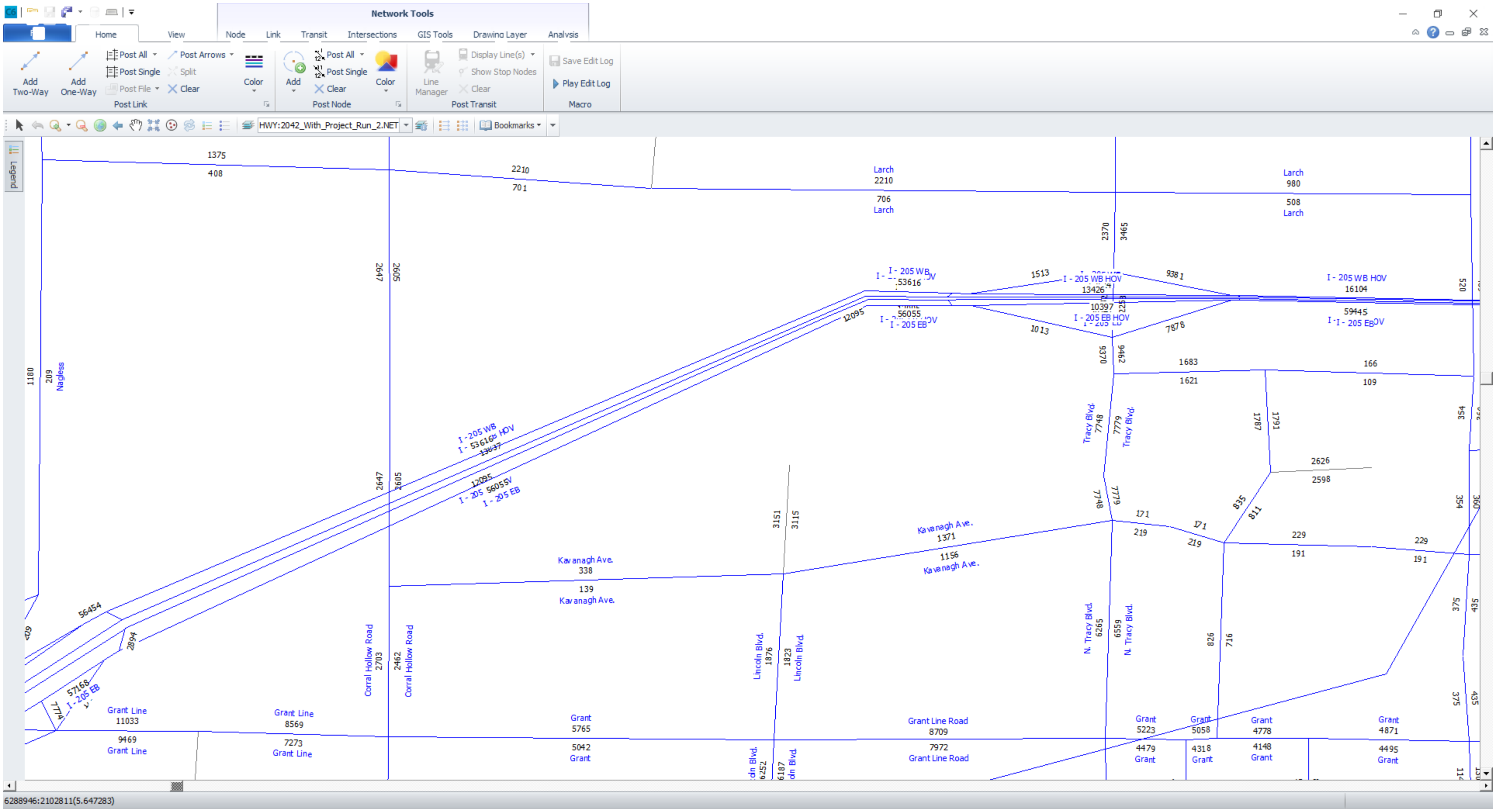
I-205 / Mountain House Interchange to I-205 / 11th Street interchange– 2040 With Project Average Daily Traffic Volumes



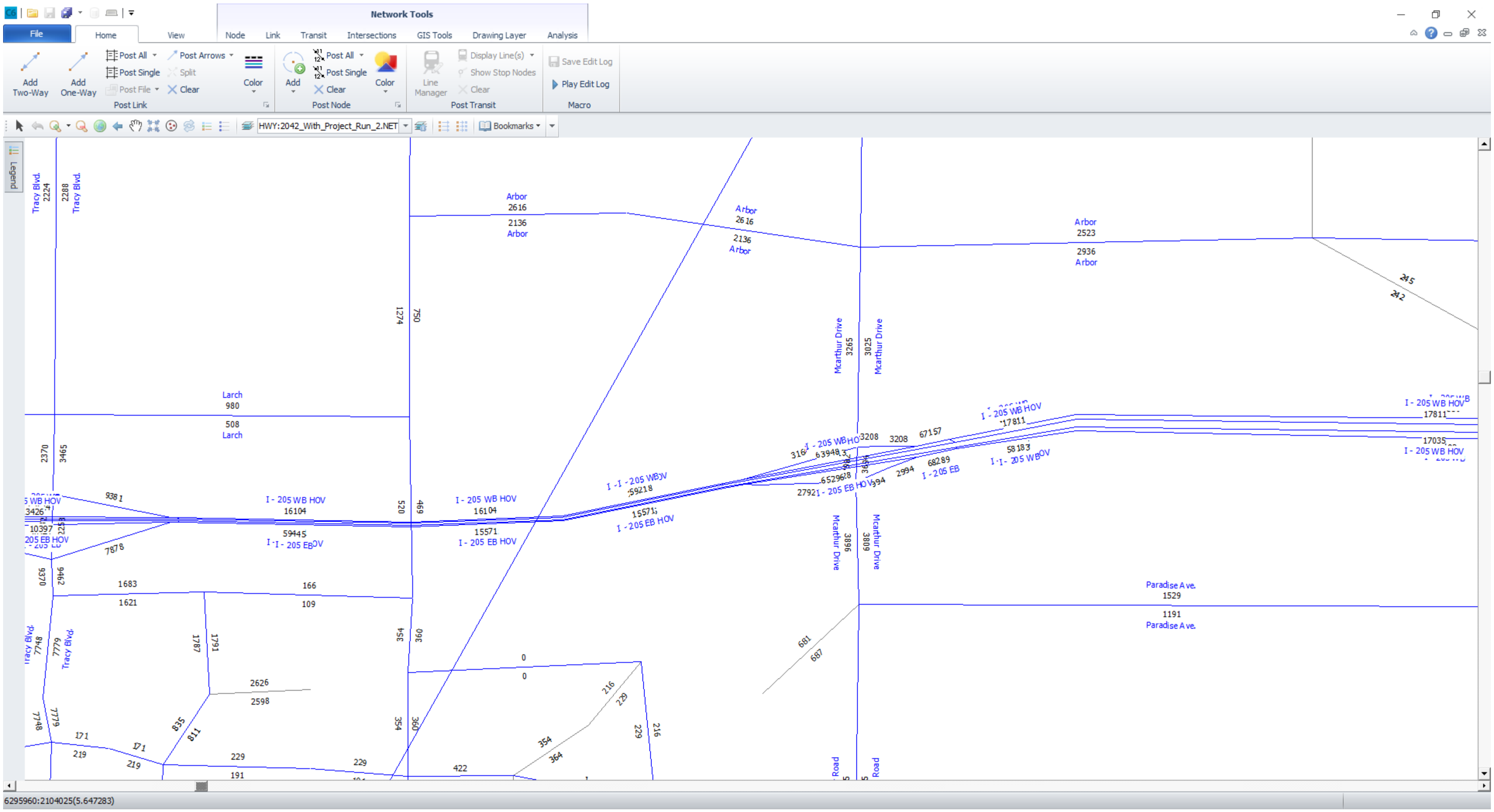
I-205 / Mountain House Interchange to I-205 / 11th Street interchange– 2040 With Project Average Daily Traffic Volumes



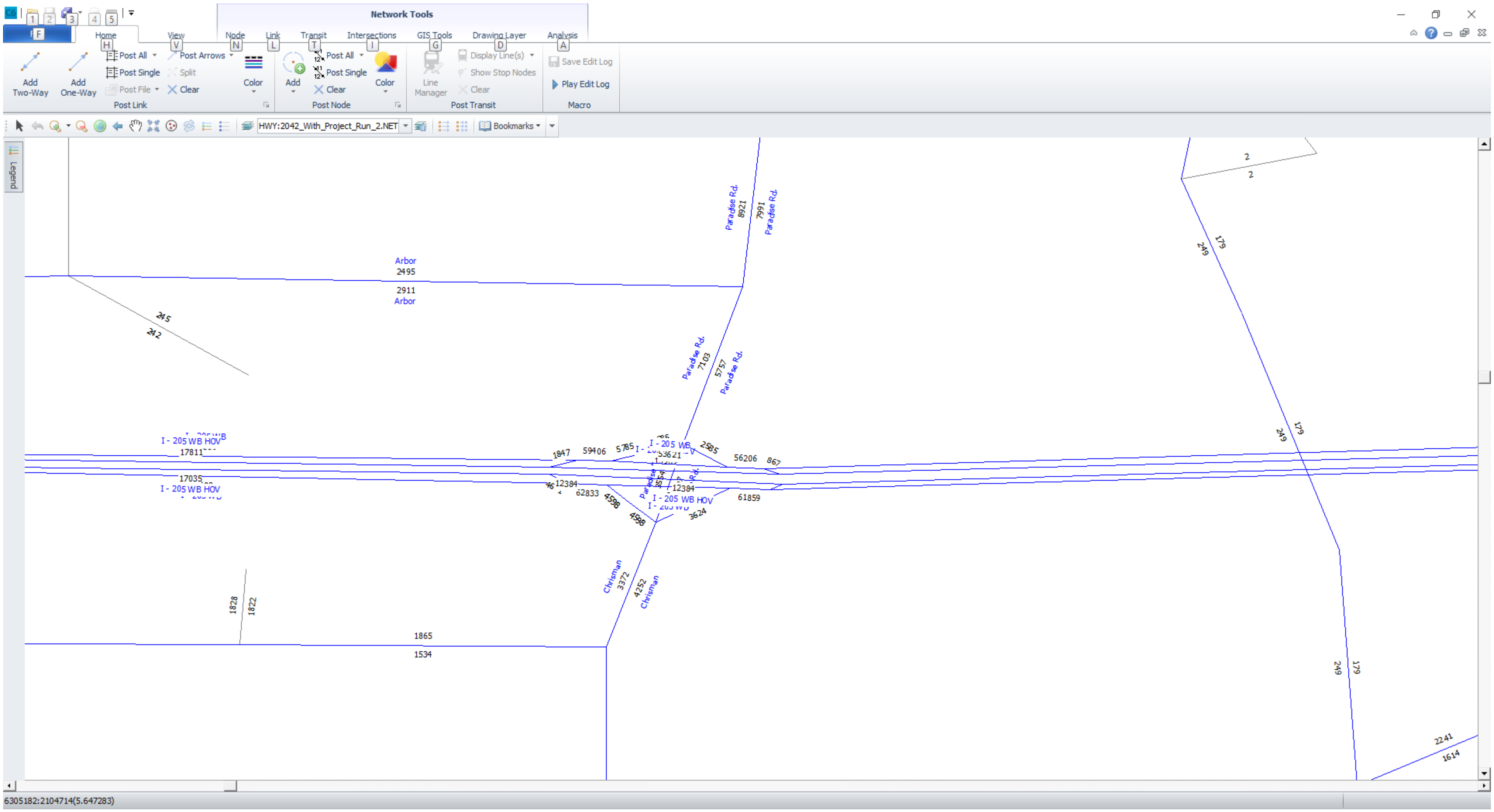
I-205 / Grant Line Road interchange– 2040 With Project Average Daily Traffic Volume



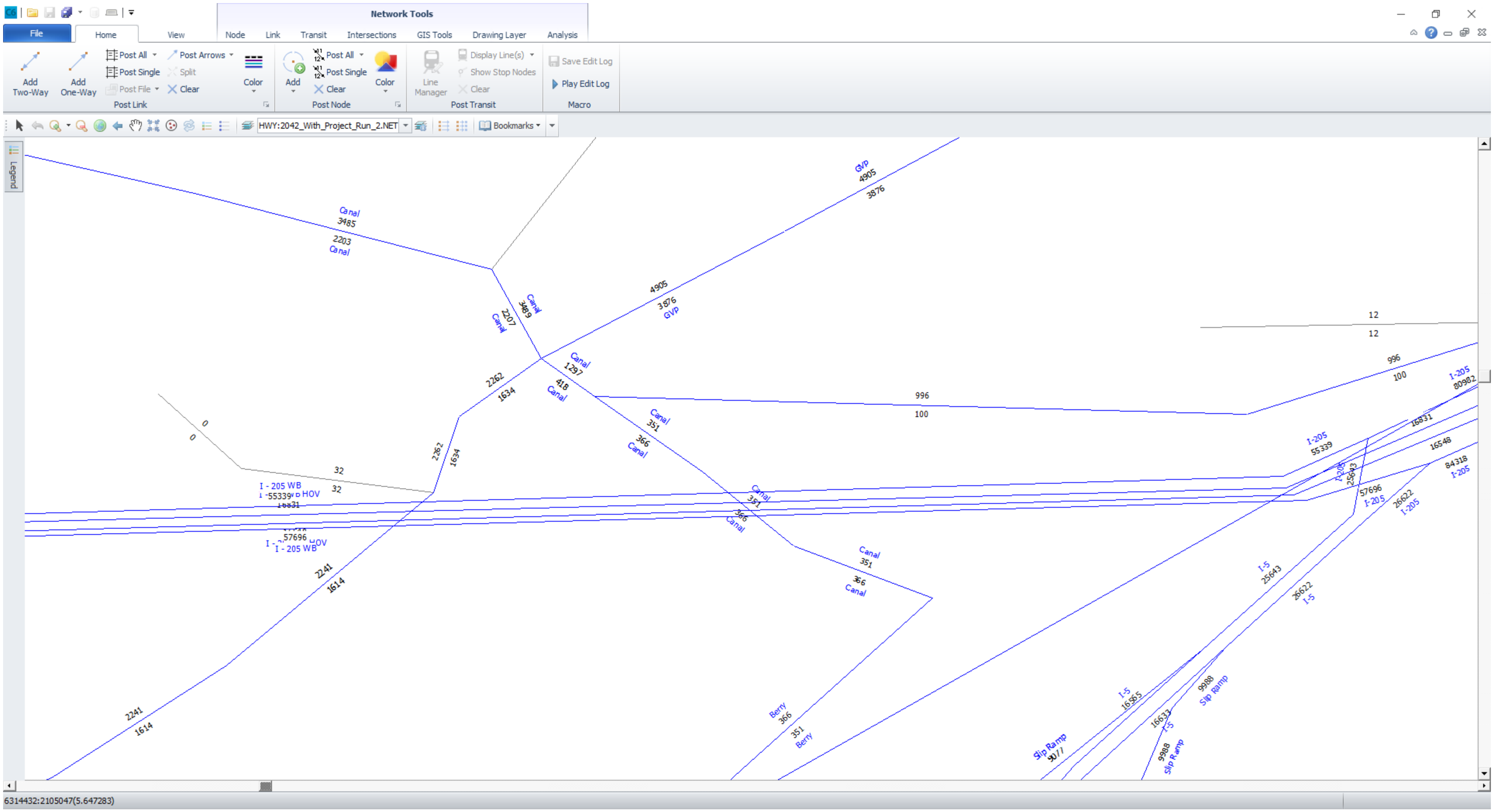
I-205 / Tracy Boulevard interchange– 2040 With Project Average Daily Traffic Volume



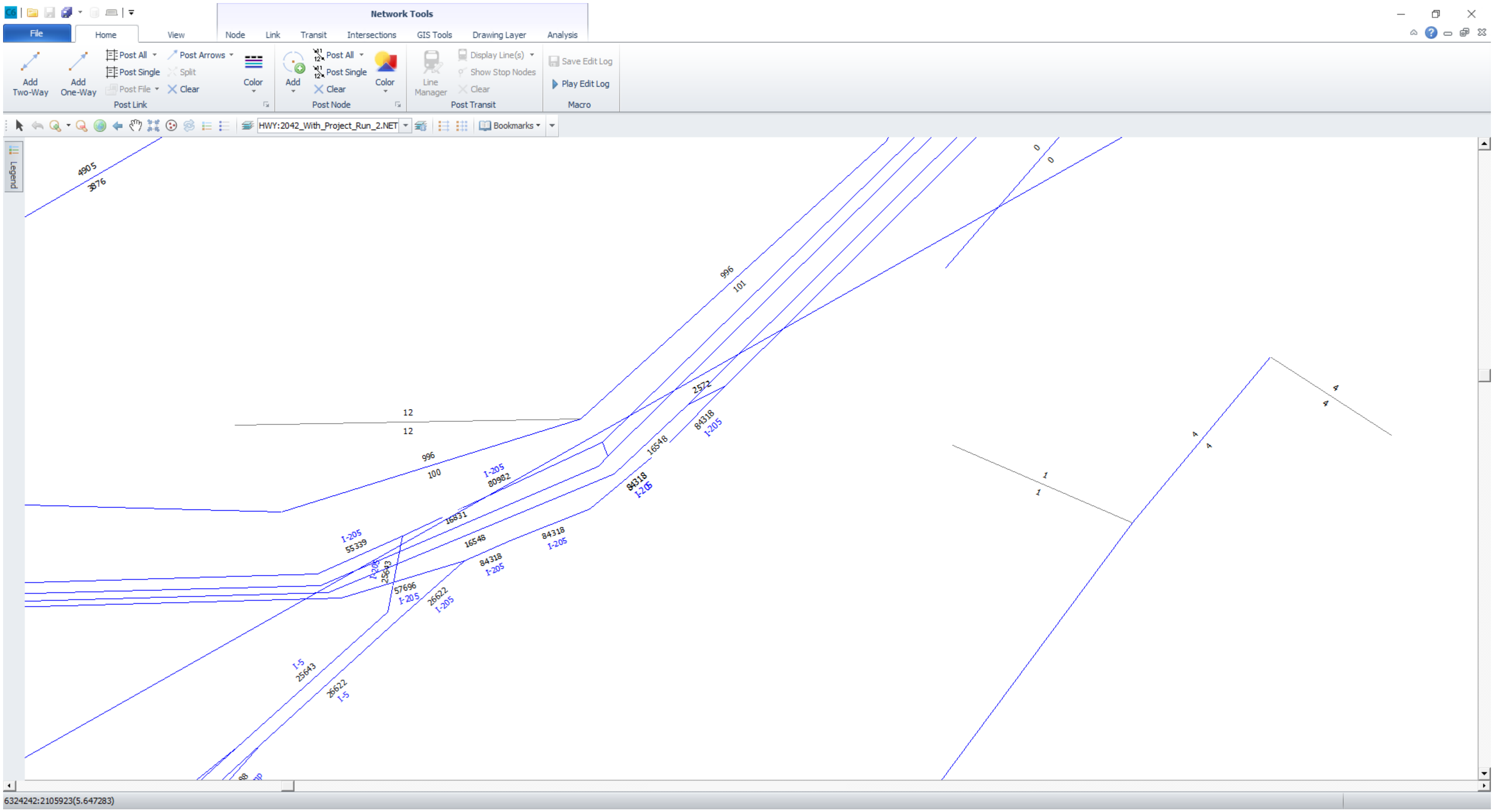
I-205 / MacArthur Drive interchange– 2040 With Project Average Daily Traffic Volume



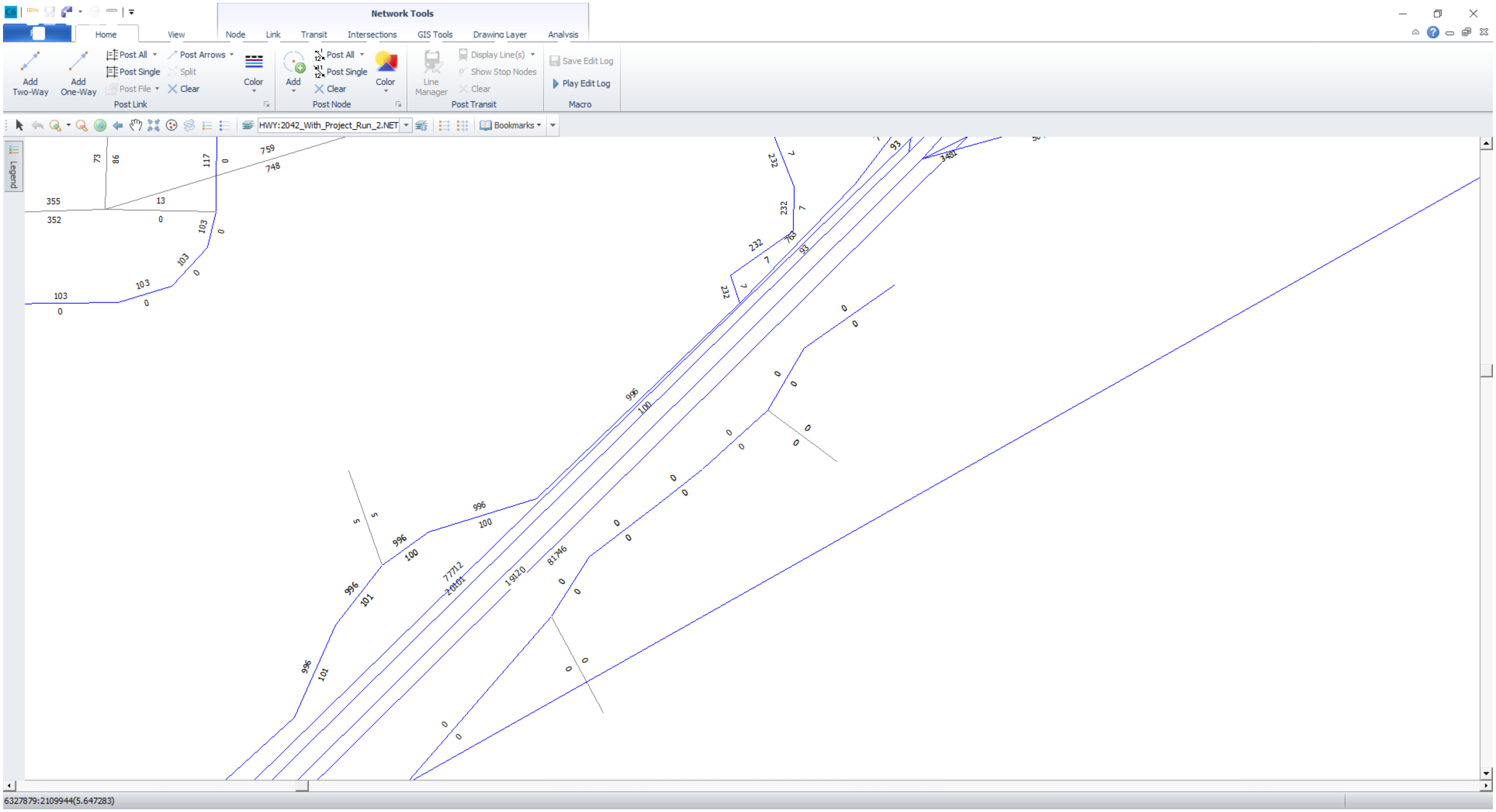
I-205 / Chrisman Road interchange– 2040 With Project Average Daily Traffic Volume



