

**CHAPTER 7 FUTURE LINKS**

This Chapter deals with key future trends that may affect the RTP in future cycles. Forecasting for more than 5 years can be problematic and should be updated regularly. The Future Links Chapter discusses some major game changers that need to be watched closely with each update of the RTP including:

- Corridor Preservation
- Needed Unfunded Projects and Financial Mechanisms
- Adaptive Cruise Control/Autonomous Vehicle Technology
- High Speed Rail
- Air Quality Contingencies
- Valleywide Chapter

**CORRIDOR PRESERVATION**

It is important to identify and preserve transportation corridors needed to expand or enhance transportation for Kern County's future growth. The Kern region's local governments will find it difficult to obtain optimal locations for these corridors unless efforts to preserve them are made early.

The American Association of State Highway and Transportation Officials (AASHTO) Report on corridor preservation states that early efforts provide the following benefits:

- Prevent inconsistent development;
- Minimize or avoid environmental, social, and economic impacts;
- Prevent loss of desirable corridor locations;
- Allow for orderly assessment of impacts;
- Permit orderly project development; and
- Reduce costs.

Ideally, planners and policymakers will begin preparing strategies for preserving corridors now as part of the long-range planning process. Planning prevents losing right-of-way that will become necessary for transportation beyond 2035. The county and cities can adopt a specific plan line to preserve open land in undeveloped and rural areas. More opportunities to capitalize on preservation are available in less urban areas, where local governments have an opportunity to obtain available land for new transportation facilities.

The first step to identify potential long-range corridors and determine that a need exists to preserve them is in the development of the General Plan's circulation element. Usually prepared as part of an environmental document, a transportation study using traffic modeling as appropriate can be performed on the ultimate buildout of a General Plan's land use element. The study would determine the need and size of the facility that would be identified in the circulation element. The process can be performed for vehicle, transit, bike, and pedestrian facilities, as well.

On state highways, a project initiation document is developed for major projects. The next step often is to preserve the right-of-way for the transportation corridor using a specific plan line adoption by the local governments involved. An environmental document and funding component is developed at that time.

The following High Emphasis Interregional Routes are identified by Kern Council of Governments (Kern COG) and the California Department of Transportation (Caltrans) as high priority corridors. These corridors are also identified as future circulation needs in the respective city or county General Plan circulation elements.

| <b>Table 7-1: High Emphasis Interregional Routes</b>                                 |  |
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| <b>Post-2042 Long-Range Corridors</b>  |  |
| <b>Corridor</b>  | <b>Source</b>  |
| <b>Transit/Passenger Rail Corridors</b>  |  |
| Bus Transit Link to Mammoth/Reno   | Eastern Sierra Planning Partnership  |
| Palmdale/Rosamond/Edwards AFB Commuter Rail  | 2012 Commuter Rail Study   |
| Wasco/Bakersfield/SW Bakersfield Commuter Rail                                       | 2012 Commuter Rail Study   |
| Delano/Bakersfield/Arvin Commuter Rail   | 2012 Commuter Rail Study   |
| California High-Speed Train Los Angeles to SFO Bay Area                              | CAHSR Authority 2012 Revised Business Plan   |
| <b>Intermodal Corridors</b>  |  |
| SR 58 Centennial Corridor/Westside Parkway (SR99 to I-5 New Freeway Alignment)       | City of Bakersfield; Kern County; Kern COG; Caltrans                                   |
| Seventh Standard Road/North-West Intermodal Corridors                                | City of Bakersfield; City of Shafter; Kern County; Kern COG                            |
| West Trade Corridor  | City of Bakersfield, City of Shafter; Kern County; Kern COG                            |
| UP/BNSF Rail Corridor (Bakersfield to Tehachapi) Route 58 (Bakersfield to Tehachapi) | Caltrans; Kern COG   |
| Route 46 Highway to Expressway Conversion (Countyline to Famoso)                     | Kern County; City of Wasco; Caltrans; Kern COG   |
| <b>Kern County Trade Corridors</b>   |  |
| South Trade Corridor   | City of Bakersfield; Kern County; Kern COG   |
| South Arvin-Taft Corridor  | Kern County; City of Arvin; City of Taft; Kern COG                                     |
| Rural Truck Network  | Kern County; City of Shafter; Kern COG   |
| East Trade Corridor  | City of Bakersfield; Kern County; Kern COG; City of Bakersfield; Kern County; Kern COG |

**NEEDED UNFUNDED PROJECTS AND FUNDING MECHANISMS**

Under current federal surface transportation legislation, regional transportation plans must demonstrate all proposed projects are capable of being fully funded within the RTP’s time frame. This requirement has constrained regions to spotlight and prioritize high performing, cost-effective projects. This approach enables the Kern region to focus on immediate transportation priorities.

