Fresno Council of Governments

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Reverse Triangle Transportation Area Plan (RTTAP)
Meeting #2 – Project Team Meeting

Agenda

Date: Wednesday, September 4, 2019
Place: **Fresno COG** Ash Room
Call-in Information: For those unable to attend:
(888) 398-2342 Code: 740166
Time: 2:00 PM – 4:00 PM

Note: Copy of the agenda items are posted on the Fresno Council of Government's website (https://www.fresnocog.org/project/special-studies/). Additionally, there will be a two week period provided for team members to provide comments from the date of this meeting.

Item Description

1. Introductions – Please sign in

a. Fresno COG & Partners
b. GHD Team: GHD, Regional Government Services (RGS), New Economics & Advisory, Townsend Public Affairs (TPA)

2. Logo/Social Pin Point (Please access prior to meeting)

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

https://fresnocogreversetriangleplan.mysocialpinpoint.com/home

3. Discussion: Working Papers

a. Goals & Policies
b. Collision Data
c. Bikeway Facility Types
d. Transit
e. Freight and Goods Movements
f. Plan Line
g. Funding Opportunities
h. TTR and Congestion Threshold
i. Intersection Operations Analysis (Existing Conditions)

City of Clovis
City of Coalinga
City of Firebaugh
City of Fowler
City of Fresno
City of Huron
City of Kerman
City of Kingsburg
City of Mendota
City of Orange Cove
City of Parlier
City of Reedley
City of San Joaquin
City of Sanger
City of Selma
County of Fresno

4. Economic Conditions

a. General Economic Conditions of the Study Area

b. Summary of Interviews with Key Stakeholders

5. Community Engagement/Workshops

a. Community Engagement Plan

b. Discussion on Venue Times and Dates – 1st Workshop (prior to holidays)

c. Discuss Future Meetings/Workshops (3) prior to June 2020

6. Tentative Schedule

a. Admin Draft Scheduled for May/June 2020 (for use in applications)

b. Draft/Final Draft Scheduled for July/August 2020

c. Final Due to State September 2020

7. Next Steps (discussion)

8. Adjourn

2. Goals & Policies Relevant to RTTAP

This section summarizes the goals and its relevant policies that influence the RTTAP study. Many goals and policies identified below are derived from previous plans and studies that were approved and/or adopted by local and state jurisdictions. It is important to maintain relative plan consistencies in an effort to improve overall circulation of all modes of travel within the study area.

2.1 City of Fresno

2.1.1 General Plan

The City of Fresno provides for the mobility of people and goods within the City. Adopted in 2014, the *City of Fresno General Plan* serves as the City's guide for ongoing and continued development, enhancement and revitalization of the Fresno metropolitan area and outlying neighborhoods, including some that potentially impact the RTTAP. Numerous transportation facilities within the RTTAP are located within the City of Fresno's jurisdiction. The following goals and policies related to applicable land use and transportation and circulation of the RTTAP supports a number of the Mobility and Transportation Element objectives and policies of the General Plan, specifically:

Roadways and Automobiles

***Objective MT-1:* Create and maintain a transportation system that is safe, efficient, provides access in an equitable manner, and optimizes travel by all modes.**

Policy MT-1-d: Integrate Land Use and Transportation Planning. Plan for and maintain a coordinated and well-integrated land use pattern, local circulation network and transportation system that accommodates planned growth, reduces impacts on adjacent land uses, and preserves the integrity of established neighborhoods.

Policy MT-1-f: Match Travel Demand with Transportation Facilities. Designate the types and intensities of land uses at locations such that related travel demands can be accommodated by a variety of viable.

Policy MT-1-g: Complete Streets Concept Implementation. Provide transportation facilities based upon a Complete Streets concept that facilitates the balanced use of all viable travel modes (pedestrians, bicyclists and motor vehicle and transit users), meeting the transportation needs of all ages, income groups, and abilities and providing mobility for a variety of trip purposes, while also supporting other City goals.

Policy MT-1-k: Multi-Modal Level of Service Standards. Develop and use a tiered system of flexible, multi- modal Level of Service standards for streets designated by the Circulation Diagram (Figure MT-1 of the General Plan). Strive to accommodate a peak hour vehicle LOS of D or better on street segments and at intersections, except where Policies MT-1-m through MT-1-p provide greater specificity. Establish minimum acceptable service levels for other modes and use them in

the development and environmental review process.