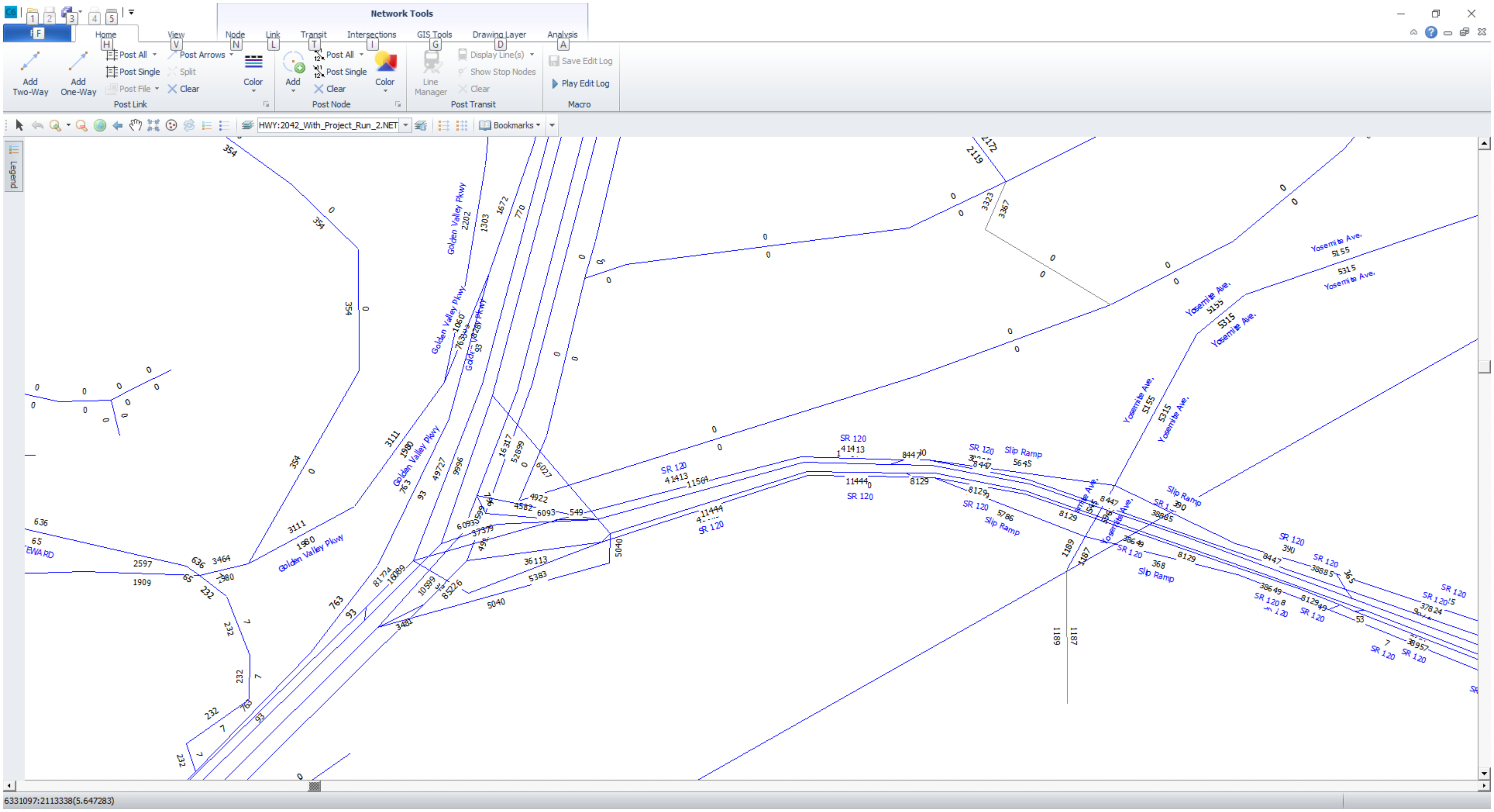
I-205 / I-5 interchange– 2040 With Project Average Daily Traffic Volume



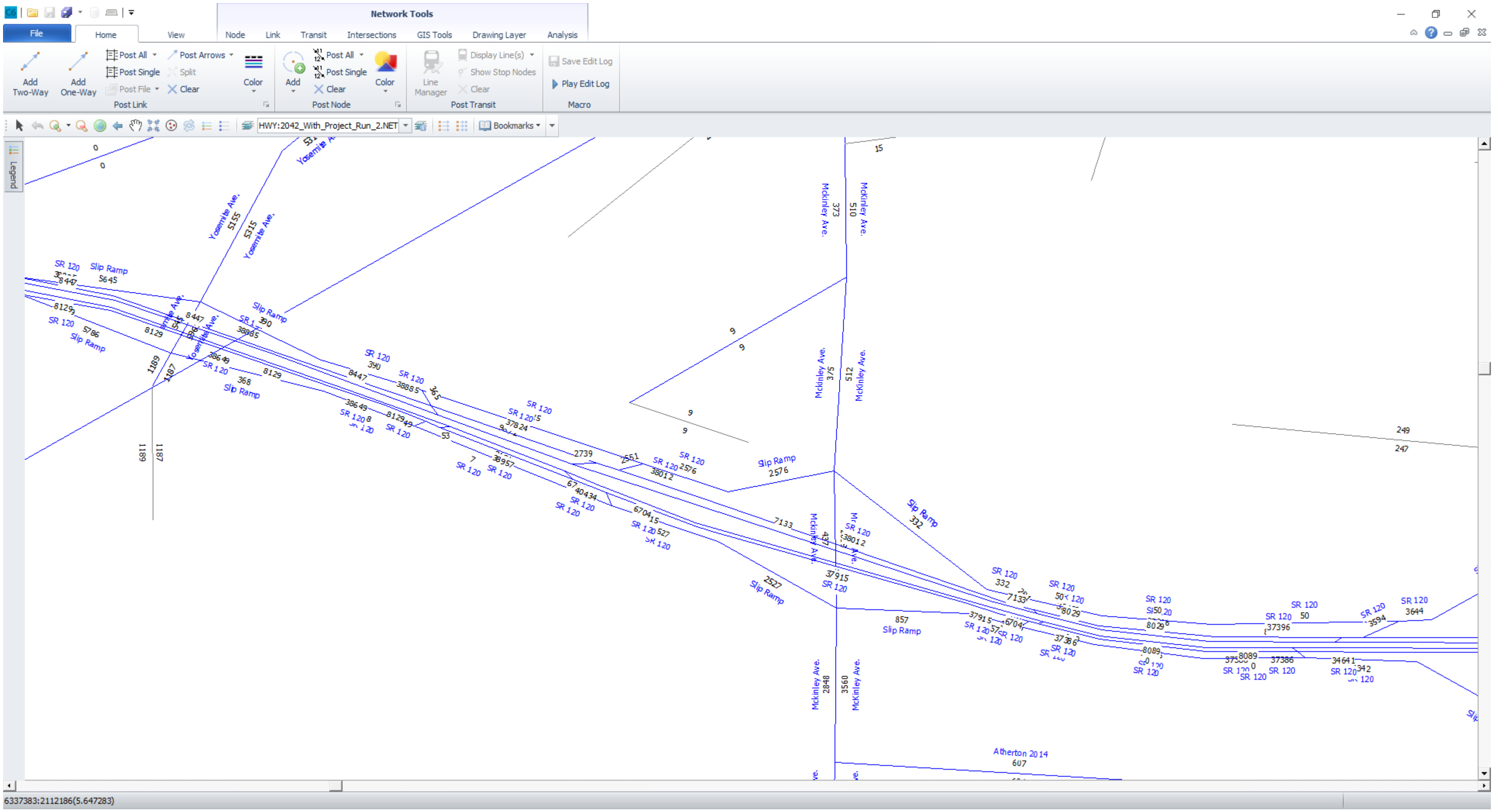
I-205 / I-5 interchange– 2040 With Project Average Daily Traffic Volume



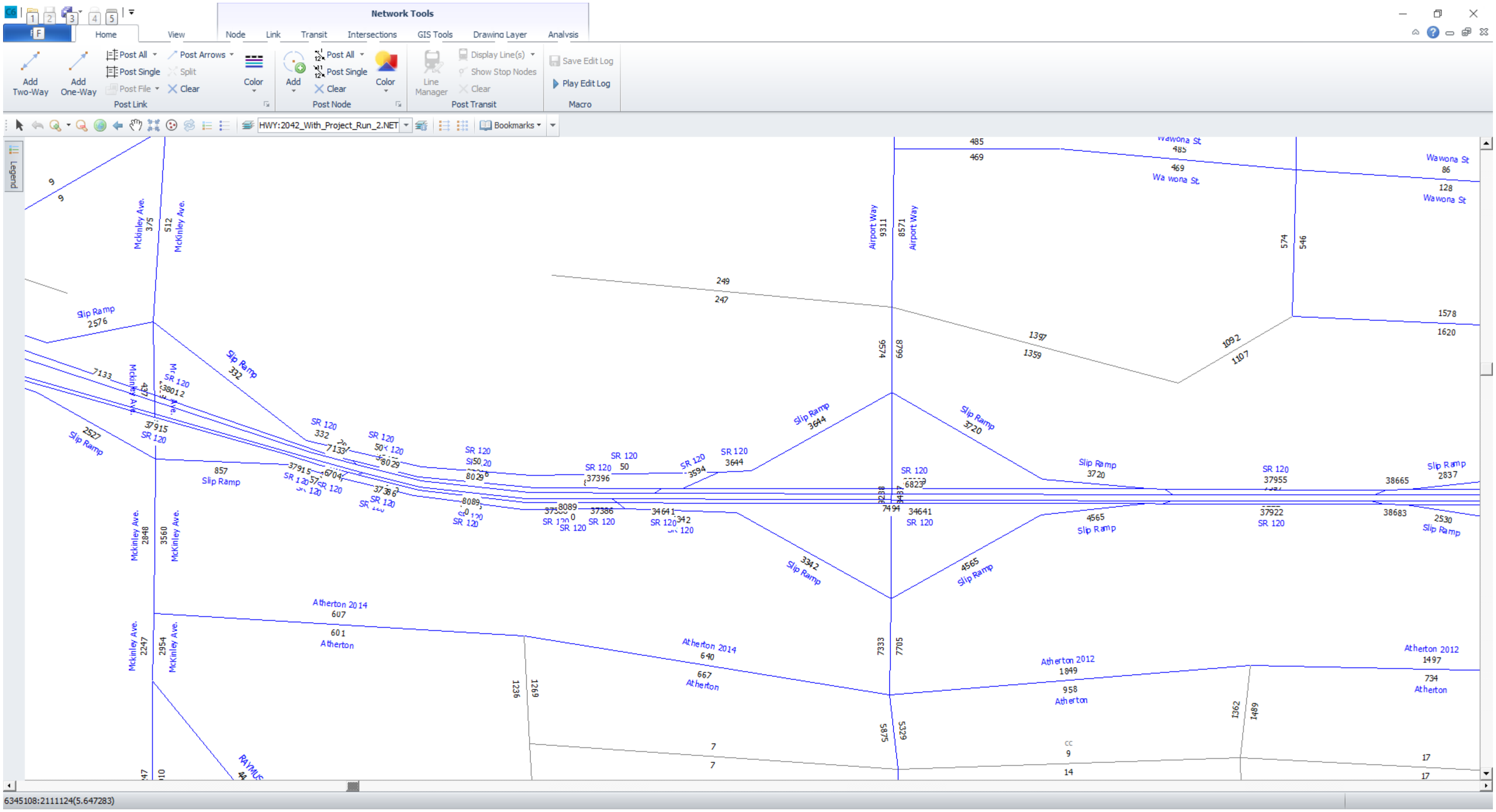
I-5 / Mossdale Road interchange– 2040 With Project Average Daily Traffic Volume



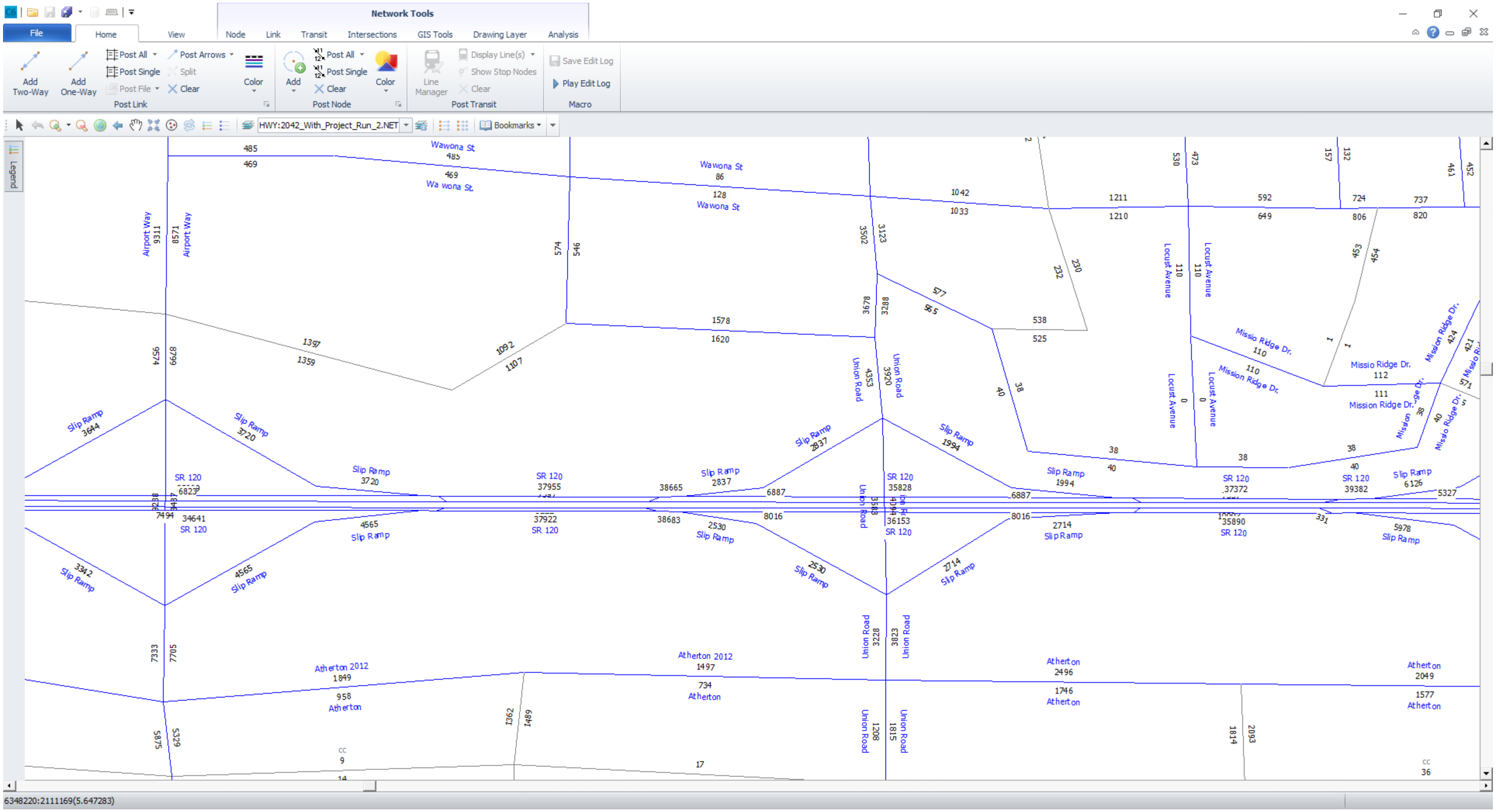
I-5 / SR 120 interchange and SR 120 / Yosemite Avenue interchange – 2040 With Project Average Daily Traffic Volume



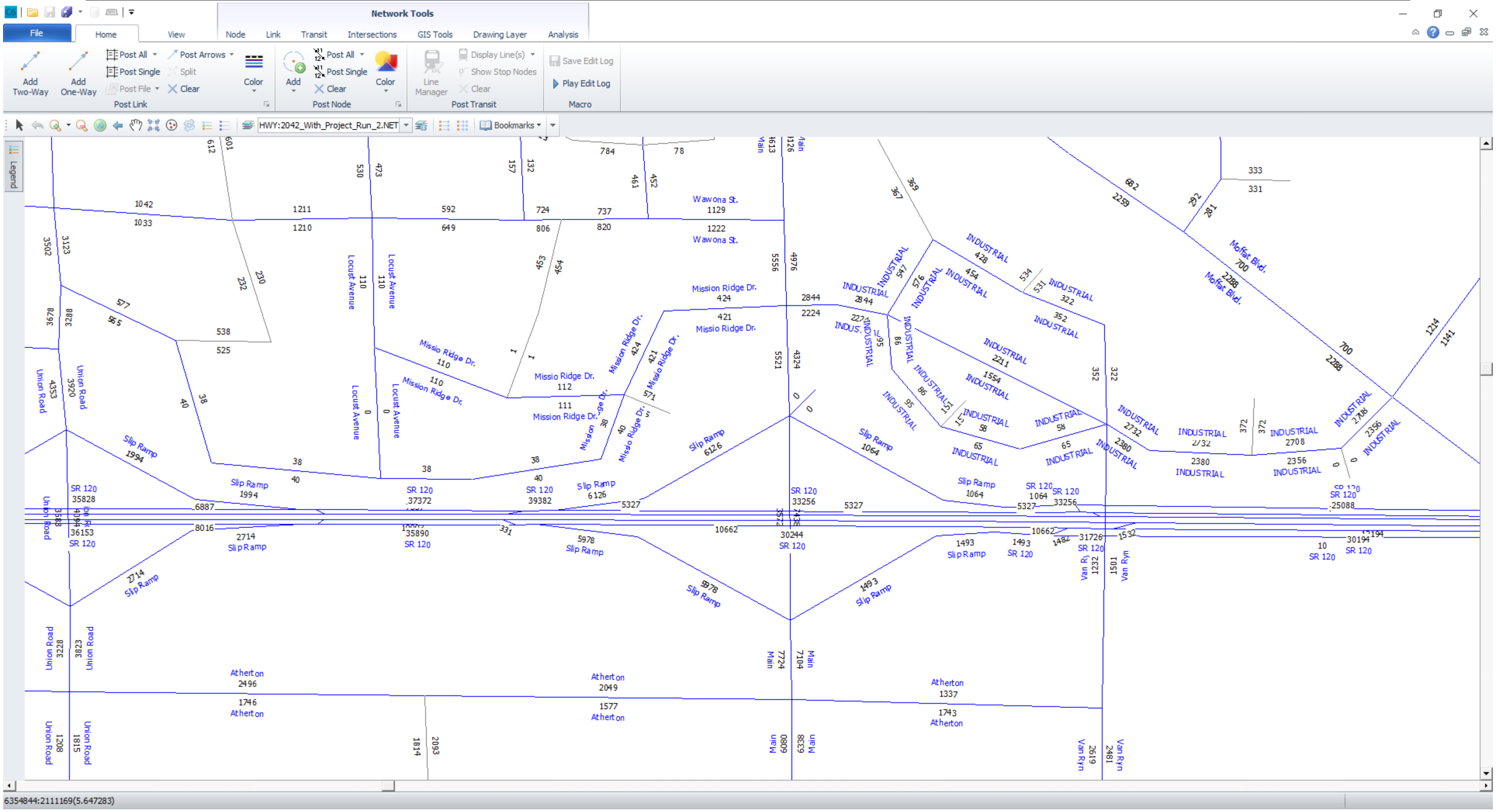
<u>SR 120 / Yosemite Avenue interchange and SR 120 / McKinley Avenue interchange– 2040 With Project Average Daily Traffic Volume</u>