Beyond the RTP horizon year of 2046, an estimated \$36.9 billion in unmet transportation needs within the Kern region for capital improvements, operation, and maintenance remain unfunded because of lack of federal, state, and local monies. Over half, \$20 billion, is unfunded high speed rail construction in the Kern region. Kern COG, in cooperation and coordination with its stakeholders, maintains a list of capital projects that are financially unconstrained (see Table 5-2). Conceivably, as the future funding picture changes, some of these projects could be advanced to constrained status in future RTP updates.

Kern County is forecasted to continue experiencing growth, which will add more traffic and tax the capacities of the street and highway system. In an effort to expand needed transportation facilities before traffic congestion causes the road system to fail, Kern COG has proposed that the cities and County of Kern implement a transportation impact fee (TIF) to pay for needed transportation facility improvements. Kern COG is developing a series of sub-regional traffic impact fee studies throughout the county. At this time, Metropolitan Bakersfield, Wasco, Shafter, Delano, McFarland, Tehachapi, greater Tehachapi, and Rosamond (unincorporated) have adopted TIFs. Other communities that may have some type of additional traffic impact fee now include Ridgecrest, Arvin, California City and Maricopa. The challenge for smaller communities is that growth patterns may not support regionally significant improvements on the state highway system. All communities require developer funded traffic mitigation as part of their approval process.

Adopting a new transportation impact fee will require working closely with both the local development community and the Kern community at large to gain acceptance to fund needed rights-of-way and widening improvements to transportation facilities that are deemed deficient. Kern COG is also studying an impact fee on new warehousing in the region to support regional improvements through the Kern Area Regional Goods Movement Operations (KARGO) Sustainability Study.

Issuance of bonds to finance and deliver projects more rapidly is a common practice. Under a Federal Highway Administration program, GARVEE Bonds are being considered for some of the larger corridor projects within the Kern region. The minimum needed for GARVEE Bond projects is such that only the largest corridor projects would be eligible.

#### ADAPTIVE CRUISE CONTROL AND AUTONOMOUS VEHICLE TECHNOLOGY

Adaptive Cruise Control (ACC) vehicle technology may extend the life of the transportation system. The technology automatically adjusts the vehicle's speed, braking and steering to keep a safe distance from the vehicle ahead. If 40% of the vehicles on the road have this autonomous level 3-4 technology, throughput could double, delaying the need to add lanes to existing facilities, as well as reducing emissions at traffic signals by more than 33%<sup>1</sup>. The technology still has numerous human factor issues that need to be resolved before the technology can be implemented successfully. Cooperative ACC (CACC) uses both the forward-ranging sensors of ACC and vehicle-to-vehicle (V2V) communication allowing for the cooperative movement of vehicles, assisting with vehicle merging and platooning. CACC use in heavy duty trucks is expected to lead to truck platooning to improve efficiency, resulting in safety improvements and lower cost per mile for truck fleets, spurring adoption. As ACC, CACC and the supporting technologies continue to emerge, policies and investments by federal, state, and local transportation agencies will continue to evolve as well.

ACC and associated technologies are expected to progress toward full Automated Driving Systems (ADS) beyond 2025, when advances to fully automated safety features and highway autopilot are expected. Ultimately ADS will be able to handle the whole task of driving when desirable. Released in 2017, the U.S. Department of Transportation National Highway Traffic Administration stated, "automated vehicle technologies possess the potential to save thousands of Automated Driving Systems technology effectiveness increases when integrated with infrastructure technology. Road system

**In 2021, there are 23 car models in the market at level 2, semi-automated systems for steering, speed and/or braking**

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<sup>1</sup> Federal Highways Administration, Cooperative Adaptive Cruise Control: Human Factors Analysis 2013. <https://www.fhwa.dot.gov/publications/research/safety/13045/13045.pdf> , pp. 5-6.