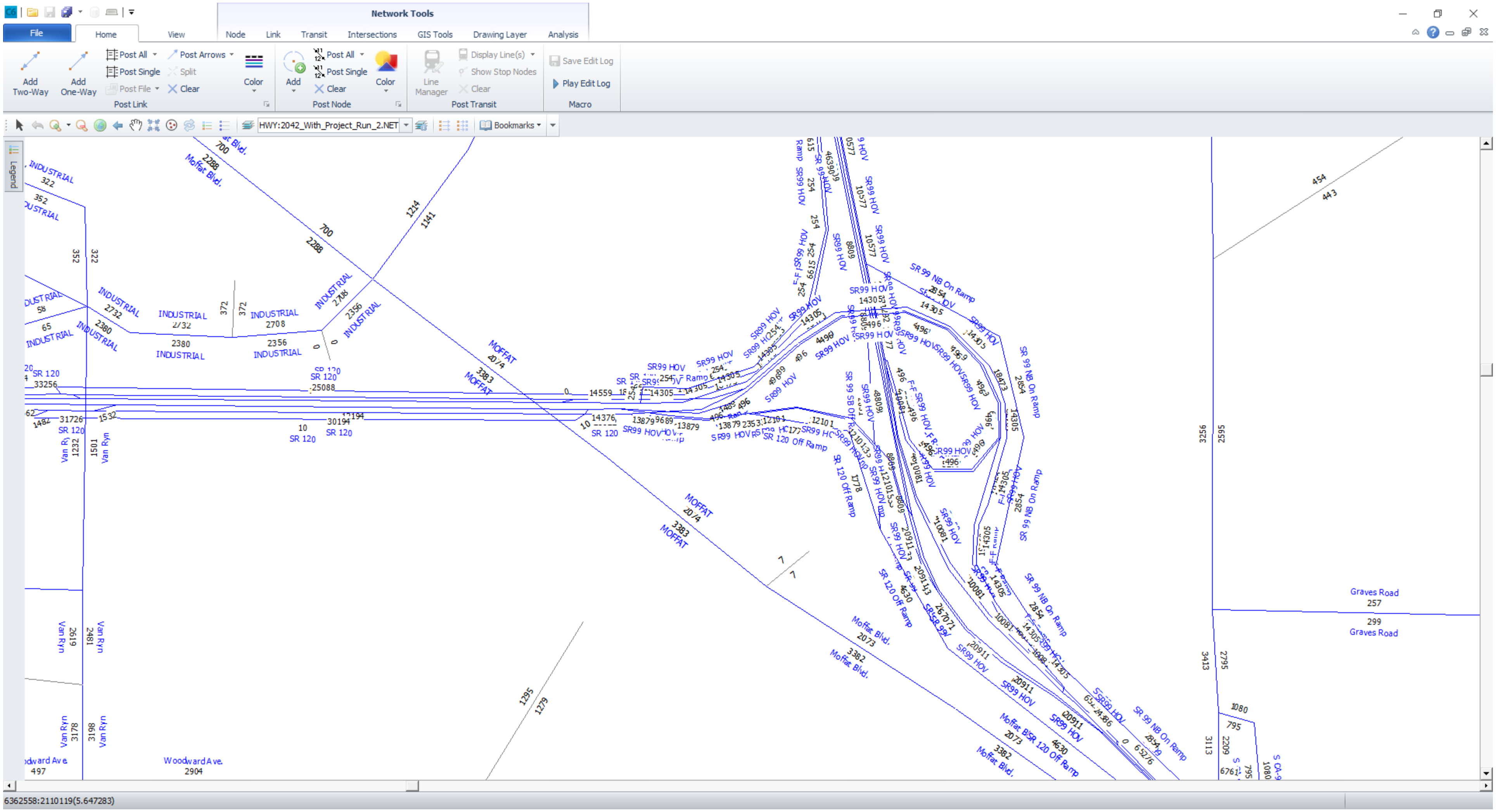
SR 120 / Airport Way interchange – 2040 With Project Average Daily Traffic Volume



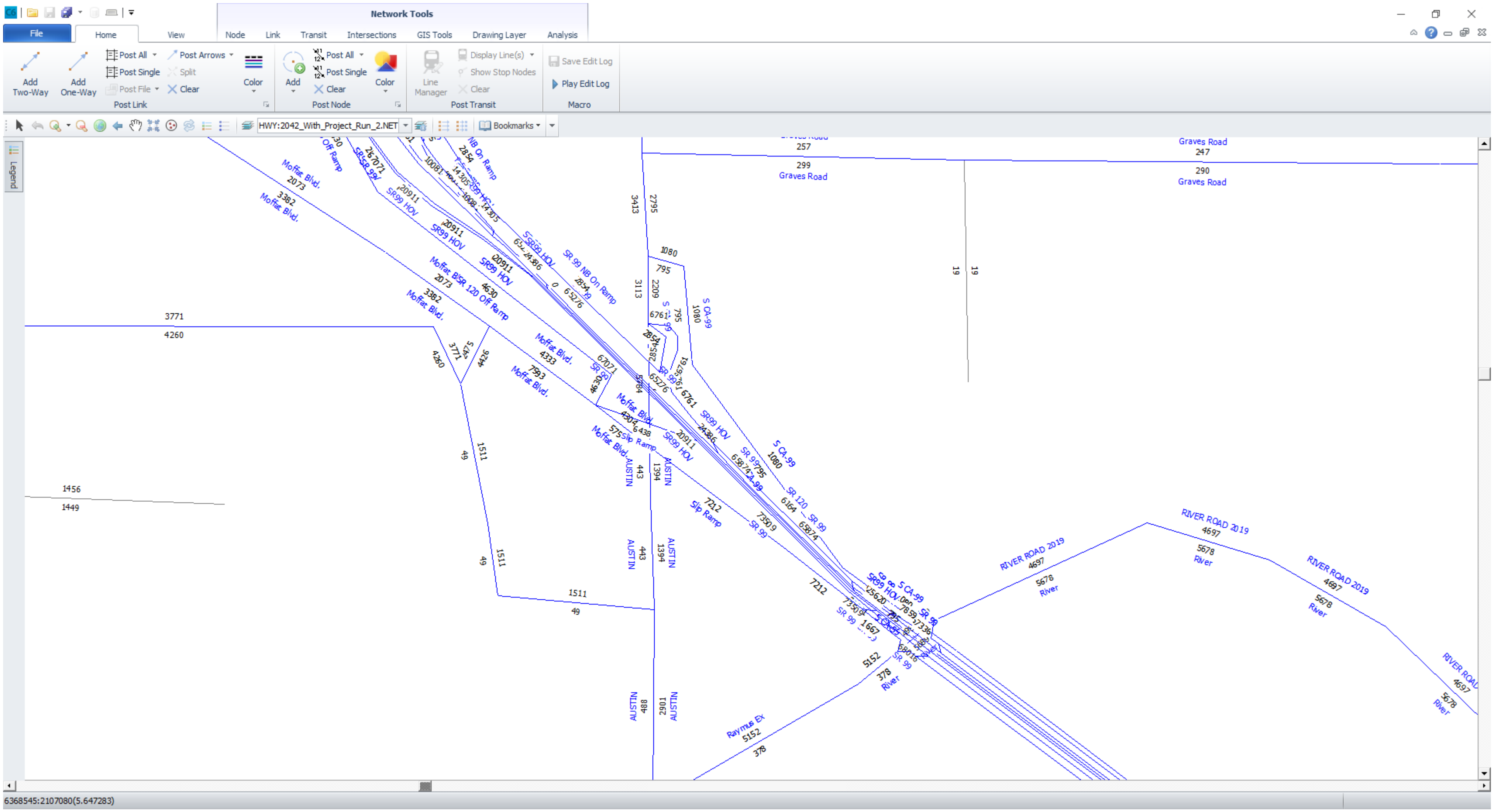
SR 120 / Union Road interchange – 2040 With Project Average Daily Traffic Volume



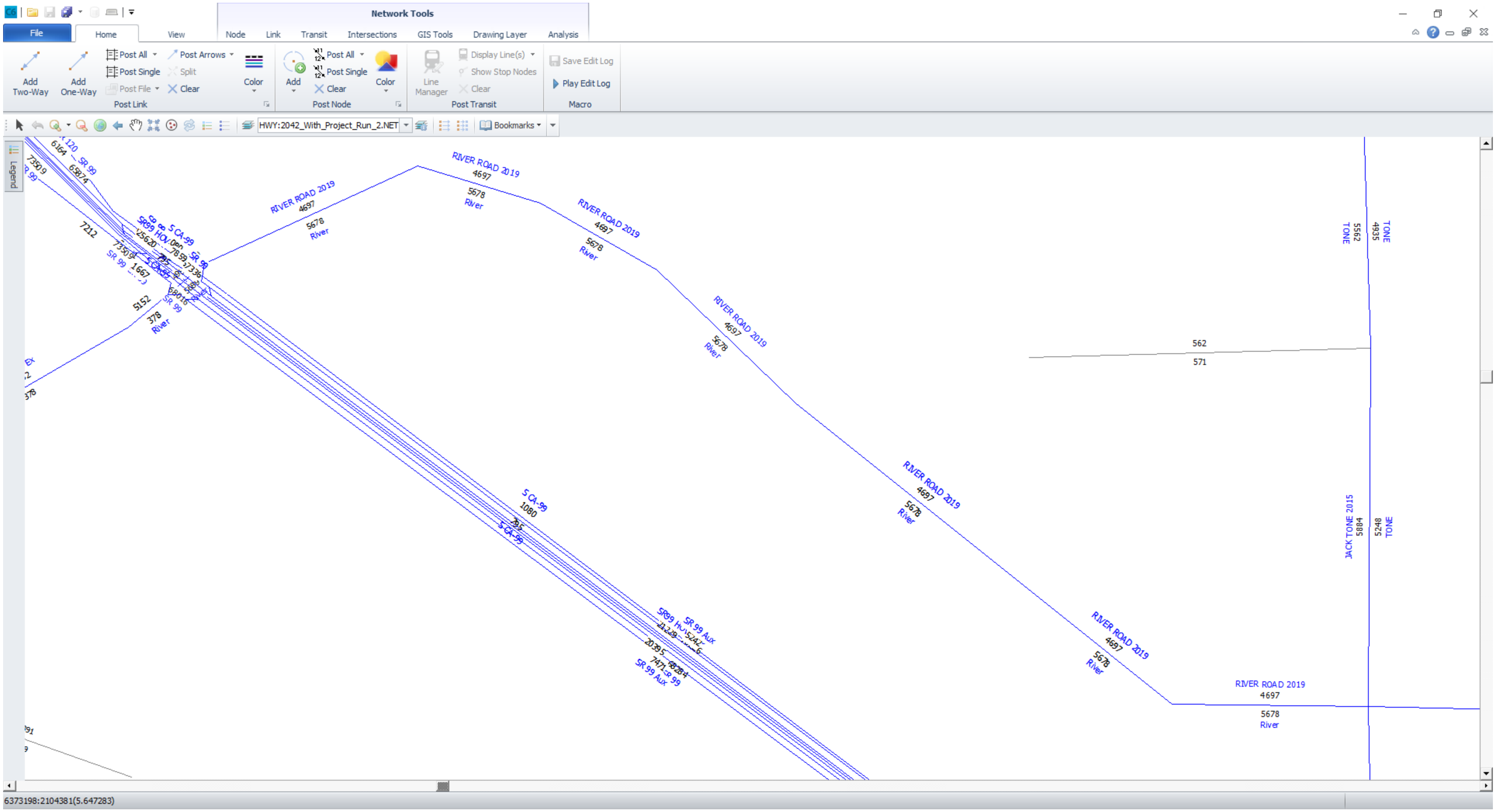
SR 120 / Main Street interchange – 2040 With Project Average Daily Traffic Volume



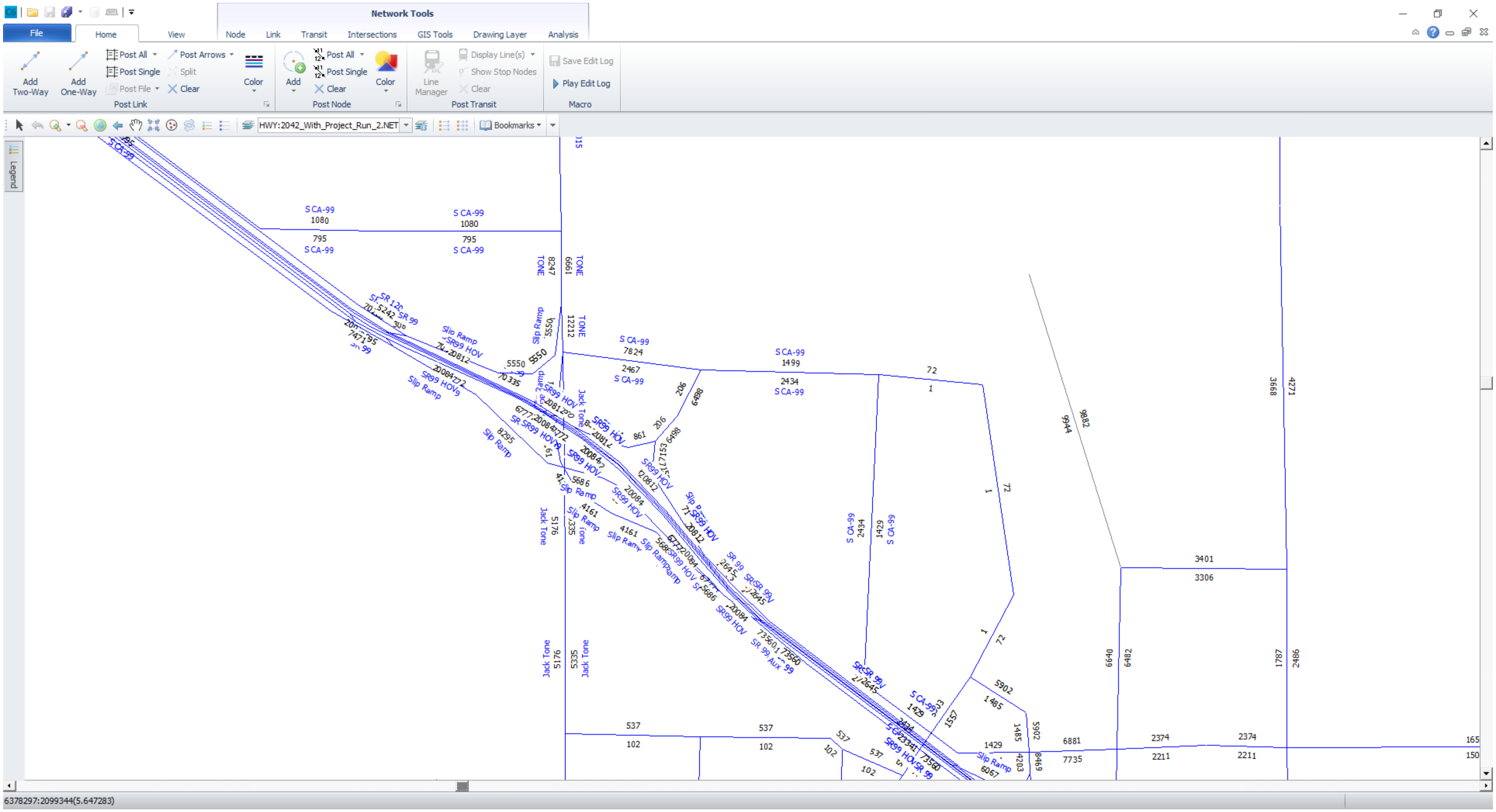
<u>SR 120 / SR 99 interchange – 2040 With Project Average Daily Traffic Volume</u>



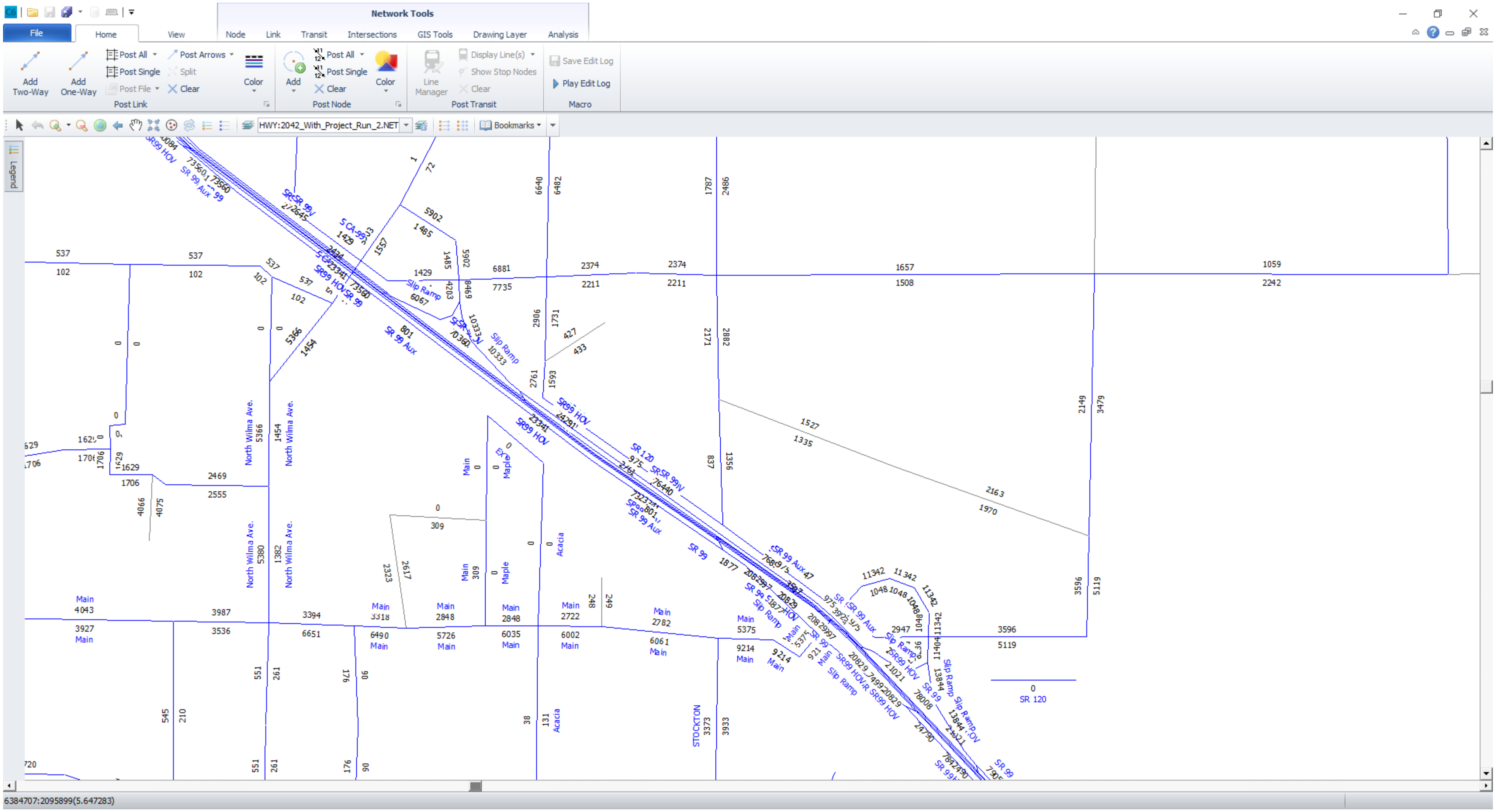
SR 99 / Austin Road interchange – 2040 With Project Average Daily Traffic Volume



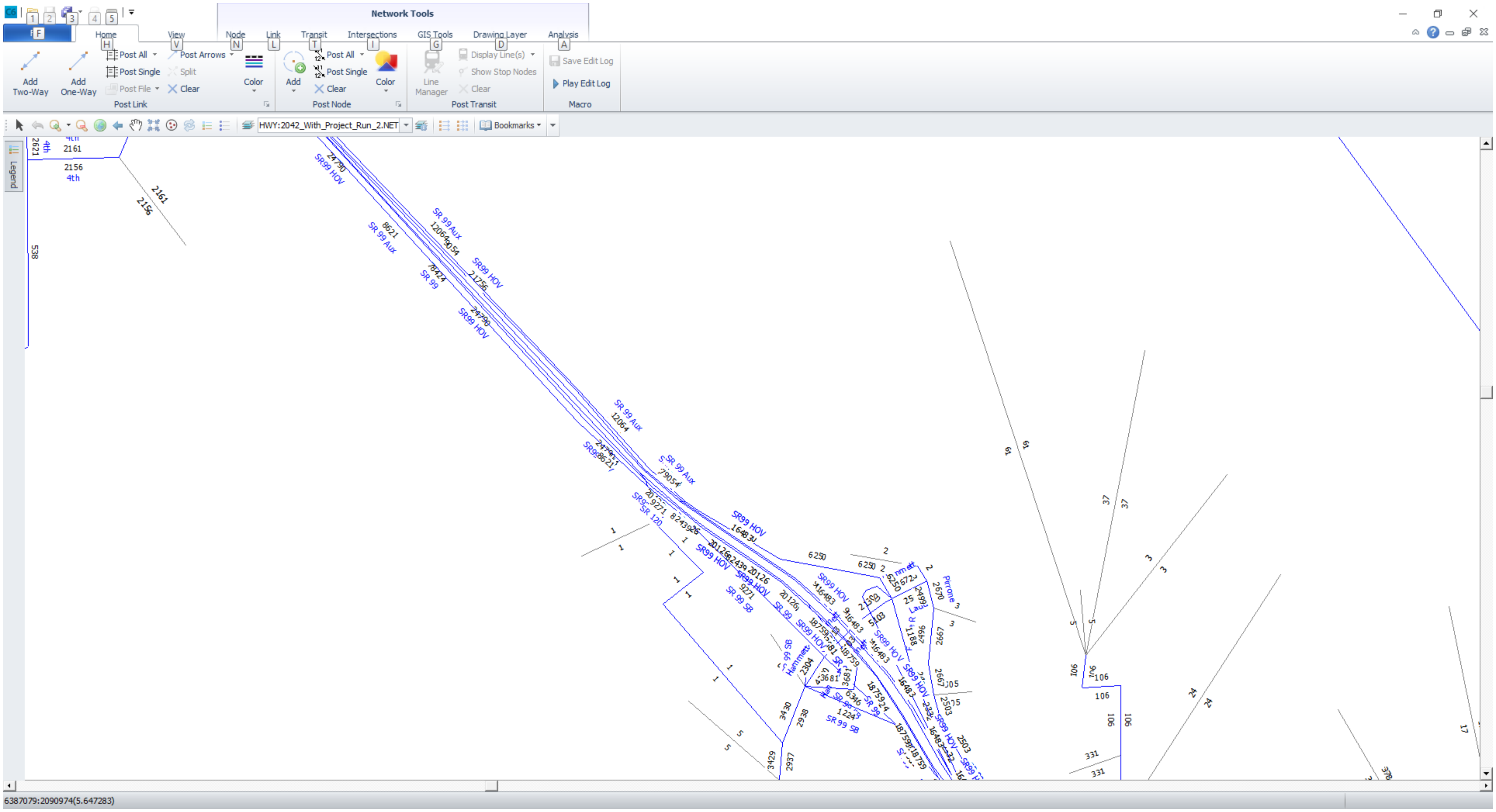
SR 99 between Austin Road and Jack Tone Road – 2040 With Project Average Daily Traffic Volume



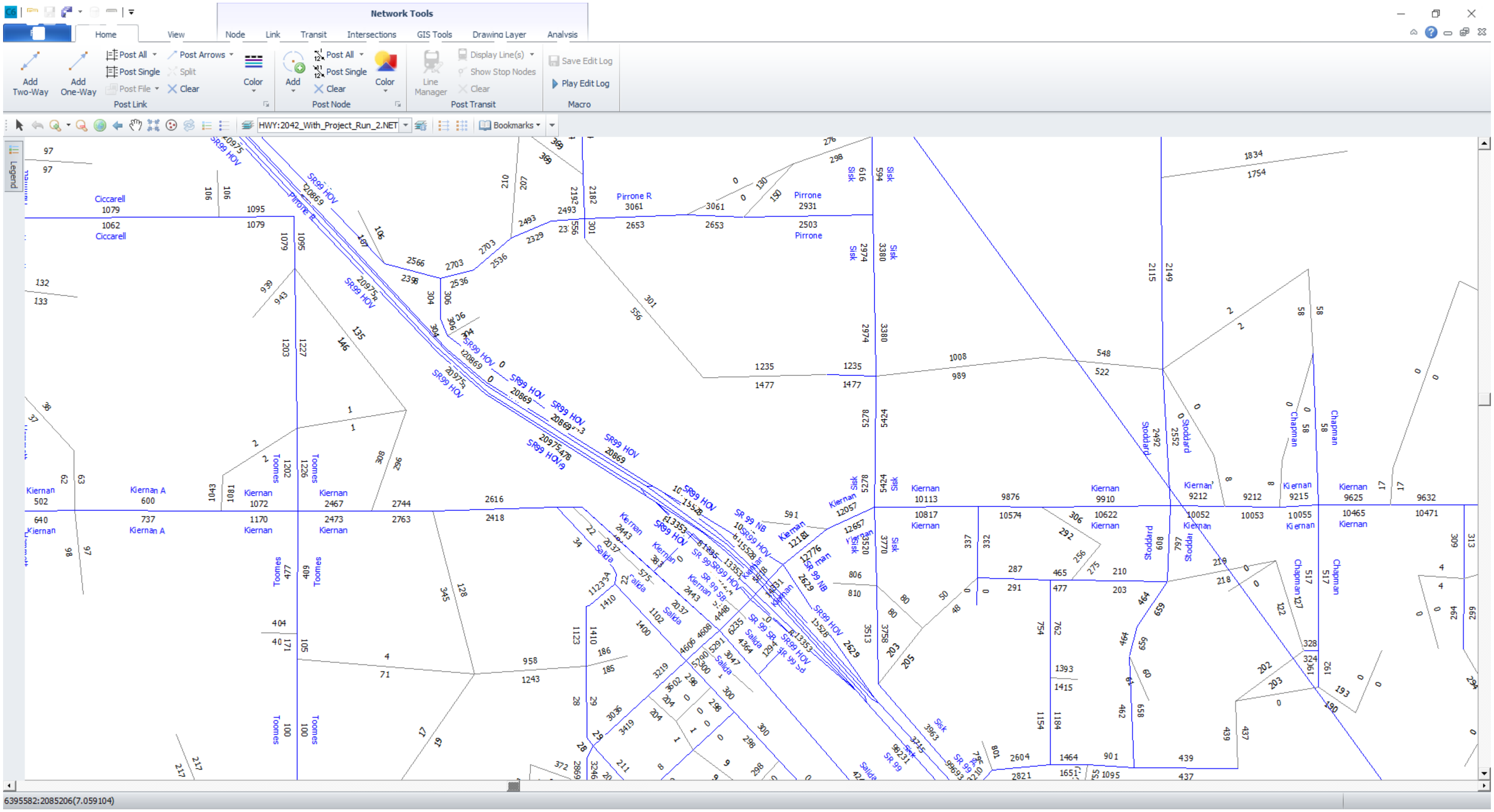
SR 99/ Jack Tone Road interchange– 2040 With Project Average Daily Traffic Volume



SR 99/ Main Street interchange– 2040 With Project Average Daily Traffic Volume



<u>**SR 99/ Hammett Road interchange– 2040 With Project Average Daily Traffic Volume**</u>



SR 99/ Kiernan Avenue interchange– 2040 With Project Average Daily Traffic Volume

APPENDIX B:

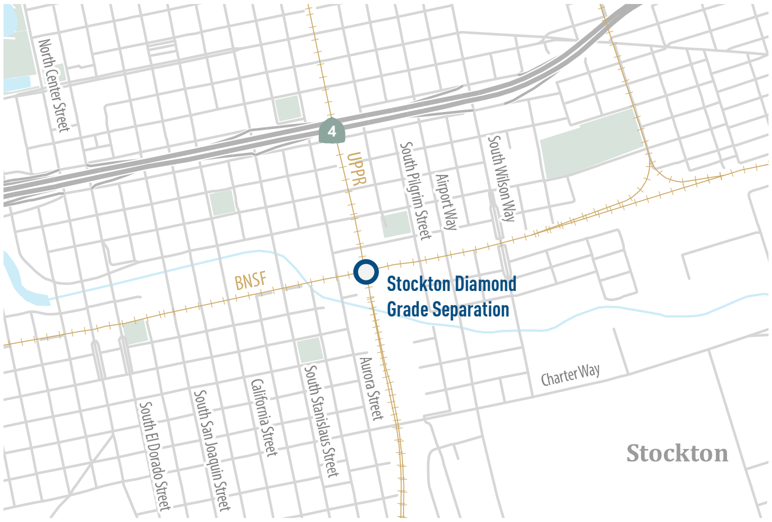
SHORT-TERM (2025), MID-TERM (2030) AND

LONG-TERM (2035) MULTI-MODAL PROJECT FACT SHEETS

SJCOG Congested Corridor Plan -
Recommended Short-Term (2025) Project

SJCOG
CONGESTED CORRIDOR PLAN

Stockton Diamond Grade Separation:



Lead Agency
San Joaquin Regional Rail Commission

Estimated Cost ($)
$272.1 M

Regional Benefit
Improve passenger, commuter and freight rail mobility of heavily trafficked UPRR and BNSF Mainlines

Purpose and Need

The Stockton Diamond Grade Separation project will improve passenger, commuter, and freight rail mobility in the growing San oaquin Valley and Northern California Megaregion. It will also enable job and economic growth in a region that plays a critical role in the United States' vast transportation network. Lead by the San Joaquin Regional Rail Commission (SJRRC), this project will improve the operational efficiency of the regional rail network by eliminating conflicting train movements at the Stockton Diamond. The project will enable growth to continue at the Port of Stockton and will help facilitate the future expansion of Altamont Corridor Express (ACE) commuter and Amtrak San Joaquins intercity service.

Regional Improvement

-25%
Congestion Reduction
Elimination of conflicting train movements

Safety
Reduce vehicle, pedestrian and bicycle collisions

-25%
Air Quality & GHG
Decreased fuel consumption will result in over 90,000 tons of reduced emissions

+40%
Throughput
Improving operation and efficiency of goods movement and passenger service

Economic Vitality
Increase the region's economic competitiveness for moving goods and passengers.

1.3 B/C
Cost Effectiveness
Rate of return on investment = 7.5%

San Joaquin Council of Governments

Caltrans

SJCOG
CONGESTED CORRIDOR PLAN

Stockton Diamond Grade Separation
California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Put hwy design in 1B, safety in 1C & crossing in 1D		
Select project type from list	Hwy-Rail Grade Crossing		
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)		2	
Length of Construction Period	2	years	
One- or Two-Way Data	2	enter 1 or 2	
	Current		
Length of Peak Period(s) (up to 24 hrs)	24	hours	

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		E	E
Number of General Traffic Lanes		2	2
Number of HOV/HOT Lanes			
HOV Restriction (2 or 3)			
Exclusive ROW for Buses (y/n)			
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	35
Length (in miles)	Highway Segment	2.0	2.0
	Impacted Length	2.0	2.0

Average Daily Traffic			
	Current	20,000	
		No Build	Build
	Base (Year 1)	21,738	21,738
	Forecast (Year 20)	38,250	38,250
Average Hourly HOV/HOT Lane Traffic		10	10
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			100%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		35%	35%
Truck Speed		45	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	#DIV/0!
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	1,812	3,188
Departure Rate (in vehicles per hour)	3,600	3,600

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.20	1.20
	Peak	1.20	1.20
High Occupancy Vehicle (if HOV/HOT lanes)		2.10	2.10

1C GRADE CROSSING ACCIDENT DATA

Actual 10-Year Fat & Inj Data or WBAPS Prediction (from FRA)	Count (No.)	Rate
Total Accidents (Tot)	500	0.00
Fatal Accidents (Fat)	5	0.500
Injury Accidents (Inj)	10	1.00
Property Damage Only (PDO) Accidents		0.00

Statewide Basic Average Accident Rate	No Build	Build
Rate Group		
Accident Rate (per million vehicle-miles)	0.26	0.26
Percent Fatal Accidents (Pct Fat)	0.4%	0.4%
Percent Injury Accidents (Pct Inj)	30.6%	30.6%

1D RAIL AND TRANSIT DATA

Annual Person-Trips	No Build	Build
Base (Year 1)	20,000	20,000
Forecast (Year 20)	25,000	25,000
Percent Trips during Peak Period	100%	
Percent New Trips from Parallel Highway		100%

Annual Vehicle-Miles	No Build	Build
Base (Year 1)	50,000	50,000
Forecast (Year 20)	100,000	100,000
Average Vehicles/Train (if rail project)	5	5

Reduction in Transit Accidents		
Percent Reduction (if safety project)	80%	

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains	13,000	13,667	20,000
Avg. Gate Down Time (in min.)	5.0	5.0	5.0

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

SJCOG
CONGESTED CORRIDOR PLAN

Stockton Diamond Grade Separation

California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$267.8
Life-Cycle Benefits (mil. $)	$351.2
Net Present Value (mil. $)	$83.5
Benefit / Cost Ratio:	1.3
Rate of Return on Investment:	7.5%
Payback Period:	11 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$129.8	$134.0	$263.8	$13.2
Veh. Op. Cost Savings	$7.3	$7.1	$14.4	$0.7
Accident Cost Savings	$66.4	$0.0	$66.4	$3.3
Emission Cost Savings	$1.3	$5.3	$6.6	$0.3
TOTAL BENEFITS	$204.9	$146.4	$351.2	$17.6
Person-Hours of Time Saved			23,784,804	1,189,240

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	246	12	$0.0	$0.0
CO_2 Emissions Saved	90,144	4,507	$2.6	$0.1
NO_X Emissions Saved	368	18	$3.9	$0.2
PM_{10} Emissions Saved	1	0	$0.1	$0.0
$PM_{2.5}$ Emissions Saved	1	0		
SO_X Emissions Saved	1	0	$0.0	$0.0
VOC Emissions Saved	30	1	$0.0	$0.0

1E

PROJECT COSTS (enter costs in thousands of dollars)

Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1	$6,000	$6,000	$148,000					$160,000,000	$160,000,000
2			112,000					112,000,000	107,692,308
3								0	0
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
Project Open									
1				$5				$5,000	$4,623
2				5				5,000	4,445
3				5				5,000	4,274
4				5				5,000	4,110
5				5				5,000	3,952
6				5				5,000	3,800
7				5				5,000	3,653
8				5				5,000	3,513
9				5				5,000	3,378
10				5				5,000	3,248
11				5				5,000	3,123
12				5				5,000	3,003
13				5				5,000	2,887
14				5				5,000	2,776
15				5				5,000	2,670
16				5				5,000	2,567
17				5				5,000	2,468
18				5				5,000	2,373
19				5				5,000	2,282
20				5				5,000	2,194
Total	$6,000	$6,000	$260,000	$100	$0	$0	$0	$272,100,000	$267,757,646

SJCOG Congested Corridor Plan -
Recommended Short-Term (2025) Project

SR 99/SR 120 Connector Phase 1B:

Lead Agency
SJCOG/Caltrans

Estimated Cost ($)
$34.9 M

Regional Benefit
Signficantly reduce passenger hours of delay (30%) and increase throughtput (45%). Improve safety and air quality.

Purpose and Need

The completion of the fully funded Phase 1A project will improve traffic flow on eastbound SR 120 onto southbound SR 99. The need for the Phase 1B Project is related to declining level of service on northbound State Route 99 and the potential for future safety issues at the single off-ramp to westbound State Route 120. As traffic volumes continue from Stanislaus County continue to increase on northbound State Route 99, the SR 99 / SR 120 Connector Phase 1B Project would significantly reduce passenger hours of delay by 30% and increase throughput 45% when compared to Year 2040 No Project Conditions. The SR 99 / SR 120 Connector Phase 1B Project would improve safety and air quality.

Regional Improvement

-30%
Congestion Reduction
Elimination of NB 99 to WB SR 120 bottleneck

Safety
Reduce vehicle and truck collisions

-10%
Air Quality & GHG
Decreased fuel consumption will result in 13,000 tons of reduced emissions

+45%
Throughput
Improving operation and movement of passenger cars and trucks

Economic Vitality
Increase the region's economic competitiveness for job creation

3.4 B/C
Cost Effectiveness
Rate of return on investment = 19.4%

San Joaquin Council of Governments
Caltrans

SJCOG Congested Corridor Plan -
Recommended Short-Term (2025) Project

SR 99/SR 120 Connector Phase 1B
California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Check percent traffic in weave in section 1B	
Select project type from list	Freeway Connector	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)	2	
Length of Construction Period	1	years
One- or Two-Way Data	2	enter 1 or 2
	Current	
Length of Peak Period(s) (up to 24 hrs)	6	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		F	F
Number of General Traffic Lanes		6	6
Number of HOV/HOT Lanes		0	0
HOV Restriction (2 or 3)		0	
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	45
Length (in miles)	Highway Segment	0.5	0.5
	Impacted Length	0.6	0.6

Average Daily Traffic			
	Current	118,000	
		No Build	Build
	Base (Year 1)	122,100	122,100
	Forecast (Year 20)	200,000	200,000
Average Hourly HOV/HOT Lane Traffic		0	0
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			0%
Percent Traffic in Weave		2.5%	0.0%
Percent Trucks (include RVs, if applicable)		15%	15%
Truck Speed		55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.39	1.39
	Peak	1.15	1.15
High Occupancy Vehicle (if HOV/HOT lanes)		2.15	2.15

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	60	0.46
Fatal Accidents (Fat)	1	0.008
Injury Accidents (Inj)	10	0.08
Property Damage Only (PDO) Accidents	49	0.38

Statewide Basic Average Accident Rate	No Build	Build
Rate Group	1.00	1.00
Accident Rate (per million vehicle-miles)	1.70	1.50
Percent Fatal Accidents (Pct Fat)	2.0%	1.0%
Percent Injury Accidents (Pct Inj)	98.0%	99.0%

1D RAIL AND TRANSIT DATA

Annual Person-Trips		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Percent Trips during Peak Period		47%	
Percent New Trips from Parallel Highway			100%

Annual Vehicle-Miles		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Average Vehicles/Train (if rail project)			

Reduction in Transit Accidents		
Percent Reduction (if safety project)		

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

SJCOG
CONGESTED CORRIDOR PLAN

SR 99/SR 120 Connector Phase 1B
California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS
SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$34.6
Life-Cycle Benefits (mil. $)	$118.6
Net Present Value (mil. $)	$84.0
Benefit / Cost Ratio:	3.4
Rate of Return on Investment:	19.4%
Payback Period:	6 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$61.8	$14.2	$76.0	$3.8
Veh. Op. Cost Savings	$0.1	$0.5	$0.6	$0.0
Accident Cost Savings	$34.9	$6.2	$41.0	$2.1
Emission Cost Savings	-$0.1	$1.0	$1.0	$0.0
TOTAL BENEFITS	$96.8	$21.8	$118.6	$5.9
Person-Hours of Time Saved			8,029,693	401,485

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	97	5	$0.0	$0.0
CO_2 Emissions Saved	12,821	641	$0.3	$0.0
NO_X Emissions Saved	63	3	$0.7	$0.0
PM_{10} Emissions Saved	0	0	-$0.0	-$0.0
$PM_{2.5}$ Emissions Saved	0	0		
SO_X Emissions Saved	0	0	$0.0	$0.0
VOC Emissions Saved	5	0	$0.0	$0.0

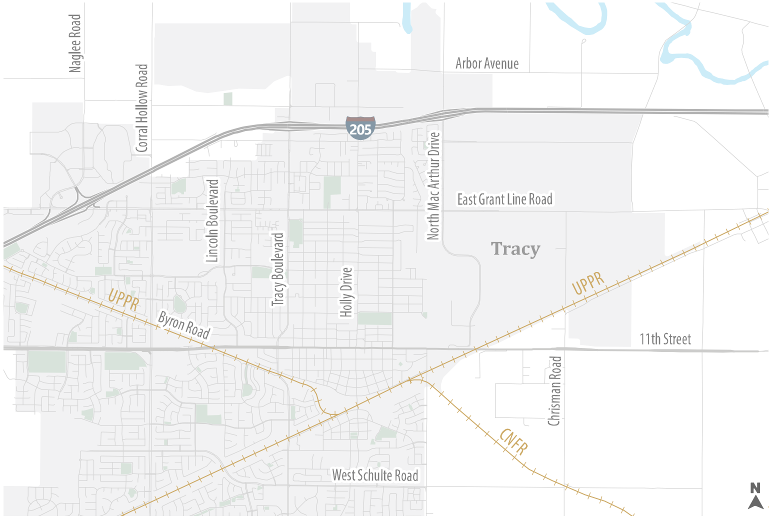
1E

PROJECT COSTS (enter costs in thousands of dollars)

Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1	$2,000	$2,000	$29,936					$33,936,000	$33,936,000
2								0	0
3								0	0
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
Project Open									
1				$25				$25,000	$24,038
2				26				26,000	24,038
3				27				27,000	24,003
4				28				28,000	23,935
5				29				29,000	23,836
6				100				100,000	79,031
7				31				31,000	23,557
8				32				32,000	23,382
9				33				33,000	23,185
10				34				34,000	22,969
11				35				35,000	22,735
12				36				36,000	22,485
13				150				150,000	90,086
14				40				40,000	23,099
15				41				41,000	22,766
16				42				42,000	22,424
17				120				120,000	61,605
18				44				44,000	21,720
19				45				45,000	21,359
20				46				46,000	20,994
Total	$2,000	$2,000	$29,936	$964	$0	$0	$0	$34,900,000	$34,557,249

SJCOG Congested Corridor Plan -
Recommended Short-Term (2025) Project

I-205 Sub-Area Integrated Corridor Management Plan:



Lead Agency
Caltrans/
Local Agencies

Estimated Cost ($)
$48.0 M

Regional Benefit
Reduce congestion on I-205 and parallel City of Tracy, Mountain House, and San Joaquin County local roadways

SJCOG
CONGESTED CORRIDOR PLAN

Purpose and Need

The integrated Corridor Management plan would provide traffic management benefits under recurrent and non-recurrent conditions. Under recurrent conditions, ramp metering, traveler information, and traffic monitoring across jurisdictions enables traffic management staff and drivers to be better-informed of traffic conditions, which can enhance saftey, improve travel time reliability, and provide an opportunity to enhance operational tactics.