technologies such as intersection controls are considered necessary to reap the full benefits of ADS. lives, as well as reduce congestion, enhance mobility, and improve productivity.”<sup>2</sup>

Of the five levels of ADS in 2021, level 1, cruise control, is available on nearly all models. In 2021, there are 23 car models in the market at level 2, semi-automated systems for steering, speed and/or braking. One level 3, from Volkswagen Group, that has released “Traffic Jam Assist” in Europe that allows fully autonomous driving at speeds under 37 mph.<sup>3</sup> As the price goes down and the technology demonstrates acceptance, regions will need to update the highway capacities in the regional travel models. It is important to note that the Kern travel model uses a congestion feedback loop that accounts for latent demand caused when throughput capacity is increased. Corridors that are congested today may not see complete elimination of congestion if capacity were to double. For example, peak period weekend and holiday travel to southern California will likely continue to see congestion even if capacity were doubled. High volume alternative modes such as passenger rail, transit and air service are anticipated to still be needed to handle travel demands during peak periods and holidays.

## HIGH-SPEED RAIL

The California High-Speed Rail Authority (CHSRA) is statutorily required to adopt a Business Plan every two years. The most recent, as of the writing of this document, is the 2020 Business Plan. With the passage of Senate Bill (SB) 862, the Legislature and Governor approved an annual appropriation of 25% of the annual Cap and Trade proceeds on a continuous basis to fund high-speed rail. The 2020 Business Plan focuses on achieving the following:

- Complete environment documents on 291 miles of the nearly 500 miles from San Francisco to Los Angeles;
- Deliver needed right-of-way parcels to the contractors to advance construction;
- Complete all critical land right conveyances, and execute the remaining third-party agreements;
- Construction will be substantially complete or underway on 83 of the 93 structures (90 percent) and 106 of 119 miles of guideway (90 percent);
- Construction Package 1: Clear remaining utility conflicts to allow existing construction to advance and move forward on the remaining 19 structures necessary to complete guideway construction; install Union Pacific Railroad bypass tracks at three major locations to allow heavy construction work along the alignment in Fresno at Ventura and Tulare Streets, the Fresno Trench and Herndon Avenue; increase daily on-site construction workers to 500;
- Construction Package 2-3: Complete nearly half (31 miles) of total guideway construction and clear the remainder for construction advancement without further delay; complete 17 structures and have all remaining structures under construction; increase daily on-site construction workers to 900;
- Construction Package 4: Increase daily on-site construction workers to 250 and complete all outstanding right of way and pre-construction to allow for unimpeded progress towards completion. This segment will be ready for track and systems work to begin in 2022; and
- Award the Track and Systems Contract and begin design to start construction in 2022.
- Lays out an approach to sequencing the Phase 1 system that will ultimately connect the San Francisco Bay Area to Los Angeles Basin via the Central Valley;

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<sup>2</sup> U.S. Dept. of Transportation, National Highway Transportation Safety Administration. Automated Driving Systems 2.0: A Vision for Safety. 2017 [https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/13069a-ads2.0\\_090617\\_v9a\\_tag.pdf](https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf)

<sup>3</sup> Autopilot Review. Cars with Autopilot in 2021. 2021 <https://www.autopilotreview.com/cars-with-autopilot-self-driving/>

- Describes the plan to deliver high-speed rail service connecting the Silicon Valley to the Central Valley, and offer high-speed rail passenger service between these two important economic regions within the next ten years;
- Provides a clear path for making concurrent investments in concert with regional partners and delivering early, tangible mobility and safety benefits in southern California, while building a solid foundation for the critically important passenger rail corridor that links Burbank, Los Angeles, and Anaheim;
- Commits to completing environmental clearance, and selecting alignments and station locations for the remaining sections to position the entire system to be ready for immediate construction as funds become available; and
- Provides updated capital cost estimates, showing that the projected cost of the entire system has been revised downward by \$5.5 billion. This lower cost estimate comes about mainly through value engineering efforts, better operational and technical approaches to design, and a favorable bidding environment.