Regional Improvement

-20%
Congestion Reduction
Improved traffic flow on freeway and local streets

Safety
Reduce vehicle and truck collisions

-20%
Air Quality & GHG
Decreased fuel consumption will result in 100,000 tons of reduced emissions

+15%
Throughput
Improving operation and movement of passenger cars and trucks

Economic Vitality
Increase the region's economic goal for jobs and housing balance

13.8 B/C
Cost Effectiveness
Rate of return on investment = 52.0%

San Joaquin Council of Governments

Caltrans

I-205 Sub-Area Integrated Corridor Management Plan

California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Enter model data, if avail, in sections 2A & 2C	
Select project type from list	Traveler Information	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)	2	
Length of Construction Period	2	years
One- or Two-Way Data	2	enter 1 or 2
	Current	
Length of Peak Period(s) (up to 24 hrs)	6	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design	No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)	F	F
Number of General Traffic Lanes	6	6
Number of HOV/HOT Lanes	0	0
HOV Restriction (2 or 3)	0	
Exclusive ROW for Buses (y/n)	N	
Highway Free-Flow Speed	65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)	35	35
Length (in miles) Highway Segment	14.0	14.0
Length (in miles) Impacted Length	14.0	14.0

Average Daily Traffic		
Current	170,000	
	No Build	Build
Base (Year 1)	177,619	177,619
Forecast (Year 20)	250,000	250,000
Average Hourly HOV/HOT Lane Traffic		0
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)		100%
Percent Traffic in Weave		0.0%
Percent Trucks (include RVs, if applicable)	10%	10%
Truck Speed	55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)	No Build	Build
IRI (inches/mile) Base (Year 1)		
Forecast (Year 20)		

Average Vehicle Occupancy (AVO)	No Build	Build
General Traffic Non-Peak	1.10	1.10
General Traffic Peak	1.10	1.10
High Occupancy Vehicle (if HOV/HOT lanes)	2.10	2.10

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	800	0.31
Fatal Accidents (Fat)	5	0.002
Injury Accidents (Inj)	250	0.10
Property Damage Only (PDO) Accidents	545	0.21

Statewide Basic Average Accident Rate	No Build	Build
Rate Group		
Accident Rate (per million vehicle-miles)	0.10	0.10
Percent Fatal Accidents (Pct Fat)	0.4%	0.4%
Percent Injury Accidents (Pct Inj)	30.0%	30.0%

1D RAIL AND TRANSIT DATA

Annual Person-Trips	No Build	Build
Base (Year 1)		
Forecast (Year 20)		
Percent Trips during Peak Period	47%	
Percent New Trips from Parallel Highway		100%

Annual Vehicle-Miles	No Build	Build
Base (Year 1)		
Forecast (Year 20)		
Average Vehicles/Train (if rail project)		

Reduction in Transit Accidents		
Percent Reduction (if safety project)		

Average Transit Travel Time	No Build	Build
In-Vehicle Non-Peak (in minutes)		0.0
In-Vehicle Peak (in minutes)		0.0
Out-of-Vehicle Non-Peak (in minutes)	0.0	0.0
Out-of-Vehicle Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

I-205 Sub-Area Integrated Corridor Management Plan
California Life-Cycle Benefit/Cost Analysis Model:

(3)

INVESTMENT ANALYSIS
SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$47.1
Life-Cycle Benefits (mil. $)	$649.3
Net Present Value (mil. $)	$602.1
Benefit / Cost Ratio:	13.8
Rate of Return on Investment:	52.0%
Payback Period:	2 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$363.4	$148.3	$511.7	$25.6
Veh. Op. Cost Savings	$74.3	$22.8	$97.1	$4.9
Accident Cost Savings	$22.5	$2.5	$25.0	$1.3
Emission Cost Savings	$7.4	$8.1	$15.4	$0.8
TOTAL BENEFITS	$467.6	$181.7	$649.3	$32.5
Person-Hours of Time Saved			51,746,043	2,587,302

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y (Default = Y)
2) Vehicle Operating Costs? (y/n)	Y (Default = Y)
3) Accident Costs? (y/n)	Y (Default = Y)
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y (Default = Y)

EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	12,728	636	-$9.6	-$0.5
CO_2 Emissions Saved	23,599	1,180	$10.6	$0.5
NO_X Emissions Saved	12,767	638	-$2,258.8	-$112.9
PM_{10} Emissions Saved	12,808	640	-$18,303.6	-$915.2
$PM_{2.5}$ Emissions Saved	12,808	640		
SO_X Emissions Saved	12,808	640	-$9,145.7	-$457.3
VOC Emissions Saved	12,800	640	-$158.0	-$7.9

(1E)

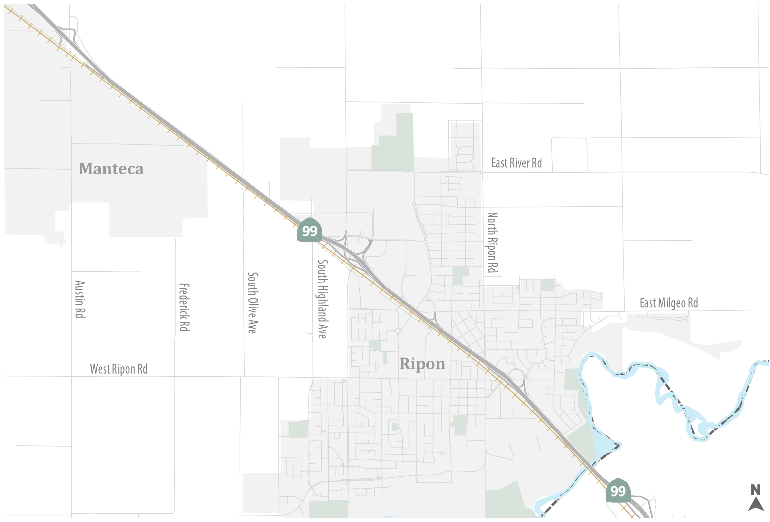
PROJECT COSTS (enter costs in thousands of dollars)

Year	DIRECT PROJECT COSTS: INITIAL COSTS: Project Support (1)	R / W (2)	Construction (3)	SUBSEQUENT COSTS: Maint./Op. (4)	Rehab. (5)	Mitigation (6)	Transit Agency Cost Savings (7)	TOTAL COSTS (in dollars): Constant Dollars	Present Value
Construction Period									
1	$1,000	$2,000	$23,450					$26,450,000	$26,450,000
2	1,000	2,000	18,450					21,450,000	20,625,000
3								0	0
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
Project Open									
1				$5				$5,000	$4,623
2				5				5,000	4,445
3				5				5,000	4,274
4				5				5,000	4,110
5				5				5,000	3,952
6				5				5,000	3,800
7				5				5,000	3,653
8				5				5,000	3,513
9				5				5,000	3,378
10				5				5,000	3,248
11				5				5,000	3,123
12				5				5,000	3,003
13				5				5,000	2,887
14				5				5,000	2,776
15				5				5,000	2,670
16				5				5,000	2,567
17				5				5,000	2,468
18				5				5,000	2,373
19				5				5,000	2,282
20				5				5,000	2,194
Total	$2,000	$4,000	$41,900	$100	$0	$0	$0	$48,000,000	$47,140,338

SJCOG Congested Corridor Plan -
Recommended Short-Term (2025) Project

SJCOG CONGESTED CORRIDOR PLAN

SR 99 Sub-Area Integrated Corridor Management Plan:



Lead Agency
Caltrans/
Local Agencies

Estimated Cost ($)
$21.5 M

Regional Benefit
Reduce congestion on SR99 between SR120 and the Stanislaus River

Purpose and Need

The integrated Corridor Management plan would provide traffic management benefits under recurrent and non-recurrent conditions. Under recurrent conditions, ramp metering, traveler information, and traffic monitoring across jurisdictions enables traffic management staff and drivers to be better-informed of traffic conditions, which can enhance saftey, improve travel time reliability, and provide an opportunity to enhance operational tactics.

Regional Improvement

-30%
Congestion Reduction
Improved traffic flow on major corridor between San Joaquin and Stanislaus Counties

Safety
Reduce vehicle and truck collisions

-35%
Air Quality & GHG
Decreased fuel consumption will result in 150,000 tons of reduced emissions

+30%
Throughput
Improving operation and efficiency of travel for passenger cars and trucks

Economic Vitality
Increase the region's economic goal for jobs and housing balance

11.5 B/C
Cost Effectiveness
Rate of return on investment = 37.2%

SAN JOAQUIN COUNCIL OF GOVERNMENTS
Caltrans

SJCOG
CONGESTED CORRIDOR PLAN

SR 99 Sub-Area Integrated Corridor Management Plan

California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Enter model data, if avail, in sections 2A & 2C		
Select project type from list	Ramp Metering		
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)		2	
Length of Construction Period	1	years	
One- or Two-Way Data	2	enter 1 or 2	
	Current		
Length of Peak Period(s) (up to 24 hrs)	6	hours	

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		F	F
Number of General Traffic Lanes		6	6
Number of HOV/HOT Lanes		0	0
HOV Restriction (2 or 3)		0	
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	45
Length (in miles)	Highway Segment	5.0	5.0
	Impacted Length	5.0	5.0

Average Daily Traffic			
	Current	118,000	
		No Build	Build
	Base (Year 1)	122,100	122,100
	Forecast (Year 20)	200,000	200,000
Average Hourly HOV/HOT Lane Traffic		0	0
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			0%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		15%	15%
Truck Speed		55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.39	1.39
	Peak	1.15	1.15
High Occupancy Vehicle (if HOV/HOT lanes)		2.15	2.15

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	100	0.15
Fatal Accidents (Fat)	1	0.002
Injury Accidents (Inj)	30	0.05
Property Damage Only (PDO) Accidents	69	0.11

Statewide Basic Average Accident Rate	No Build	Build
Rate Group	1.00	1.00
Accident Rate (per million vehicle-miles)	1.70	1.50
Percent Fatal Accidents (Pct Fat)	2.0%	1.0%
Percent Injury Accidents (Pct Inj)	98.0%	99.0%

1D RAIL AND TRANSIT DATA

Annual Person-Trips		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Percent Trips during Peak Period		47%	
Percent New Trips from Parallel Highway			100%

Annual Vehicle-Miles		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Average Vehicles/Train (if rail project)			

Reduction in Transit Accidents		
Percent Reduction (if safety project)		

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

SR 99 Sub-Area Integrated Corridor Management Plan

California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$21.2
Life-Cycle Benefits (mil. $)	$243.1
Net Present Value (mil. $)	$222.0
Benefit / Cost Ratio:	11.5
Rate of Return on Investment:	37.2%
Payback Period:	4 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$92.5	$33.1	$125.6	$6.3
Veh. Op. Cost Savings	$24.7	$7.0	$31.7	$1.6
Accident Cost Savings	$45.4	$8.0	$53.5	$2.7
Emission Cost Savings	$29.6	$2.8	$32.5	$1.6
TOTAL BENEFITS	$192.2	$50.9	$243.1	$12.2
Person-Hours of Time Saved			14,362,678	718,134

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	20,996	1,050	$23.0	$1.2
CO_2 Emissions Saved	24,686	1,234	$17.3	$0.9
NO_X Emissions Saved	20,995	1,050	$5,386.4	$269.3
PM_{10} Emissions Saved	20,987	1,049	$43,506.2	$2,175.3
$PM_{2.5}$ Emissions Saved	20,987	1,049		
SO_X Emissions Saved	20,987	1,049	$21,738.7	$1,086.9
VOC Emissions Saved	20,988	1,049	$375.8	$18.8

1E

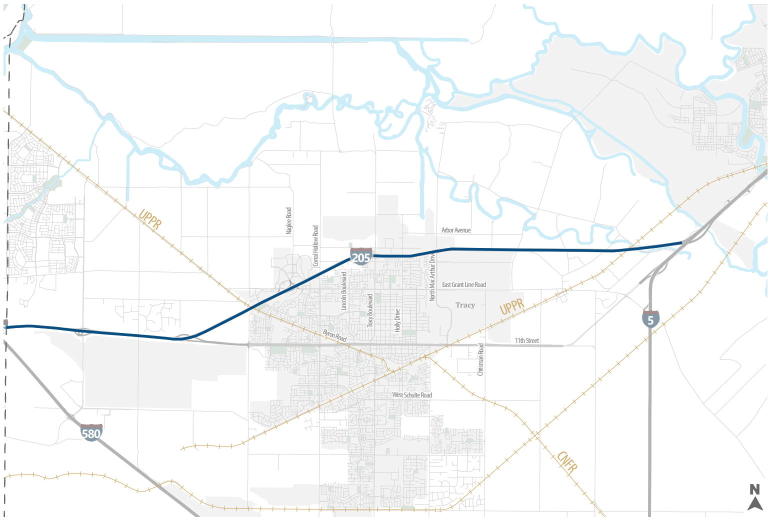
PROJECT COSTS (enter costs in thousands of dollars)

Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1	$1,000	$1,000	$18,536					$20,536,000	$20,536,000
2								0	0
3								0	0
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
Project Open									
1				$25				$25,000	$24,038
2				26				26,000	24,038
3				27				27,000	24,003
4				28				28,000	23,935
5				29				29,000	23,836
6				100				100,000	79,031
7				31				31,000	23,557
8				32				32,000	23,382
9				33				33,000	23,185
10				34				34,000	22,969
11				35				35,000	22,735
12				36				36,000	22,485
13				150				150,000	90,086
14				40				40,000	23,099
15				41				41,000	22,766
16				42				42,000	22,424
17				120				120,000	61,605
18				44				44,000	21,720
19				45				45,000	21,359
20				46				46,000	20,994
Total	$1,000	$1,000	$18,536	$964	$0	$0	$0	$21,500,000	$21,157,249

SJCOG Congested Corridor Plan -
Recommended Mid-Term (2030) Project

SJCOG
CONGESTED CORRIDOR PLAN

I-205 High Occupancy Vehicle Lane (Carpool) or Express Lane from County Line to I-5:



Lead Agency
SJCOG/Caltrans

Estimated Cost ($)
$500.0 M

Regional Benefit
Reduce congestion on I-205 between I-580 and I-5

Purpose and Need

The construction of the HOV/Transit/Express Lane on westbound I-205 will reduce passenger hours of delay by up to 65% from Interstate 5 to the I-205 / I-580 freeway to freeway interchange during the morning peak period. In addition, the mode split would increase as carpool and transit passengers would have a dedicated travel lane for approximately 14 miles. This would result in a 40% increase in passenger throughput during the morning peak period from Interstate 5 to the I-205 / I-580 interchange during the morning peak period.

Regional Improvement

-40%
Congestion Reduction
Elimination of major bottleneck to and from the Bay Area Mega Region

Safety
Reduce vehicle and truck collisions

-35%
Air Quality & GHG
Decreased fuel consumption will result in 2.4M tons of reduced emissions

+40%
Throughput
Improving operation and movement of passenger cars and trucks

Economic Vitality
Increase the region's economic competitiveness for jobs and housing

8.6 B/C
Cost Effectiveness
Rate of return on investment = 15.2%

San Joaquin Council of Governments
Caltrans

SJCOG CONGESTED CORRIDOR PLAN

I-205 High Occupancy Vehicle Lane (Carpool) or Express Lane from County Line to I-5

California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Include toll payers as HOVs & check AVOs	
Select project type from list	HOT Lane Addition	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)	2	
Length of Construction Period	5	years
One- or Two-Way Data	2	enter 1 or 2
	Current	
Length of Peak Period(s) (up to 24 hrs)	8	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

		No Build	Build
Highway Design			
Roadway Type (Fwy, Exp, Conv Hwy)		F	F
Number of General Traffic Lanes		6	6
Number of HOV/HOT Lanes		0	2
HOV Restriction (2 or 3)		2	
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	35
Length (in miles)	Highway Segment	14.0	14.0
	Impacted Length	14.0	14.0

Average Daily Traffic			
	Current	170,000	
		No Build	Build
	Base (Year 1)	186,667	186,667
	Forecast (Year 20)	250,000	250,000
Average Hourly HOV/HOT Lane Traffic		4,100	4,100
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			100%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		10%	10%
Truck Speed		55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.10	1.10
	Peak	1.10	1.10
High Occupancy Vehicle (if HOV/HOT lanes)		2.10	2.10

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	800	0.31
Fatal Accidents (Fat)	5	0.002
Injury Accidents (Inj)	250	0.10
Property Damage Only (PDO) Accidents	545	0.21

Statewide Basic Average Accident Rate	No Build	Build
Rate Group		
Accident Rate (per million vehicle-miles)	0.10	0.10
Percent Fatal Accidents (Pct Fat)	0.4%	0.4%
Percent Injury Accidents (Pct Inj)	30.0%	30.0%

1D RAIL AND TRANSIT DATA

Annual Person-Trips		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Percent Trips during Peak Period		61%	
Percent New Trips from Parallel Highway			100%

Annual Vehicle-Miles		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Average Vehicles/Train (if rail project)			

Reduction in Transit Accidents	
Percent Reduction (if safety project)	

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

Caltrans

SJCOG
CONGESTED CORRIDOR PLAN

I-205 High Occupancy Vehicle Lane (Carpool) or Express Lane from County Line to I-5

California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$463.0
Life-Cycle Benefits (mil. $)	$4,003.8
Net Present Value (mil. $)	$3,540.9
Benefit / Cost Ratio:	8.6
Rate of Return on Investment:	15.2%
Payback Period:	12 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$2,534.8	$985.2	$3,520.0	$176.0
Veh. Op. Cost Savings	$280.3	$75.2	$355.5	$17.8
Accident Cost Savings	$20.5	$2.3	$22.8	$1.1
Emission Cost Savings	$48.3	$57.3	$105.5	$5.3
TOTAL BENEFITS	$2,883.9	$1,119.9	$4,003.8	$200.2
Person-Hours of Time Saved			524,166,455	26,208,323

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	4,759	238	$0.2	$0.0
CO_2 Emissions Saved	2,360,489	118,024	$59.3	$3.0
NO_X Emissions Saved	5,125	256	$43.7	$2.2
PM_{10} Emissions Saved	21	1	$1.2	$0.1
$PM_{2.5}$ Emissions Saved	19	1		
SO_X Emissions Saved	23	1	$0.7	$0.0
VOC Emissions Saved	565	28	$0.3	$0.0

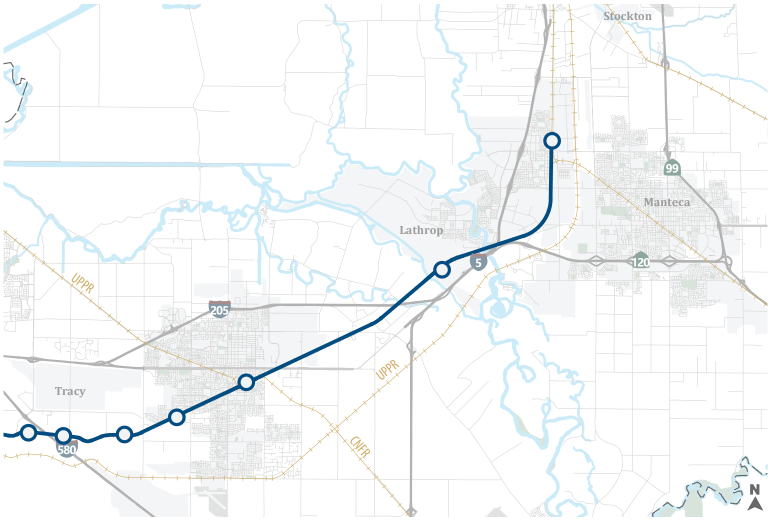
1E

PROJECT COSTS (enter costs in thousands of dollars)

Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1	$5,000	$4,000	$90,980					$99,980,000	$99,980,000
2	5,000	4,000	90,980					99,980,000	96,134,615
3	5,000	4,000	90,980					99,980,000	92,437,130
4	5,000	4,000	90,980					99,980,000	88,881,856
5	5,000	4,000	90,980					99,980,000	85,463,323
6								0	0
7								0	0
8								0	0
Project Open									
1				$5				$5,000	$4,110
2				5				5,000	3,952
3				5				5,000	3,800
4				5				5,000	3,653
5				5				5,000	3,513
6				5				5,000	3,378
7				5				5,000	3,248
8				5				5,000	3,123
9				5				5,000	3,003
10				5				5,000	2,887
11				5				5,000	2,776
12				5				5,000	2,670
13				5				5,000	2,567
14				5				5,000	2,468
15				5				5,000	2,373
16				5				5,000	2,282
17				5				5,000	2,194
18				5				5,000	2,110
19				5				5,000	2,029
20				5				5,000	1,951
Total	$25,000	$20,000	$454,900	$100	$0	$0	$0	$500,000,000	$462,955,010

SJCOG Congested Corridor Plan -
Recommended Mid-Term (2030) Project

Valley Link Construction and Stations:



Lead Agency
Tri-Valley San Joaquin Valley Regional Rail Authority

Estimated Cost ($)
$1,590 M

Regional Benefit
Increase person throughput and reduce reliance on automobile traffic

Purpose and Need

In the valley Link Project Feasibility Report (October 2019) the Project was conceived as a rail-based transit solution to bridge the gap between BART and ACE and improve connections between the greater San Francisco Bay Area and San Joaquin County. The Valley Link Project would serve 26,000 to 28,000 daily riders by 2040. This would be equal to taking up to 14,000 vehicles in each direction on the Altamont Pass and a yearly reduction of 33,000 metric tons of CO2 emissions in 2040. Headways are projected to be every 24 minutes in San Joaquin County during the AM and PM peak period and 60-minute headway during off-peak.

Regional Improvement

-25%
Congestion Reduction
Providing a reliable multi-modal option

Safety
Reduce vehicle, pedestrian and bicycle collisions

-35%
Air Quality & GHG
Decreased fuel consumption will result in 3M tons of reduced emissions

+40%
Throughput
Improving operation and efficiency over the Altamont Pass for passenger service

Economic Vitality
Increase the region's economic competitiveness for moving goods and passengers.

3.7 B/C
Cost Effectiveness
Rate of return on investment = 12.0%

SJCOG
CONGESTED CORRIDOR PLAN

Valley Link Construction and Stations

California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project		Enter data in both sections 1B & 1E	
Select project type from list		Passenger Rail	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)			2
Length of Construction Period		7	years
One- or Two-Way Data		2	enter 1 or 2
		Current	
Length of Peak Period(s) (up to 24 hrs)		8	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		F	F
Number of General Traffic Lanes		6	6
Number of HOV/HOT Lanes		0	2
HOV Restriction (2 or 3)		2	
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	35
Length (in miles)	Highway Segment	14.0	14.0
	Impacted Length	14.0	14.0

Average Daily Traffic			
	Current	170,000	
		No Build	Build
	Base (Year 1)	191,538	191,538
	Forecast (Year 20)	250,000	250,000
Average Hourly HOV/HOT Lane Traffic		4,100	4,100
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			100%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		10%	10%
Truck Speed		55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.10	1.10
	Peak	1.10	1.10
High Occupancy Vehicle (if HOV/HOT lanes)		2.10	2.10

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	800	0.31
Fatal Accidents (Fat)	5	0.002
Injury Accidents (Inj)	250	0.10
Property Damage Only (PDO) Accidents	545	0.21

Statewide Basic Average Accident Rate	No Build	Build
Rate Group		
Accident Rate (per million vehicle-miles)	0.10	0.10
Percent Fatal Accidents (Pct Fat)	0.4%	0.4%
Percent Injury Accidents (Pct Inj)	30.0%	30.0%

1D RAIL AND TRANSIT DATA

Annual Person-Trips		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Percent Trips during Peak Period		61%	
Percent New Trips from Parallel Highway			100%

Annual Vehicle-Miles		No Build	Build
	Base (Year 1)	26,271,581	23,644,423
	Forecast (Year 20)	31,675,009	28,507,508
Average Vehicles/Train (if rail project)		4	6

Reduction in Transit Accidents		
Percent Reduction (if safety project)		

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

SAN JOAQUIN COUNCIL OF GOVERNMENTS

Caltrans

SJCOG
CONGESTED CORRIDOR PLAN

Valley Link Construction and Stations
California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS
SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$1,417.9
Life-Cycle Benefits (mil. $)	$5,256.8
Net Present Value (mil. $)	$3,839.0
Benefit / Cost Ratio:	3.7
Rate of Return on Investment:	12.0%
Payback Period:	11 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$3,137.6	$1,062.0	$4,199.7	$210.0
Veh. Op. Cost Savings	$335.2	$85.0	$420.2	$21.0
Accident Cost Savings	$38.0	$2.1	$40.1	$2.0
Emission Cost Savings	$535.4	$61.4	$596.8	$29.8
TOTAL BENEFITS	$4,046.2	$1,210.6	$5,256.8	$262.8
Person-Hours of Time Saved			644,557,469	32,227,873

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	8,972	449	$0.4	$0.0
CO_2 Emissions Saved	2,938,258	146,913	$73.6	$3.7
NO_X Emissions Saved	28,751	1,438	$293.6	$14.7
PM_{10} Emissions Saved	2,659	133	$227.0	$11.3
$PM_{2.5}$ Emissions Saved	27	1		
SO_X Emissions Saved	28	1	$0.9	$0.0
VOC Emissions Saved	1,983	99	$1.3	$0.1

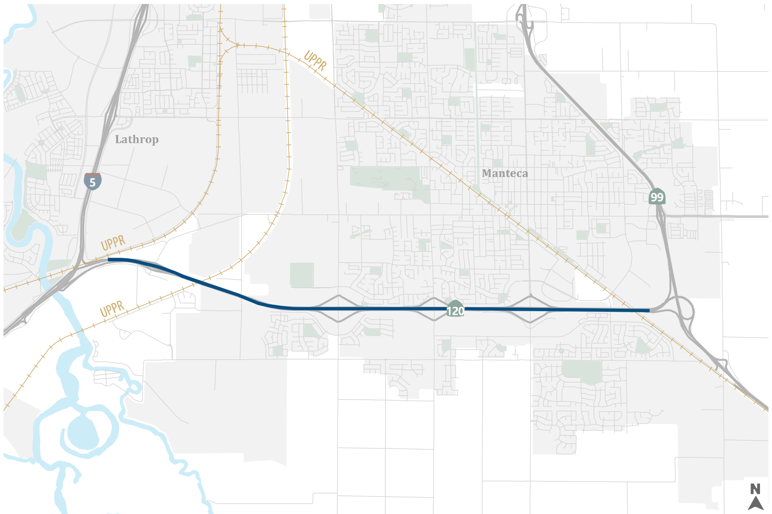
1E

PROJECT COSTS (enter costs in thousands of dollars)

Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1	$8,000	$10,000	$209,143					$227,142,857	$227,142,857
2	8,000	$10,000	$209,143					227,142,857	218,406,593
3	8,000	$10,000	$209,143					227,142,857	210,006,340
4	8,000	$10,000	$209,143					227,142,857	201,929,173
5	8,000	$10,000	$209,143					227,142,857	194,162,666
6	8,000	$10,000	$209,143					227,142,857	186,694,871
7	8,000	$10,000	$209,143					227,142,857	179,514,299
8								0	0
Project Open									
1								$0	$0
2								0	0
3								0	0
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
9								0	0
10								0	0
11								0	0
12								0	0
13								0	0
14								0	0
15								0	0
16								0	0
17								0	0
18								0	0
19								0	0
20								0	0
Total	$56,000	$70,000	$1,464,000	$0	$0	$0	$0	$1,590,000,000	$1,417,856,801

SJCOG CONGESTED CORRIDOR PLAN

SR 120 High Occupancy Vehicle Lane (Carpool) or Express Lane from I-5 to SR 99:



Lead Agency
SJCOG/Caltrans

Estimated Cost ($)
$93.8 M

Regional Benefit
Significantly reduce passenger hours of delay (35%) and increase passenger throughput (30%). Improve saftey and air quality

Purpose and Need

The completion of the SR 120 / SR 99 Phase 1A (funded) and Phase 1B (Recommended Short-Term Project) will necessitate the need to construct the SR 120 HOV/Transit, Express Lane between Interstate 5 and State Route 99. The construction of the HOV/Transit/Express Lane on westbound SR 120 will reduce passenger hours of delay by up to 35% from State Route 99 and Interstate 5 during the morning peak period.

Regional Improvement

-35%
Congestion Reduction
Elimination of bottleneck connecting SR 99 to I-5

Safety
Reduce vehicle and truck collisions

-20%
Air Quality & GHG
Decreased fuel consumption will result in 615,000 tons of reduced emissions

+30%
Throughput
Improving operation and movement of passenger cars and trucks

Economic Vitality
Increase the region's economic competitiveness for jobs and housing

19.0 B/C
Cost Effectiveness
Rate of return on investment = 45.9%

SAN JOAQUIN COUNCIL OF GOVERNMENTS

Caltrans

SJCOG CONGESTED CORRIDOR PLAN

SR 120 High Occupancy Vehicle Lane (Carpool) or Express Lane from I-5 to SR 99

California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Include toll payers as HOVs & check AVOs	
Select project type from list	HOT Lane Addition	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)	2	
Length of Construction Period	3	years
One- or Two-Way Data	2	enter 1 or 2
	Current	
Length of Peak Period(s) (up to 24 hrs)	8	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		F	F
Number of General Traffic Lanes		3	3
Number of HOV/HOT Lanes		0	2
HOV Restriction (2 or 3)		2	
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	35
Length (in miles)	Highway Segment	6.0	6.0
	Impacted Length	6.0	6.0

Average Daily Traffic			
	Current	84,000	
		No Build	Build
	Base (Year 1)	94,364	94,364
	Forecast (Year 20)	160,000	160,000
Average Hourly HOV/HOT Lane Traffic		2,600	2,600
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			100%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		15%	15%
Truck Speed		55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.20	1.20
	Peak	1.20	1.20
High Occupancy Vehicle (if HOV/HOT lanes)		2.10	2.10

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	400	0.72
Fatal Accidents (Fat)	6	0.011
Injury Accidents (Inj)	200	0.36
Property Damage Only (PDO) Accidents	194	0.35

Statewide Basic Average Accident Rate	No Build	Build
Rate Group		
Accident Rate (per million vehicle-miles)	0.26	0.26
Percent Fatal Accidents (Pct Fat)	0.4%	0.4%
Percent Injury Accidents (Pct Inj)	30.6%	30.6%

1D RAIL AND TRANSIT DATA

Annual Person-Trips	No Build	Build
Base (Year 1)		
Forecast (Year 20)		
Percent Trips during Peak Period	61%	
Percent New Trips from Parallel Highway		100%

Annual Vehicle-Miles	No Build	Build
Base (Year 1)		
Forecast (Year 20)		
Average Vehicles/Train (if rail project)		

Reduction in Transit Accidents	
Percent Reduction (if safety project)	

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

San Joaquin Council of Governments

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SJCOG
CONGESTED CORRIDOR PLAN

SR 120 High Occupancy Vehicle Lane (Carpool) or Express Lane from I-5 to SR 99

California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$90.2
Life-Cycle Benefits (mil. $)	$1,709.5
Net Present Value (mil. $)	$1,619.3
Benefit / Cost Ratio:	19.0
Rate of Return on Investment:	45.9%
Payback Period:	2 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$1,343.1	$221.8	$1,565.0	$78.2
Veh. Op. Cost Savings	$91.7	$16.9	$108.6	$5.4
Accident Cost Savings	$7.2	$1.3	$8.5	$0.4
Emission Cost Savings	$16.5	$10.9	$27.4	$1.4
TOTAL BENEFITS	$1,458.6	$250.9	$1,709.5	$85.5
Person-Hours of Time Saved			190,276,223	9,513,811

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

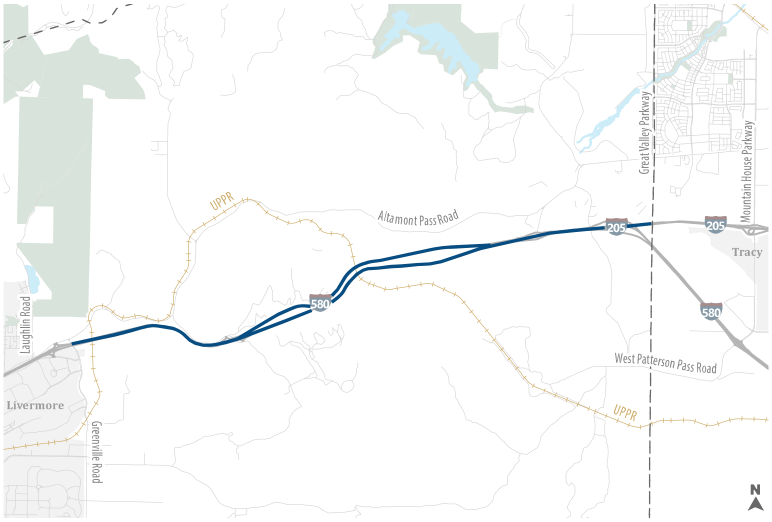
EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	1,457	73	$0.1	$0.0
CO_2 Emissions Saved	614,034	30,702	$17.5	$0.9
NO_X Emissions Saved	883	44	$8.9	$0.4
PM_{10} Emissions Saved	6	0	$0.5	$0.0
$PM_{2.5}$ Emissions Saved	5	0		
SO_X Emissions Saved	6	0	$0.3	$0.0
VOC Emissions Saved	157	8	$0.1	$0.0

1E

PROJECT COSTS (enter costs in thousands of dollars)

Year	(1) Direct Project Costs – Initial Costs: Project Support	(2) Initial Costs: R / W	(3) Initial Costs: Construction	(4) Subsequent Costs: Maint./Op.	(5) Subsequent Costs: Rehab.	(6) Mitigation	(7) Transit Agency Cost Savings	Total Costs (in dollars): Constant Dollars	Total Costs (in dollars): Present Value
Construction Period									
1	$5,000	$4,000	$22,233					$31,233,333	$31,233,333
2	5,000	4,000	22,233					31,233,333	30,032,051
3	5,000	4,000	22,233					31,233,333	28,876,972
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
Project Open									
1				$5				$5,000	$4,445
2				5				5,000	4,274
3				5				5,000	4,110
4				5				5,000	3,952
5				5				5,000	3,800
6				5				5,000	3,653
7				5				5,000	3,513
8				5				5,000	3,378
9				5				5,000	3,248
10				5				5,000	3,123
11				5				5,000	3,003
12				5				5,000	2,887
13				5				5,000	2,776
14				5				5,000	2,670
15				5				5,000	2,567
16				5				5,000	2,468
17				5				5,000	2,373
18				5				5,000	2,282
19				5				5,000	2,194
20				5				5,000	2,110
Total	$15,000	$12,000	$66,700	$100	$0	$0	$0	$93,800,000	$90,205,182

I-580 High Occupancy Vehicle Lane (Carpool) or Express Lane from I-580/Greenville Road to County Line:



Lead Agency
ACTC/Caltrans

Estimated Cost ($)
$668.0 M

Regional Benefit
Significantly reduce passenger hours of delay (50%) and increase in throughput (45%). Improve safety and air quality

Purpose and Need

The construction of the HOV/Transit/Express Lane on westbound I-205 from the County Line to I-5 will necessitate the need for extending the travel lane over the Altamont Pass, into Alameda County to connect with the existing HOV/Transit/Express Lane. Passenger hours of delay would be reduced by up to 50% from the Alameda / San Joaquin County Line to the I-580 / Greenville Road interchange during both morning and evening peak periods. This would result in a 45% increase in passenger throughput during both the morning and evening peak periods.

Regional Improvement

-50%
Congestion Reduction
Elimination of bottleneck connecting San Joaquin Valley to Bay Area

Safety
Reduce vehicle and truck collisions

-35%
Air Quality & GHG
Decreased fuel consumption will result in 3.3M tons of reduced emissions

+45%
Throughput
Improving operation and movement of passenger cars and trucks

Economic Vitality
Increase the region's economic competitiveness for moving people and freight

6.7 B/C
Cost Effectiveness
Rate of return on investment = 13.6%

San Joaquin Council of Governments

Caltrans

SJCOG
CONGESTED CORRIDOR PLAN

I-580 High Occupancy Vehicle Lane (Carpool) or Express Lane from I-580/Greenville Road to County Line

California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Include toll payers as HOVs & check AVOs	
Select project type from list	HOT Lane Addition	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)	2	
Length of Construction Period	5	years
One- or Two-Way Data	2	enter 1 or 2
	Current	
Length of Peak Period(s) (up to 24 hrs)	8	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		F	F
Number of General Traffic Lanes		7	7
Number of HOV/HOT Lanes		0	2
HOV Restriction (2 or 3)		2	
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	35
Length (in miles)	Highway Segment	14.0	14.0
	Impacted Length	14.0	14.0

Average Daily Traffic			
	Current	190,000	
		No Build	Build
	Base (Year 1)	208,750	186,384
	Forecast (Year 20)	280,000	250,000
Average Hourly HOV/HOT Lane Traffic		4,100	4,100
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			75%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		10%	10%
Truck Speed		55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.10	1.10
	Peak	1.10	1.10
High Occupancy Vehicle (if HOV/HOT lanes)		2.10	2.10

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	1000	0.34
Fatal Accidents (Fat)	10	0.003
Injury Accidents (Inj)	500	0.17
Property Damage Only (PDO) Accidents	490	0.17

Statewide Basic Average Accident Rate	No Build	Build
Rate Group		
Accident Rate (per million vehicle-miles)	0.10	0.10
Percent Fatal Accidents (Pct Fat)	0.4%	0.4%
Percent Injury Accidents (Pct Inj)	30.0%	30.0%

1D RAIL AND TRANSIT DATA

Annual Person-Trips	No Build	Build
Base (Year 1)		
Forecast (Year 20)		
Percent Trips during Peak Period	61%	
Percent New Trips from Parallel Highway		100%

Annual Vehicle-Miles	No Build	Build
Base (Year 1)		
Forecast (Year 20)		
Average Vehicles/Train (if rail project)		

Reduction in Transit Accidents	
Percent Reduction (if safety project)	

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

SAN JOAQUIN COUNCIL OF GOVERNMENTS

Caltrans

SJCOG
CONGESTED CORRIDOR PLAN

I-580 High Occupancy Vehicle Lane (Carpool) or Express Lane from I-580/Greenville Road to County Line

California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$618.5
Life-Cycle Benefits (mil. $)	$4,140.8
Net Present Value (mil. $)	$3,522.3
Benefit / Cost Ratio:	6.7
Rate of Return on Investment:	13.6%
Payback Period:	13 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$1,995.8	$956.0	$2,951.8	$147.6
Veh. Op. Cost Savings	$780.6	$156.3	$936.9	$46.8
Accident Cost Savings	$95.5	$10.6	$106.1	$5.3
Emission Cost Savings	$64.2	$81.8	$145.9	$7.3
TOTAL BENEFITS	$2,936.1	$1,204.7	$4,140.8	$207.0
Person-Hours of Time Saved			464,789,312	23,239,466

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

	Tons		Value (mil. $)	
EMISSIONS REDUCTION	Total Over 20 Years	Average Annual	Total Over 20 Years	Average Annual
CO Emissions Saved	7,682	384	$0.3	$0.0
CO_2 Emissions Saved	3,337,145	166,857	$85.3	$4.3
NO_X Emissions Saved	6,364	318	$56.8	$2.8
PM_{10} Emissions Saved	28	1	$1.9	$0.1
$PM_{2.5}$ Emissions Saved	26	1		
SO_X Emissions Saved	34	2	$1.2	$0.1
VOC Emissions Saved	670	33	$0.4	$0.0

1E

PROJECT COSTS (enter costs in thousands of dollars)

Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1	$4,980	$4,000	$124,600					$133,580,000	$133,580,000
2	4,980	4,000	124,600					133,580,000	128,442,308
3	4,980	4,000	124,600					133,580,000	123,502,219
4	4,980	4,000	124,600					133,580,000	118,752,134
5	4,980	4,000	124,600					133,580,000	114,184,744
6								0	0
7								0	0
8								0	0
Project Open									
1				$5				$5,000	$4,110
2				5				5,000	3,952
3				5				5,000	3,800
4				5				5,000	3,653
5				5				5,000	3,513
6				5				5,000	3,378
7				5				5,000	3,248
8				5				5,000	3,123
9				5				5,000	3,003
10				5				5,000	2,887
11				5				5,000	2,776
12				5				5,000	2,670
13				5				5,000	2,567
14				5				5,000	2,468
15				5				5,000	2,373
16				5				5,000	2,282
17				5				5,000	2,194
18				5				5,000	2,110
19				5				5,000	2,029
20				5				5,000	1,951
Total	$24,900	$20,000	$623,000	$100	$0	$0	$0	$668,000,000	$618,519,489

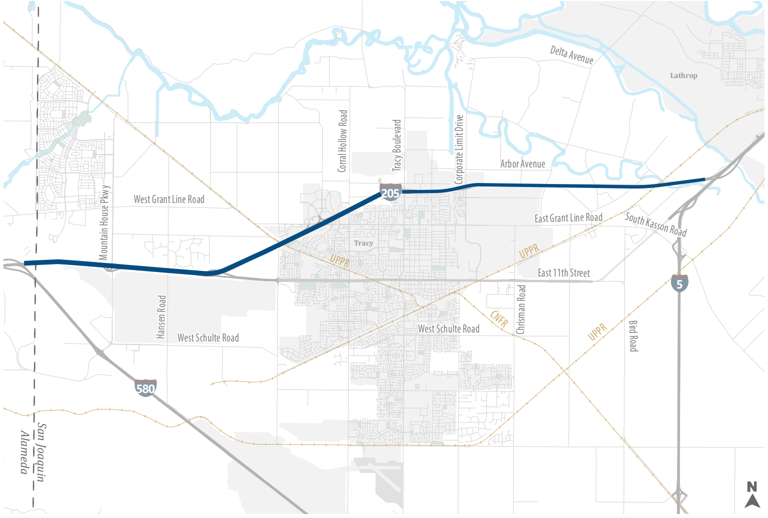
SAN JOAQUIN COUNCIL OF GOVERNMENTS

Caltrans

SJCOG Congested Corridor Plan -
Recommended Long-Term (2035) Project

SJCOG
CONGESTED CORRIDOR PLAN

Fixed Guideway Concept on I-580/I-205 from Grant Line Road to Paradise Cut:



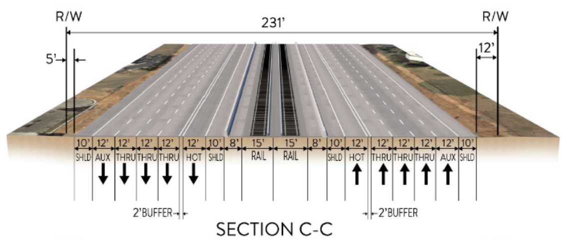
Lead Agency
SJCOG/Caltrans

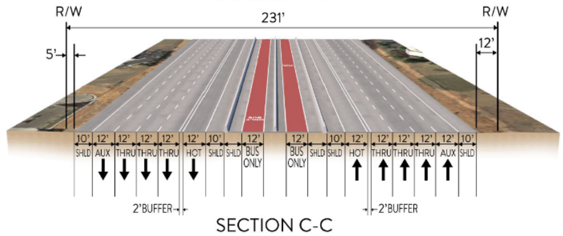
Estimated Cost ($)
$1,135.0 M

Regional Benefit
Reduce congestion on I-205 and parallel City of Tracy, Mountain House, and San Joaquin County local roadways

Purpose and Need

The Fixed Guideway Concept would be constructed in the center median of I-205 / I-580 from the Grant Line Road interchange to just east of the new I-205 / Chrisman Road interchange. This Fixed Guideway if implemented as a passenger rail system could provide a viable alignment option to the proposed Valley Link and existing ACE alignments, with stations located at Mountain House and Tracy. The fixed guideway would tie in with the remaining segments/ phases of the Valley Link Project west of Grant Line Road and east of the Paradise Cut.





Regional Improvement

-25%
Congestion Reduction
Providing a reliable multi-modal option

Safety
Reduce vehicle, pedestrian and bicycle collisions

-35%
Air Quality & GHG
Decreased fuel consumption will result in 3M tons of reduced emissions

+40%
Throughput
Improving operation and efficiency of passenger service over the Altamont Pass

Economic Vitality
Increase the region's economic competitiveness for moving goods and passengers.