The overall Phase 1 cost estimate for the same scope of work described in the 2018 Business Plan is , up to \$69,078 billion as a low estimate and \$99,881 billion as a high estimate. To drive down initial operating costs, the Authority, working with the early train operator, has suggested beginning the Phase 1 service with a single-track service to further reduce initial capital costs. Reducing tracks and other related cost reduction strategies have reduced the low estimated costs by 10.6% and the high estimated cost by 2% (as compared to the 2018 Business Plan).

With the goal of getting a high-speed passenger rail line into operations as quickly as possible, the CHSRA evaluated how best to sequence the program. Analysis shows that the line that can be funded and built within projected sources, and initiate revenue producing operations quickly, connects the Silicon Valley (San Jose) to the Central Valley north of Bakersfield.

The CHSRA ha also adopted a goal of completing a connection between the City of Merced and San Jose as part of the initial Silicon Valley to Central Valley line. Connecting the cities of the northern San Joaquin Valley will create economic opportunities for residents of the Valley, alleviate the jobs-housing imbalance in the Bay Area that has created 2 to 3 hour commute trips, and at the same time relieve air quality concerns from vehicle miles traveled (VMT) by cars and light duty trucks.

Table 7-2 shows the ridership forecast for the high-speed rail on Phase 1 of the Silicon Valley to Central Valley Line from 2033 to 2060. Figure 7-1 illustrates the future potential that HSR has in coalescing emerging megaregions.

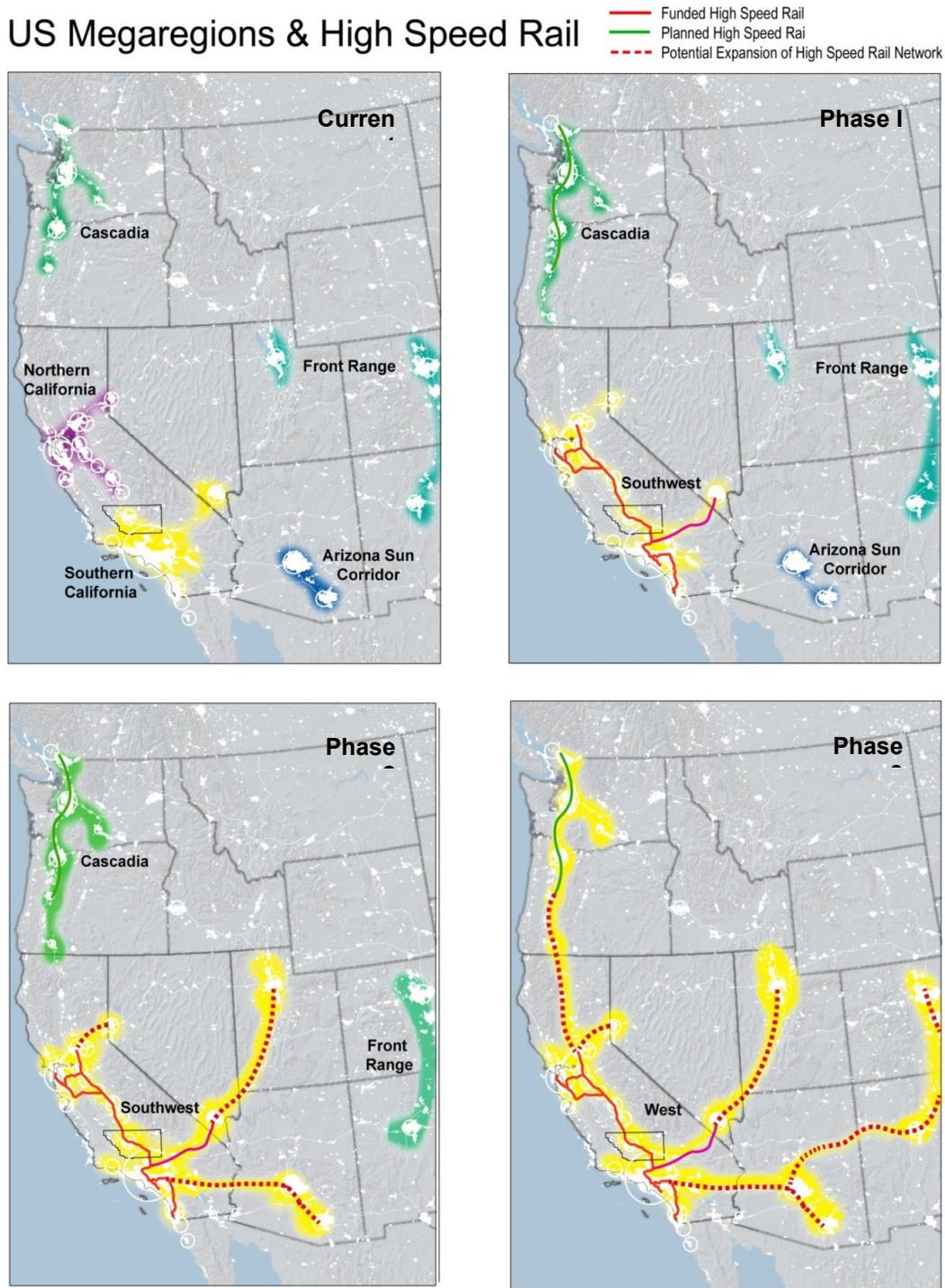
Megaregions are large-scale economic units of multiple large cities and their surrounding areas. The Regional Plan Association ([www.america2050.org](http://www.america2050.org)) has identified emerging megaregions in North America, with California currently depicted as