5.2 B/C
Cost Effectiveness
Rate of return on investment = 14.2%

SJCOG
CONGESTED CORRIDOR PLAN

Fixed Guideway Concept on I-580/I-205 from Grant Line Road to Paradise Cut

California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Enter data in both sections 1B & 1E	
Select project type from list	Passenger Rail	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)	2	
Length of Construction Period	7	years
One- or Two-Way Data	2	enter 1 or 2
	Current	
Length of Peak Period(s) (up to 24 hrs)	8	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		F	F
Number of General Traffic Lanes		6	6
Number of HOV/HOT Lanes		0	2
HOV Restriction (2 or 3)		2	
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	35
Length (in miles)	Highway Segment	14.0	14.0
	Impacted Length	14.0	14.0

Average Daily Traffic			
	Current	170,000	
		No Build	Build
	Base (Year 1)	191,538	191,538
	Forecast (Year 20)	250,000	250,000
Average Hourly HOV/HOT Lane Traffic		4,100	4,100
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			100%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		10%	10%
Truck Speed		55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.10	1.10
	Peak	1.10	1.10
High Occupancy Vehicle (if HOV/HOT lanes)		2.10	2.10

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	800	0.31
Fatal Accidents (Fat)	5	0.002
Injury Accidents (Inj)	250	0.10
Property Damage Only (PDO) Accidents	545	0.21

Statewide Basic Average Accident Rate	No Build	Build
Rate Group		
Accident Rate (per million vehicle-miles)	0.10	0.10
Percent Fatal Accidents (Pct Fat)	0.4%	0.4%
Percent Injury Accidents (Pct Inj)	30.0%	30.0%

1D RAIL AND TRANSIT DATA

Annual Person-Trips		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Percent Trips during Peak Period		61%	
Percent New Trips from Parallel Highway			100%

Annual Vehicle-Miles		No Build	Build
	Base (Year 1)	26,271,581	23,644,423
	Forecast (Year 20)	31,675,009	28,507,508
Average Vehicles/Train (if rail project)		4	6

Reduction in Transit Accidents	
Percent Reduction (if safety project)	

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

SAN JOAQUIN COUNCIL OF GOVERNMENTS

Caltrans

SJCOG CONGESTED CORRIDOR PLAN

Fixed Guideway Concept on I-580/I-205 from Grant Line Road to Paradise Cut

California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$1,012.1
Life-Cycle Benefits (mil. $)	$5,256.8
Net Present Value (mil. $)	$4,244.7
Benefit / Cost Ratio:	5.2
Rate of Return on Investment:	14.2%
Payback Period:	10 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$3,137.6	$1,062.0	$4,199.7	$210.0
Veh. Op. Cost Savings	$335.2	$85.0	$420.2	$21.0
Accident Cost Savings	$38.0	$2.1	$40.1	$2.0
Emission Cost Savings	$535.4	$61.4	$596.8	$29.8
TOTAL BENEFITS	$4,046.2	$1,210.6	$5,256.8	$262.8
Person-Hours of Time Saved			644,557,469	32,227,873

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	8,972	449	$0.4	$0.0
CO_2 Emissions Saved	2,938,258	146,913	$73.6	$3.7
NO_X Emissions Saved	28,751	1,438	$293.6	$14.7
PM_{10} Emissions Saved	2,659	133	$227.0	$11.3
$PM_{2.5}$ Emissions Saved	27	1		
SO_X Emissions Saved	28	1	$0.9	$0.0
VOC Emissions Saved	1,983	99	$1.3	$0.1

1E

PROJECT COSTS (enter costs in thousands of dollars)

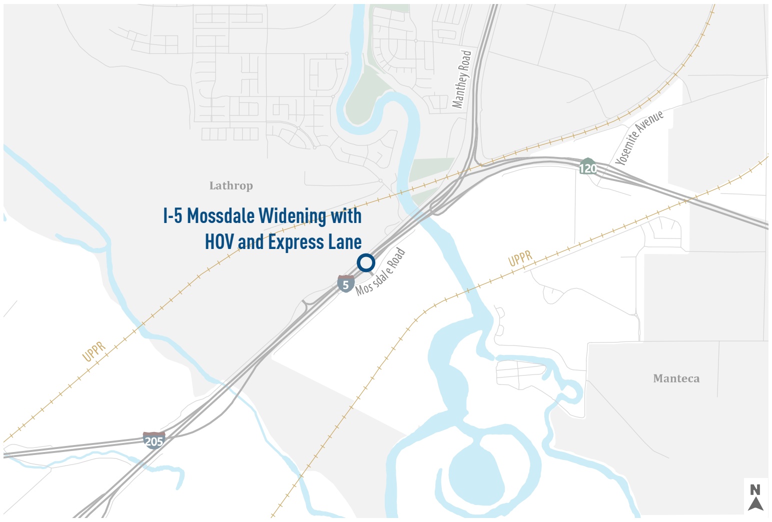
Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1	$8,000	$10,000	$144,143					$162,142,857	$162,142,857
2	8,000	$10,000	$144,143					162,142,857	155,906,593
3	8,000	$10,000	$144,143					162,142,857	149,910,186
4	8,000	$10,000	$144,143					162,142,857	144,144,410
5	8,000	$10,000	$144,143					162,142,857	138,600,394
6	8,000	$10,000	$144,143					162,142,857	133,269,610
7	8,000	$10,000	$144,143					162,142,857	128,143,855
8								0	0
Project Open									
1								$0	$0
2								0	0
3								0	0
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
9								0	0
10								0	0
11								0	0
12								0	0
13								0	0
14								0	0
15								0	0
16								0	0
17								0	0
18								0	0
19								0	0
20								0	0
Total	$56,000	$70,000	$1,009,000	$0	$0	$0	$0	$1,135,000,000	$1,012,117,905

SAN JOAQUIN COUNCIL OF GOVERNMENTS

Caltrans

SJCOG
CONGESTED CORRIDOR PLAN

I-5 Mossdale Widening with High Occupancy Vehicle Lane (Carpool) or Express Lane:



Lead Agency
SJCOG/Caltrans

Estimated Cost ($)
$308.0 M

Regional Benefit
Reduce congestion on I-5 between I-205 and SR 120 with direct HOV Ramps

Purpose and Need

The completion of the SR 120 HOV/Transit/Express Lane between Interstate 5 and State Route 99 will necessitate the need toconstruct the I-5 Mossdale Widening with HOV/Transit/Express Lane between I-205 and SR 120. With this long-term extension project, a continuous HOV/Transit/Express Lane would connect San Joaquin County at Interstate 99 to the entire HOV/Transit/Express Lane system in the San Francisco Bay Area. Passenger hours of delay would be reduced by up to 57% from the SR 99 / SR 120 freeway to freeway interchange to the I-580 / Greenville Road interchange during both morning and evening peak periods. In addition, the mode split would increase as carpool and transit passengers would have a dedicated travel lane for approximately 30 miles. This would result in a 47% increase in passenger throughput during both the morning and evening peak periods.

Regional Improvement

-15%
Congestion Reduction
Elimination of congestion on I-5 connecting I-205 to SR 120

Safety
Reduce vehicle and truck collisions

-10%
Air Quality & GHG
Decreased fuel consumption will result in 157,00 tons of reduced emissions

+15%
Throughput
Improving operation and movement of HOV/express lane passengers

Economic Vitality
Increase the region's economic competitiveness for moving HOV/express lane passengers

1.5 B/C
Cost Effectiveness
Rate of return on investment = 7.2%

San Joaquin Council of Governments

Caltrans

SJCOG CONGESTED CORRIDOR PLAN

I-5 Mossdale Widening with High Occupancy Vehicle Lane (Carpool) or Express Lane

California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Include toll payers as HOVs & check AVOs	
Select project type from list	HOT Lane Addition	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)	2	
Length of Construction Period	3	years
One- or Two-Way Data	2	enter 1 or 2
	Current	
Length of Peak Period(s) (up to 24 hrs)	4	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		F	F
Number of General Traffic Lanes		6	6
Number of HOV/HOT Lanes		0	2
HOV Restriction (2 or 3)		2	
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	35
Length (in miles)	Highway Segment	2.5	2.5
	Impacted Length	2.5	2.5

Average Daily Traffic			
	Current	157,000	
		No Build	Build
	Base (Year 1)	169,000	169,000
	Forecast (Year 20)	245,000	245,000
Average Hourly HOV/HOT Lane Traffic		2,600	2,600
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			100%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		15%	15%
Truck Speed		55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.20	1.20
	Peak	1.20	1.20
High Occupancy Vehicle (if HOV/HOT lanes)		2.10	2.10

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	150	0.35
Fatal Accidents (Fat)	2	0.005
Injury Accidents (Inj)	50	0.12
Property Damage Only (PDO) Accidents	98	0.23

Statewide Basic Average Accident Rate	No Build	Build
Rate Group		
Accident Rate (per million vehicle-miles)	0.26	0.26
Percent Fatal Accidents (Pct Fat)	0.4%	0.4%
Percent Injury Accidents (Pct Inj)	30.6%	30.6%

1D RAIL AND TRANSIT DATA

Annual Person-Trips		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Percent Trips during Peak Period		33%	
Percent New Trips from Parallel Highway			100%

Annual Vehicle-Miles		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Average Vehicles/Train (if rail project)			

Reduction in Transit Accidents	
Percent Reduction (if safety project)	

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

SAN JOAQUIN COUNCIL OF GOVERNMENTS

Caltrans

SJCOG
CONGESTED CORRIDOR PLAN

I-5 Mossdale Widening with High Occupancy Vehicle Lane (Carpool) or Express Lane

California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$296.3
Life-Cycle Benefits (mil. $)	$447.5
Net Present Value (mil. $)	$151.2
Benefit / Cost Ratio:	1.5
Rate of Return on Investment:	7.2%
Payback Period:	14 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$336.4	$72.4	$408.8	$20.4
Veh. Op. Cost Savings	$22.4	$4.5	$26.9	$1.3
Accident Cost Savings	$3.8	$0.7	$4.5	$0.2
Emission Cost Savings	$3.9	$3.5	$7.4	$0.4
TOTAL BENEFITS	$366.5	$81.0	$447.5	$22.4
Person-Hours of Time Saved			49,910,382	2,495,519

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	382	19	$0.0	$0.0
CO_2 Emissions Saved	156,792	7,840	$4.4	$0.2
NO_X Emissions Saved	280	14	$2.8	$0.1
PM_{10} Emissions Saved	1	0	$0.1	$0.0
$PM_{2.5}$ Emissions Saved	1	0		
SO_X Emissions Saved	2	0	$0.1	$0.0
VOC Emissions Saved	41	2	$0.0	$0.0

1E

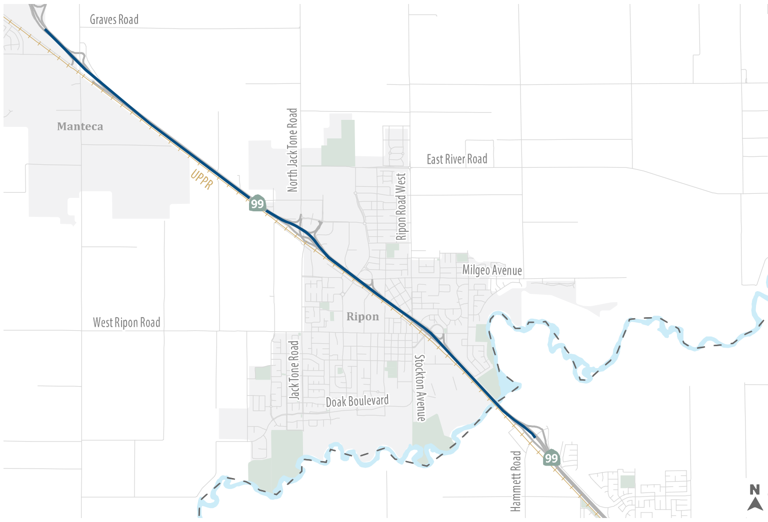
PROJECT COSTS (enter costs in thousands of dollars)

Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1	$5,000	$4,000	$93,633					$102,633,333	$102,633,333
2	5,000	4,000	93,633					102,633,333	98,685,897
3	5,000	4,000	93,633					102,633,333	94,890,286
4								0	0
5								0	0
6								0	0
7								0	0
8								0	0
Project Open									
1				$5				$5,000	$4,445
2			Cal-BC	5				5,000	4,274
3				5				5,000	4,110
4				5				5,000	3,952
5				5				5,000	3,800
6				5				5,000	3,653
7				5				5,000	3,513
8				5				5,000	3,378
9				5				5,000	3,248
10				5				5,000	3,123
11				5				5,000	3,003
12				5				5,000	2,887
13				5				5,000	2,776
14				5				5,000	2,670
15				5				5,000	2,567
16				5				5,000	2,468
17				5				5,000	2,373
18				5				5,000	2,282
19				5				5,000	2,194
20				5				5,000	2,110
Total	$15,000	$12,000	$280,900	$100	$0	$0	$0	$308,000,000	$296,272,342

SJCOG Congested Corridor Plan -
Recommended Long-Term (2035) Project

SJCOG
CONGESTED CORRIDOR PLAN

SR 99 Widening with High Occupancy Vehicle Lane (Carpool) or Express Lane:



Lead Agency
SJCOG/Caltrans

Estimated Cost ($)
$563.5 M

Regional Benefit
Reduce congestion on SR 99 between SR 120 and the Hammett Road Interchange

Purpose and Need

With this long-term extension project, a continuous HOV/Transit/Express Lane would connect Stanislaus County and San Joaquin County to the entire Bay Area HOV/Transit/Express Lane system in the San Francisco Bay Area. Passenger hours of delay would be reduced by up to 65% from the SR 99 / Hammatt Road interchange to the I-580 / Greenville Road interchange during both morning and evening peak periods.

Regional Improvement

-35%
Congestion Reduction
Elimination of bottleneck connecting San Joaquin and Stanislaus County

Safety
Reduce vehicle and truck collisions

-10%
Air Quality & GHG
Decreased fuel consumption will result in 166,000 tons of reduced emissions

+30%
Throughput
Improving operation and movement of passenger cars and trucks

Economic Vitality
Increase the region's economic competitiveness for moving goods and passengers.

1.4 B/C
Cost Effectiveness
Rate of return on investment = 6.2%

SAN JOAQUIN COUNCIL OF GOVERNMENTS

Caltrans

SJCOG
CONGESTED CORRIDOR PLAN

SR 99 Widening with High Occupancy Vehicle Lane (Carpool) or Express Lane

California Life-Cycle Benefit/Cost Analysis Model:

1A PROJECT DATA

Type of Project	Include toll payers as HOVs & check AVOs	
Select project type from list	HOT Lane Addition	
Project Location (enter 1 for So. Cal., 2 for No. Cal., or 3 for rural)	2	
Length of Construction Period	4	years
One- or Two-Way Data	2	enter 1 or 2
	Current	
Length of Peak Period(s) (up to 24 hrs)	8	hours

1B HIGHWAY DESIGN AND TRAFFIC DATA

Highway Design		No Build	Build
Roadway Type (Fwy, Exp, Conv Hwy)		F	F
Number of General Traffic Lanes		6	6
Number of HOV/HOT Lanes		0	2
HOV Restriction (2 or 3)		2	
Exclusive ROW for Buses (y/n)		N	
Highway Free-Flow Speed		65	65
Ramp Design Speed (if aux. lane/off-ramp proj.)		35	45
Length (in miles)	Highway Segment	6.0	6.0
	Impacted Length	6.0	6.0

Average Daily Traffic			
	Current	118,000	
		No Build	Build
	Base (Year 1)	132,261	132,261
	Forecast (Year 20)	200,000	200,000
Average Hourly HOV/HOT Lane Traffic		2,900	2,900
Percent of Induced Trips in HOV (if HOT or 2-to-3 conv.)			50%
Percent Traffic in Weave			0.0%
Percent Trucks (include RVs, if applicable)		15%	15%
Truck Speed		55	

On-Ramp Volume	Peak	Non-Peak
Hourly Ramp Volume (if aux. lane/on-ramp proj.)	0	0
Metering Strategy (1, 2, 3, or D, if on-ramp proj.)		

Queue Formation (if queuing or grade crossing project)	Year 1	Year 20
Arrival Rate (in vehicles per hour)	0	0
Departure Rate (in vehicles per hour)	0	0

Pavement Condition (if pavement project)		No Build	Build
IRI (inches/mile)	Base (Year 1)		
	Forecast (Year 20)		

Average Vehicle Occupancy (AVO)		No Build	Build
General Traffic	Non-Peak	1.39	1.39
	Peak	1.15	1.15
High Occupancy Vehicle (if HOV/HOT lanes)		2.15	2.15

1C HIGHWAY ACCIDENT DATA

Actual 3-Year Accident Data (from Table B)	Count (No.)	Rate
Total Accidents (Tot)	200	0.26
Fatal Accidents (Fat)	8	0.010
Injury Accidents (Inj)	100	0.13
Property Damage Only (PDO) Accidents	92	0.12

Statewide Basic Average Accident Rate	No Build	Build
Rate Group	1.00	1.00
Accident Rate (per million vehicle-miles)	1.70	1.50
Percent Fatal Accidents (Pct Fat)	2.0%	1.0%
Percent Injury Accidents (Pct Inj)	98.0%	99.0%

1D RAIL AND TRANSIT DATA

Annual Person-Trips		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Percent Trips during Peak Period		61%	
Percent New Trips from Parallel Highway			100%

Annual Vehicle-Miles		No Build	Build
	Base (Year 1)		
	Forecast (Year 20)		
Average Vehicles/Train (if rail project)			

Reduction in Transit Accidents		
Percent Reduction (if safety project)		

Average Transit Travel Time		No Build	Build
In-Vehicle	Non-Peak (in minutes)		0.0
	Peak (in minutes)		0.0
Out-of-Vehicle	Non-Peak (in minutes)	0.0	0.0
	Peak (in minutes)	0.0	0.0

Highway Grade Crossing	Current	Year 1	Year 20
Annual Number of Trains		0	
Avg. Gate Down Time (in min.)		0.0	

Transit Agency Costs (if TMS project)	No Build	Build
Annual Capital Expenditure		$0
Annual Ops. and Maintenance Expenditure		$0

SAN JOAQUIN COUNCIL OF GOVERNMENTS

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CONGESTED CORRIDOR PLAN

SR 99 Widening with High Occupancy Vehicle Lane (Carpool) or Express Lane

California Life-Cycle Benefit/Cost Analysis Model:

3

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$531.5
Life-Cycle Benefits (mil. $)	$724.4
Net Present Value (mil. $)	$192.9
Benefit / Cost Ratio:	1.4
Rate of Return on Investment:	6.2%
Payback Period:	15 years

ITEMIZED BENEFITS (mil. $)	Passenger Benefits	Freight Benefits	Total Over 20 Years	Average Annual
Travel Time Savings	$321.7	$111.8	$433.6	$21.7
Veh. Op. Cost Savings	$13.4	-$1.6	$11.8	$0.6
Accident Cost Savings	$230.1	$40.6	$270.7	$13.5
Emission Cost Savings	$2.4	$6.0	$8.4	$0.4
TOTAL BENEFITS	$567.6	$156.8	$724.4	$36.2
Person-Hours of Time Saved			57,005,379	2,850,269

Should benefit-cost results include:

1) Induced Travel? (y/n)	Y	Default = Y
2) Vehicle Operating Costs? (y/n)	Y	Default = Y
3) Accident Costs? (y/n)	Y	Default = Y
4) Vehicle Emissions? (y/n) includes value for CO_2e	Y	Default = Y

EMISSIONS REDUCTION	Tons: Total Over 20 Years	Tons: Average Annual	Value (mil. $): Total Over 20 Years	Value (mil. $): Average Annual
CO Emissions Saved	654	33	$0.0	$0.0
CO_2 Emissions Saved	165,085	8,254	$4.1	$0.2
NO_X Emissions Saved	477	24	$4.2	$0.2
PM_{10} Emissions Saved	1	0	-$0.0	-$0.0
$PM_{2.5}$ Emissions Saved	0	0		
SO_X Emissions Saved	2	0	$0.0	$0.0
VOC Emissions Saved	50	2	$0.0	$0.0

1E

PROJECT COSTS (enter costs in thousands of dollars)

Col. no.	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
	DIRECT PROJECT COSTS						Transit Agency Cost Savings	TOTAL COSTS (in dollars)	
	INITIAL COSTS			SUBSEQUENT COSTS					
Year	Project Support	R / W	Construction	Maint./ Op.	Rehab.	Mitigation		Constant Dollars	Present Value
Construction Period									
1	$4,980	$4,000	$131,654					$140,634,000	$140,634,000
2	4,980	4,000	131,654					140,634,000	135,225,000
3	4,980	4,000	131,654					140,634,000	130,024,038
4	4,980	4,000	131,654					140,634,000	125,023,114
5								0	0
6								0	0
7								0	0
8								0	0
Project Open									
1				$25				$25,000	$21,370
2				26				26,000	21,370
3				27				27,000	21,338
4				28				28,000	21,278
5				29				29,000	21,190
6				100				100,000	70,259
7				31				31,000	20,942
8				32				32,000	20,787
9				33				33,000	20,612
10				34				34,000	20,420
11				35				35,000	20,212
12				36				36,000	19,990
13				150				150,000	80,086
14				40				40,000	20,535
15				41				41,000	20,239
16				42				42,000	19,935
17				120				120,000	54,766
18				44				44,000	19,309
19				45				45,000	18,988
20				46				46,000	18,663
Total	$19,920	$16,000	$526,616	$964	$0	$0	$0	$563,500,000	$531,458,440

APPENDIX C:

SOLUTIONS FOR CONGESTED CORRIDORS PROGRAM GUIDELINES

AND

CALIFORNIA LIFE-CYCLE / COST BENEFIT ANALYSIS

Appendix C – Solutions for Congested Corridors Program Guidelines and California Life-Cycle / Cost Benefit Analysis

This Methodology Memorandum presents the SB1 Solutions for Congested Corridors Program (SCCP) Guidelines that were adopted by the California Transportation Commission (CTC) on January 29, 2020 (Resolution G-20-26) that were comprised of the following nine (9) key quantitative and qualitative metrics:

- Congestion Reduction;
- Throughput;
- System Reliability;
- Safety;
- Economic Vitality;
- Air Quality / GHG;
- Accessibility;
- Cost Effectiveness; and
- Efficient Land Use;

It should be noted that in order to equally evaluate each of the multi-modal projects, each project was analyzed independently compared to Year 2042 No Project Conditions and a numeric scoring of High Benefit (5), Medium Benefit (3) and Low Benefit (1) was used to determine the regional benefits of the project to the entire 28 miles I-205. I-5. SR 120, SR 99 study area.