| Ridership Level  | 2033 | 2034 | 2035 | 2040 | 2045 | 2050 | 2055 | 2060 |
|------------------|------|------|------|------|------|------|------|------|
| High Ridership   | 17.9 | 36.4 | 41.9 | 50.0 | 52.6 | 55.2 | 58.1 | 61.0 |
| Medium Ridership | 12.8 | 27.8 | 32.0 | 38.6 | 40.5 | 42.6 | 44.8 | 47.1 |
| Low Ridership    | 10.3 | 21.3 | 24.5 | 29.3 | 30.8 | 32.3 | 34.0 | 35.7 |

having two separate megaregions: northern and southern. Kern County is assigned to southern California, the largest and fastest growing megaregion in the United States with over half of the west Coast's population. As HSR segments are completed, travel times between the megaregions will decrease, increasing the economic links allowing them to coalesce into a single market area, expanding economic opportunities. A 2-hour, 37-minute train ride between northern and southern California will allow businesses

to have one office in both regions. Kern County, located at the center of the emerging southwest megaregion, stands to benefit significantly from high-speed rail because of its location at the center of the system.

**Figure 7-1 – Connecting West U.S. Megaregions with High Speed Rail Phases**



\*Adapted from *The Emerging Megaregions* 2008 by Regional Plan Association

Experience in implementing HSR in other countries has found that HSR competes best at 200 to 300 mile distances. Shorter than that and automobile travel is more competitive, longer than that and airline travel is more competitive. Megaregions in the west are conveniently spaced about 300 miles apart, driving expansion of the system to connect to the largest megaregion (southern California). Other countries have also found that opening day ridership exceeded forecasts in every instance.

### **Terminal Impact Analysis**

The City of Bakersfield, in partnership with and funding from the CHSRA, has completed a High-Speed Rail Station Area Plan (Plan) for downtown Bakersfield. The study area includes the approximate boundaries of the Kern River and 38th Street to the north, California Avenue to the south, Union Avenue to the east, and F Street to the west.

During the Station Area planning process, the City identified and analyzed opportunities and challenges in order to develop an urban design, multi-modal (pedestrian, bicycle, automobile, transit) transportation, and economic development strategy that optimizes future growth in downtown. It also addressed jobs, housing, retail, entertainment, art, cultural amenities, pedestrian and bicycle access, parking, streetscape improvements, lighting, wayfinding, open space and recreation, and sustainability.

The Plan will serve as a vision document that guides the future development of the HSR station area and greater downtown Bakersfield. The vision plan is used to pursue and leverage public and private sector funding for implementation actions, as well as create a baseline document for future planning efforts.

The downtown Bakersfield High-Speed Rail Station Area Plan, will act as a vision document that will:

1. Increase population and economic density in the urban core;
2. Support residential and commercial activity;
3. Develop under-utilized or vacant properties;
4. Connect existing activity and cultural centers;
5. Create an efficient, reliable and effective multi-modal transportation system;
6. Enhance sustainability, livability and a unique sense of place; and
7. Secure funding for identified implementation actions.