In addition to the SCCP Guidelines, a detailed discussion of the data requirements and input used in the California Life-Cycle Benefit / Cost Analysis Model, and the resulting Investment Analysis and Summary Results is presented in the Methodology Memorandum.

Solutions for Congested Corridors Program

The primary objective of the Congested Corridors Program is to fund projects designed to reduce congestion in highly traveled and highly congested corridors through performance improvements that balance transportation improvements, community impacts, and that provide environmental benefits.

Primary Evaluation Criteria – Reducing Congestion

The primary evaluation criteria was based on how well a project meets the primary objective of the program of addressing congestion by making specific improvements designed to reduce congestion in highly traveled and highly congested corridors through performance improvements that balance transportation improvements, community impacts, and that provide environmental benefits.

Using the San Joaquin County, Stanislaus County and Merced County "Three County" Regional Travel Demand Forecasting Model (TCM) for Year 2042 No Project Conditions, each of the fifty-three (53) projects was coded (added) to the Model. The quantitative results from the TCM in terms of reducing Vehicle Hours of Delay (VHD) was used to determine if the project resulted in a High Benefit (5), Medium Benefit (3) and Low Benefit (1).

Examples of projects that had High Regional Benefit to Reducing Congestion:

- Project # 3 - High Occupancy Vehicle (Carpool) / Express Lane from County Line to I-5 was determined to reduce VHD by 15%, therefore resulting in a High Benefit and a score of 5;
- Project #9 Valley Link Construction and Stations as Identified in Feasibility Study was determined to reduce VHD by over 10%, therefore also resulting in a High Benefit and a score of 5;
- Project #47; Stockton Diamond Grade Separation (UP Fresno Sub/BNSF Stockton Sub) was determined to reduce VHD by over 10%, therefore also resulting in a High Benefit and a score of 5;

On the other hand, Projects #25, 26, and 27 – Addition of auxiliary lanes was determine to reduce VHD by less than 2%, therefore resulting in a Low Benefit and a score of 1.

<u>Primary Evaluation Criteria – "Person" Throughput</u>

This complimentary evaluation criteria was used to determine how well the project increases person throughput. Using the quantitative results from the TCM in terms of in terms of reducing Person Throughput and reducing Person Hours of Delay (PHD) was used to determine if the project resulted in a High Benefit (5), Medium Benefit (3) and Low Benefit (1).

Examples of projects that had High Regional Benefit to Reducing Congestion:

- Project # 14 - I-205 Integrated Corridor Management Plan Implementation was determined to increase person throughput and reduce PHD by 9%, therefore resulting in a High Benefit and a score of 5;
- Projects #3, #9, and $#47 described above were all determined in increase person throughput and reduce PHD by over 12%, therefore resulting in a High Benefit and a core of 5;

On the other hand, Projects #30, #31, and #32, interchange projects on SR 120 were determined to increase person throughput and reduce PHD by less than 3%, therefore resulting in a Low Benefit and a score of one (1).

Secondary Evaluation Criteria - Safety

For the safety evaluation criteria, the SCCP Guidelines state that the project must address safety issues and concerns in the corridor, including actual reported property, injury, and fatality collisions for the last five (5) full years.

In terms of the highway, local streets and bus transit transportation system, the following hot spots were identified based on Traffic Analysis and Surveillance Analysis System (TASAS):

- Westbound I-205 between I-5 and I-580;
- Eastbound I-205 between Grant Line Road and MacArthur Boulevard interchanges;
- Eastbound SR 120 between Union Road and SR 99; and
- Southbound SR 99 between SR 120 and the Stanislaus River Bridge.

In terms of passenger rail, the following locations were identified:

- At-grade rail crossings with local streets;
- At grade rail crossing with freight trains;

Using the quantitative results from the TCM in terms of changes in mode-split, thereby moving people from single-occupancy to either carpools, transit or passenger / commuter rail were was used to determine if the project resulted in a High Benefit (5), Medium Benefit (3) and Low Benefit (1).

Examples of projects that had High Regional Benefit to Safety:

- Project # 3 - High Occupancy Vehicle (Carpool) / Express Lane from County Line to I-5 was determined to increase mode split for carpools and transit, therefore resulting in a High Benefit and a score of 5;
- Project #9 Valley Link Construction and Stations as Identified in Feasibility Study was determined to increase mode split for passenger / commuter rail, therefore also resulting in a High Benefit and a score of 5;
- Project #47; Stockton Diamond Grade Separation (UP Fresno Sub/BNSF Stockton Sub) was also determined to increase mode split for passenger / commuter rail, therefore also resulting in a High Benefit and a score of 5;

Secondary Evaluation Criteria - Accessibility

For the accessibility evaluation criteria, the SCCP Guidelines state that the project must address current accessibility issues and concerns in the corridor and how the proposed project will improve accessibility and connectivity to residents and non-residents that travel the corridor or need to travel through the corridor.

For this criteria, each of the fifty-three (53) projects was qualitatively reviewed based on the following three (3) key questions identified in the SCCP guidelines to determine if the project resulted in a High Benefit (5), Medium Benefit (3) and Low Benefit (1).

- Does the proposed project provide access to multimodal choices?
- Will the project close an existing gap in transit and active transportation?
- How will the project connect to jobs, major destinations and residential areas?

Secondary Evaluation Criteria – Air Quality / Green House Gases (GHG)

For the Air Quality / Green House Gases (GHG) criteria, the SCCP Guidelines state that the project must address how the proposed project will reduce greenhouse gas emissions and criteria pollutants and advance the State's air quality and climate goals.

Using the San Joaquin County, Stanislaus County and Merced County "Three County" Regional Travel Demand Forecasting Model (TCM) for Year 2042 No Project Conditions, each of the fifty-three (53) projects was coded (added) to the Model. The quantitative results from the TCM in terms of average travel speeds by five mile per hour speed bins was used to determine if the project resulted in a High Benefit (5), Medium Benefit (3) and Low Benefit (1).

Overall, projects that scored a high benefit in terms of the primary evaluation criteria of reducing congestion and increasing person throughput also scored high on the Air Quality / Green House Gas evaluation criteria.

Secondary Evaluation Criteria – Economic Development and Job Creation / Retention

For the Economic Development and Job Creation / Retention criteria, the SCCP Guidelines state that the project must address how the proposed project will support economic development and access to employment.

For this criteria, each of the fifty-three (53) projects was qualitatively reviewed based on the following two (2) key questions identified in the SCCP guidelines to determine if the project resulted in a High Benefit (5), Medium Benefit (3) and Low Benefit (1).

- Does the proposed project improve regional competitiveness?
- How does the proposed project improve accessibility to economic opportunities and the movement of goods and services in the region?

Secondary Evaluation Criteria – Efficient Land Use

For the Efficient Land Use criteria, the SCCP Guidelines state that the project must address how the proposed project will support transportation-efficient land use principles and supports mixed-use and in-fill development with multimodal choices. By integrating a greater mix of uses into congested corridors, efficient land use reduces vehicle-miles- traveled and congestion by placing more individuals within walkable distance to daily or regular destinations, such as jobs, services, retail, or transit.

For this criteria, each of the fifty-three (53) projects was qualitatively reviewed based on the following eight (8) key questions identified in a supplement developed by the CTC in partnership with the California Department of Housing and Community Development and the Governor's Office of Planning and Research to determine if the project resulted in a High Benefit (5), Medium Benefit (3) and Low Benefit (1).

- Is the project located in a jurisdiction(s) that has a by-right (nondiscretionary) approval process, adopted or in development, for multifamily residential and mixed-use development?
- Is the project located in, or adjacent to, an existing or proposed Specific Plan area, or similar area, that allows streamlined plan-level environmental analysis for multifamily residential and/or mixed-use development?

- Is the project located in a jurisdiction(s) that has a density bonus ordinance, adopted or in development, whose allowable density increase exceeds the requirements of State Density Bonus Law?
- Is the project located in a jurisdiction(s) that has an ordinance or other policy, adopted or in development, allowing reduced parking requirements for all sites zoned for multifamily residential or mixed-use development?
- Is the project located within a half-mile of a major transit stop, as defined by Public Resources Code section 21064.3; or a high-quality transit corridor, as defined by Public Resources Code section 21155?
- If the project is a transit stop or station, is it substantially surrounded (75 percent or more) by parcels developed for residential, commercial, public institutional, transit or transportation passenger facility, or retail use, or any combination of those uses?
- Is the project located in an area with per capital household vehicle travel that is 15 percent below regional or city average?
- Does the project further the forecasted development pattern of the applicable Regional Transportation Plan's Sustainable Communities Strategy?

California Life-Cycle Benefit / Cost Analysis Model

Based on the results of the SCCP Regional Benefits analysis; the following eleven projects were analyzed using the California Life-Cycle / Benefit Cost Analysis Model.

- Stockton Diamond Grade Separation
- SR 99 / SR 120 Connector Phase 1B Project
- I-205 Sub-Area Integrated Corridor Management Plan (System Management, Traveler Information and Commercial Vehicle Operations)
- SR 99 Sub-Area Integrated Corridor Management Plan (System Management, Traveler Information and Commercial Vehicle Operations)
- I-205 High Occupancy Vehicle Lane (Carpool) and Express Lane from County Line to I-5
- Valley Link Construction and Stations
- SR 120 High Occupancy Vehicle Lane (Carpool) and Express Lane from I-5 to SR 99
- I-580 High Occupancy Vehicle Lane (Carpool) and Express Lane from I-580 / Greenville Road to County Line
- Fixed Guideway Concept on I-580 / I-295 from Grant Line Road to Paradise Cut
- I-5 Mossdale Widening with High Occupancy Vehicle Lane (Carpool) and Express Lane
- SR 99 Widening with High Occupancy Vehicle Lane (Carpool) and Express Lane

The California Life-Cycle Benefit/Cost Analysis Model (Cal-B/C) was developed by Caltrans Headquarters (Sacramento) and offers a simple, practical method for preparing economic evaluations on prospective highway and transit improvement projects within the State of California. The model is capable of handling several general highway projects, such as lane additions, and more specific projects, such as HOV lanes, passing/truck climbing lanes, or intersections. The model can also handle several transit modes, including passenger rail, light rail, and bus. Cal-B/C was developed in a spreadsheet format (MS Excel) and is designed to measure, in real dollar terms, the four primary categories of benefits that result from highway and transit projects:

- Travel Time Savings
- Vehicle Operating Cost Savings
- Safety Benefits (Accident Cost Savings)
- Emission Reductions.

The results of the analysis are summarized on a per-project basis using several measures:

- Life-cycle costs (in $ million)
- Life-cycle benefits (in $ million)
- Net present value (in $ million)
- Benefit-cost ratio (benefits/costs)
- Rate of return on investment (in % return/year)
- Project pay back period (in years).

These results are calculated over the life of the project, which is assumed to be twenty (20) years. In addition, the model calculates and displays first-year benefits.

Project Input Information

Regional or state engineering and planning staff enter project data through the Cal-B/C input sheet. General project information includes the following:

- Project type (i.e., mode)
- Project location (i.e., urban Southern California, urban Northern California, rural California)
- Length of construction period (in years)
- Estimated length of the peak period (in hours).

In addition to the general information listed above, project-specific data serves to define the project more clearly within the Cal-B/C environment. For highway investments, project-defining data consist of:

- Highway design and traffic data:
  - Number of general traffic lanes
  - Number of HOV lanes
  - Estimated free flow speed
  - Length of highway segment and affected areas
- Average daily traffic
- Average hourly HOV traffic
- Three-year accident data for facility
- Statewide accident rates for existing and new highway facility.

For transit investments, project-defining data consist of:

- Annual person trips
- Percent trips occurring during peak period
- Percent trips originating on parallel highway
- Annual passenger miles
- Average vehicles per train
- Transit accident reduction
- Average travel time on transit.

Cal B/C Economic Assumptions

Cal-B/C provides all the necessary values and rate tables necessary to proceed with the benefit-cost analysis. The economic values include the following:

- Real discount rate: All dollar values used in the model are in constant dollars. Cal-B/C currently uses a real discount rate of 6 percent. This rate is calculated based on the historical real interest rate and long-term average real rate of return on public fund investments, plus a risk premium to discount all future costs and benefits to the present.
- Value of time for automobile, truck, and transit passengers: Current values of travel time used by the model are $8.16 per hour, $27.72 per hour, and $8.16 per hour for autos and trucks, and transit passengers respectively.
- Vehicle operating costs: The model provides a look-up table for fuel consumption (in gallons per mile) for autos, trucks, and buses as a function of speed. To calculate total fuel costs, fuel consumption is multiplied by fuel cost per gallon minus taxes (currently $1.14). Non-fuel costs are estimated per mile (currently $0.165 per mile for autos, and $0.285 per mile for trucks).
- Accident costs: For highways, the model provides average costs for fatality, injury, and property damage only accidents. For transit, the model provides average costs per fatality, injury, and vehicle damaged.
- Emissions costs: The model provides health cost estimates per ton of emissions for CO, NOX PM10, andVOC.

Three County Model Data

Using the Three County Regional Travel Demand Model, peak and non-peak speed and volume data for current conditions and two future scenarios were used:

- Future Year 2042 Without Project
- Future Year 2042 With Project.

The current year data are used to approximate the year the project opens. The future scenario year is chosen to be as close as possible to Year 20 after project construction is completed.

Benefit / Cost Investment Analysis – Summary Results

Life-Cycle Benefit Analysis

The model estimates the value of four benefits for the project using speed and volume data:

- Travel Time Savings
- Vehicle Operating Cost (VOC) Savings
- Safety Benefits (accident cost savings)
- Emissions Reductions.

These benefits are calculated over a twenty-year life-cycle for the project. The twenty-year period is calculated from the time the benefits begin (i.e., the project opens). Benefits are calculated on an annual basis and summed over the twenty- year period.

The inputs to all benefit calculations are estimates of annual speeds and traffic volumes with and without the project. After values for Year 1 and Year 20 have been calculated, input values for intervening years are calculated using straight- line interpolation:

$Value_t$ = $Value_{Year\ 1} + (t/y) * (Value_{Year\ 20} - Value_{Year\ 1})$, where Value is speed or volume

$Value_t$ = value for benefit calculation

$Value_{Year\ 1}$ = value for current year

$Value_{Year\ 20}$ = value forecasted for 20 years from beginning of benefit

t = year for benefit calculation

y = number of years from current year to twenty years after benefits begin

Travel Time Savings Analysis

The model follows these steps to calculate estimates of annual and 20-year delay savings on highways:

1. Based on the base and future-year ADT projections, the model estimates future annual ADTs, without and with the improvement project, assuming straight-line growth.
2. Annual ADTs are multiplied by the affected length and then divided by the traffic speed to find the total travel time, without and with the improvement project.
3. Annual travel time savings (the difference between total travel time without and with project) are multiplied by the value of time and average vehicle occupancy for each mode to convert travel time savings into dollar values.
4. The dollar value of travel time savings are discounted to estimate their present value.

The process for transit travel time savings is similar except that annual person trips and total travel time are provided by the user.

Vehicle Operating Cost (VOC) Savings Analysis

The change in highway vehicle operating costs (increased fuel use, vehicle wear and tear, etc. due to improved speed) are estimated as follows:

1. Estimated future annual ADTs are multiplied by the affected segment length to find annual VMT, with and without the project as well as the difference (VMT savings).
2. For each mode, annual VMT savings are multiplied by the fuel consumption (from look-up table based on average speed) and the unit fuel cost to find the dollar value for fuel VOC savings. Annual VMT savings are multiplied by unit non-fuel VOC to find the dollar value of non-fuel VOC savings.
3. Future annual VOC savings are summed across modes and discounted to obtain their present value.

Safety Benefits (Accident Cost) Savings Analysis

Accident cost savings on the highway are determined as follows:

1. The aggregated accident cost (per million miles) is calculated by multiplying the accident rate by accident cost for each type of accident and summing the result. Transit accident cost savings are calculated similarly, except that the aggregated accident cost is calculated by accident event (i.e. fatality, injury, property damage) rather than accident type.
2. Annual VMT (in million miles) is multiplied by aggregate accident cost (per mile). The result is the annual cost of accidents, without and with the projects.
3. The difference (change in accident cost) is discounted to find the present value of future safety benefits.

The methodology used in Cal-B/C ensures that accident values are treated consistently across modes.

To estimate the impact of a transportation project on accident costs, Cal-B/C compares accident costs under two scenarios: with the project and without the project. Accident costs are compared over the lifetime of the project, which is assumed to be twenty (20) years. For each year, benefits are calculated as:

Accident Benefit = Accident Cost Without Project - Accident Cost With Project

Accident benefits are summed over the twenty-year period to derive the total impact. Individual projects may improve or adversely impact vehicle accidents, so the net result may be positive or negative.

In valuing the cost of vehicle accidents, Cal-B/C uses costs estimated by the National Safety Council for fatalities and injuries. The National Safety Council data allow accident costs to be computed consistently across modes by using the same value for individual fatalities and injuries. Although many benefit-cost models rely on the Urban Institute/FHWA figures, these costs are estimated for accidents by severity type (e.g., fatal accidents) rather than by event and cannot be used for non-highway modes.

Cal-B/C uses a variety of sources for property damage costs, since the value of vehicles vary by mode. For each mode, the model uses the best estimate available. The derivation of these estimates are described in separate sections on highway and transit costs.

The impact of a highway project on accident costs is estimated by examining the change in highway accidents as a result of the project. Transit accidents are assumed not to be affected. Since Caltrans has more detailed highway accident data available by severity, Cal-B/C calculates highway costs by accident severity rather than per event.

The impact of a transit project on accident costs is estimated by examining the change on transit and on a parallel highway. Most new transit users are expected to come from the highway as a result of the transit project. This shift effects remaining highway users. The project may also impact the occurrence of accidents on transit.

Transit accident statistics are not available to Caltrans. For transit modes, Cal-B/C uses national accident rates reported by the U.S. DOT. Since these statistics are tabulated by event (i.e., number of fatalities, injuries, and accidents), Cal-B/C calculates the value of transit accidents per event rather than by accident severity.

Emission Cost Savings Analysis

The values of highway emissions reductions are calculated as follows:

1. The aggregate emissions cost (per mile) is calculated by multiplying the emissions rate by the emissions cost for each type of emission and summing the results.
2. Annual VMT (in miles) is multiplied by the aggregate emissions cost. The result is the annual emissions cost, with and without the project.
3. The difference (change in emissions cost) is discounted to find the present value of future emissions benefits.

Value of transit emissions reductions are calculated similarly, except that vehicle-miles (train-miles in the case of passenger trains) are used in place of VMT.

Highway Benefit / Cost Analysis Methodology

The Caltrans model calculates travel time savings for highway users as a function of highway speeds, traffic volume and the value of time. Since speeds vary over the course of the day and for different types of vehicles, benefits are calculated separately for trucks and automobiles as well as for the peak period and the non-peak period, and then summed for the year. Annual benefits are summed across the twenty-year life cycle of the project.

To calculate the number of trucks, Cal-B/C asks the user to input the percent truck traffic. If the user is unable to supply information specific to the project, the model uses a default value of 9 percent, which was calculated from the 1998 California Motor Vehicle Stock, Travel and Fuel Forecast.[14] Vehicles with a gross vehicle weight under 8500 pounds are included as automobiles.

For each period by vehicle type, benefits are calculated using the following formula:

Value of Time Savings = Value of Time *
(Travel TimeWithout Project - Travel TimeWith Project).

Travel time with and without the project are calculated using the appropriate speed and ADT for the period and vehicle type:

Travel Time = Affected ADT * (Affected Length/Speed).

The affected length is the length of the highway that is affected by the project. This length is generally the same as the length of the highway segment.[15]

Transit Benefit / Cost Analysis Methodology

The evaluation of transit projects must consider the travel time benefits that occur on transit, as well as the travel time improvement that may be experienced by highway users who shift modes to transit. Whether the transit project involves bus, light rail, or passenger train modes, the travel time calculations are essentially the same.

The objective is to estimate the travel time costs or savings that result from the proposed project.

For each year, travel time is broken down into peak period and non-peak period and the benefits are summed. Travel time benefits are calculated for two user groups:

- Existing transit riders
- New transit riders that came from a parallel highway.

Travel time benefits for existing transit riders are calculated as the difference in travel times multiplied by the number of existing riders and the value of time.

For new transit riders that came from a parallel highway, the benefit is calculated based on the travel time difference between the highway and transit for the with project scenario. If the difference in travel time is negative (i.e., the travel time is smaller on the parallel highway than on transit), the benefit is assumed to be zero. The new transit riders must have shifted models for reasons other than travel time savings. Assuming that these new riders are rational in their decision making, the sum of these benefits must be positive. Since Cal-B/C is unlikely to capture all of the benefits (e.g., the value of reducing ones stress by not having to drive, the improved reliability of transit, etc.), the model conservatively estimates that the new transit riders do not receive a benefit.