Amtrak, Golden Empire Transit, Kern Transit and Greyhound have existing facilities in the Plan area.

### **Potential Commuter Rail Feeder System**

The State of California has invested \$393 million in track and signal improvements to the San Joaquin Valley BNSF line, in exchange for permission to run six passenger trains per day. These existing slots could be used for a commuter rail service to connect the proposed High-Speed Rail Heavy Maintenance Facility with the Bakersfield High-Speed Rail Station. If 10% of the Heavy Maintenance Facility employees use the commuter service, that would provide 150 regular riders per shift. The Wasco/Metro Bakersfield commuter

rail corridor will have one million residents by 2035 and would provide a feeder rail service that could increase ridership and profitability of the high-speed rail system. Future expansion of the system to east Bakersfield, Lamont, and Arvin, as well as to Meadows Field Airport, McFarland, and Delano, was suggested in the 1997 Major Transportation Investment Study and the 2012 Kern Commuter Rail Study.

### **Heavy Maintenance Facility**

The California High-Speed Rail Authority (Authority) issued a Request for Expression of Interest (RFEI) identifying potential sites for planned Heavy Maintenance Facilities (HMF) in January 2010. The Authority specified in the RFEI that a HMF site be located in the Central Valley along the proposed route between Merced and Bakersfield. The site would require approximately 154 acres, building footprints would encompass 631,000 to 840,000 sq. ft., and up to 1,500 employees would be needed during peak shifts.

Kern COG on behalf of the County of Kern, cities of Wasco and Shafter submitted proposals for a HMF site in Wasco south of Hwy 46 and east of the existing BNSF tracks, and two sites in Shafter north of Seventh Standard Road on both the east and west sides of the BNSF tracks. The proposed sites in Kern were recommended for continued study in the Authority's Fresno-Bakersfield Section Supplemental Alternative Analysis (May 2011), and carried forward in the Revised Fresno to Bakersfield Section EIR-EIS (November 2013). There were over ten proposals originally accepted by the Authority. Three of the five proposed sites being carried forward are located in Kern County. One of these sites is proposed to be provided to the project at no cost. The Authority has since identified an interim HMF location at the site South of Fresno.

The location of the HMF could become the center for a new industry cluster related to passenger rail manufacturing that could see rail related industries relocate to that facility providing benefits well beyond the 1,500 jobs needed to operate the HMF and the HSR system.

### **AIR QUALITY CONTINGENCIES**

Air quality uncertainties could play a critical role in future funding linkages. In areas such as the San Joaquin Valley that may fail to attain federal clean air standards by the mandated deadlines, the federal Clean Air Act Amendments of 1990 (CAAA) can require withholding funding for capacity-increasing transportation projects, including projects funded from non-federal sources. In the San Joaquin Valley, up to \$2 billion in transportation funds could be at stake. A variety of mechanisms in the CAAA can require withholding transportation funds, including highway sanctions, conformity lapses, and conformity freezes.<sup>4</sup> Should one of these occur, Kern COG may be required to amend its TIP and RTP to fund additional projects that are proven to reduce emissions and/or improve safety. With federal highway sanctions, the US Environmental Protection Agency would prepare a Federal Implementation Plan (FIP) that would reprogram TIP funding to projects that improve air quality and allow the region to demonstrate attainment of federal clean air standards.

Transit improvements, intermodal freight facilities, transportation-related air quality control measures, and safety projects can be exempt from federal highway sanctions, lapses, and freezes. It is prudent to consider studying these types of projects as funding becomes available, to provide local policymakers with a complete range of options should funding interruptions become imminent. Many of these project types are already funded through a mix of resources. Every effort is made to attain federal standards by identifying and implementing cost-effective methods that reduce transportation-related emissions from single-occupant vehicles.

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<sup>4</sup> Highway sanctions, conformity lapses, and conformity freezes are mechanisms in the federal Clean Air Act Amendments of 1990 that are triggered when a region fails to demonstrate attainment of federal clean air standards by required deadlines.

VALLEYWIDE CHAPTER

Included as Appendix F, the San Joaquin Valley Regional Overview provides an interregional perspective for transportation planning throughout the San Joaquin Valley. It presents an overview of cross-jurisdictional issues facing the eight related counties and regional transportation planning agencies within Central California.