Policy MT-1-m: Standards for Planned Bus Rapid Transit Corridors and Activity Centers. Independent of the Traffic Impact Zones identified in MT-2-I, strive to maintain the following vehicle LOS standards on major roadway segments and intersections along Bus Rapid Transit Corridors and in Activity Centers:

- *LOS E or better at all times, including peak travel times, unless the City Traffic Engineer determines that mitigation to maintain this LOS would be infeasible and/or conflict with the achievement of other General Plan policies.*
- *Accept LOS F conditions in Activity Centers and Bus Rapid Transit Corridors only if provisions are made to improve the overall system and/or promote non-vehicular transportation and transit as part of a development project or a City-initiated project. In accepting LOS F conditions, the City Traffic Engineer may request limited analyses of operational issues at locations near Activity Centers and along Bus Rapid Transit Corridors, such as queuing or left-turn movements.*
- *Give priority to maintaining pedestrian service first, followed by transit service and then by vehicle LOS, where conflicts between objectives for service capacity between different transportation modes occur.*
- *Identify pedestrian-priority and transit-priority streets where these modes would have priority in order to apply a multi-modal priority system, as part of the General Plan implementation.*

Policy MT-1-n: Peak Hour Vehicle LOS. Maintain a peak-hour vehicle LOS standard of D or better for all roadway areas outside of identified Activity Center and Bus Rapid Transit Corridor districts, unless the City Traffic Engineer determines that mitigation to maintain this LOS would be infeasible and/or conflict with the achievement of other General Plan policies.

Policy MT-1-o: LOS Deviations Outside of Activity Centers and Areas Designated for Mixed-Use. Accept vehicle LOS E or F conditions outside of identified multi-modal districts only if provisions commensurate with the level of impact and approved by the City Traffic Engineer are made to sufficiently improve the overall transportation system and/or promote non-vehicular transportation as part of a development project or City initiated project.

Objective MT-2: **Make efficient use of the City's existing and proposed transportation system and strive to ensure the planning and provision of adequate resources to operate and maintain it.**

Policy MT-2-b: Reduce Vehicle Miles Traveled and Trips. Partner with major employers and other responsible agencies, such the San Joaquin Valley Air Pollution Control District and the Council of Fresno County Governments, to implement trip reduction strategies, such as eTRIP, to reduce total vehicle miles traveled and the total number of daily and peak hour vehicle trips, thereby making better use of the existing transportation system.

Policy MT-2-c: Reduce VMT through Infill Development. Provide incentives for infill development that would provide jobs and services closer to housing and multi-modal transportations corridors in order to reduce citywide vehicle miles travelled (VMT).

Policy MT-2-d: Street Redesign where Excess Capacity Exists. Evaluate opportunities to reduce right of way and/or redesign streets to support non-automobile travel modes along streets with excess roadway capacity where adjacent land use is not expected to change over the planning period.

Policy MT-2-e: Driveway and Access Consolidation. Take advantage of opportunities to consolidate driveways, access points, and curb cuts along designated major roadways when a change in development or a change in intensity occurs or when traffic operation or safety warrants.

Policy MT-2-f: Optimization of Roadway Operations. Optimize roadway operations by continuing to expand the use of techniques such as the City's intelligent transportation system (ITS) to manage traffic signal timing coordination in order to improve traffic operations and increase traffic-carrying capacity, while reducing unnecessary congestion and decreasing air pollution emissions. In order to facilitate roadway optimization and as a potential revenue source for the optimization, the following strategies need to be implemented:

- **Dig Once Policy.** Install conduit for telecommunications use when trenching or construction occurs.
- **Telecommunications Strategy.** Develop a costing mechanism for allowing the use of excess conduit within the City for use by communication carriers. The Policy shall follow regulations of the California Public Utilities Commission.
- **Grant Funding.** Pursue grant funding to assist in construction and/or implementation of fiber- optic or other telecommunication infrastructure for additional public services such as education, economic development, reaching underserved populations, and public safety communications.

Policy MT-2-g: Transportation Demand Management and Transportation System Management. Pursue implementation of Transportation Demand Management and Transportation System Management strategies to reduce peak hour vehicle traffic and supplement the capacity of the transportation system.

Policy MT-2-i: Transportation Impact Studies. Require a Transportation Impact Study (TIS) to assess the impacts of new development projects on existing and planned streets for projects meeting one or more of the following criteria, unless it is determined by the City Traffic Engineer that the project site and surrounding area already has appropriate multi-modal infrastructure improvements.

- When a project includes a General Plan amendment that changes the General Plan Land Use Designation.
- When the project will substantially change the off-site transportation system (auto, transit, bike or pedestrian) or connection to the system, as determined by the City Traffic Engineer.
- Transportation impact criteria are tiered based on a project's location within the City's Sphere of Influence. This is to assist with areas being incentivized for development. The four zones are listed below. The following criteria apply:
    - ***Traffic Impact Zone I (TIZ-I):*** TIZ-I represents the Downtown Planning Area. Maintain a peak hour LOS standard of F or better for all intersections and roadway segments. A TIS will be required for all development projected to generate 200 or more peak hour new vehicle trips.
    - ***Traffic Impact Zone II (TIZ-II):*** TIZ-II generally represents areas of the City currently built up and wanting to encourage infill development. Maintain a peak hour LOS standard of E or better for all intersections and roadway segments. A TIS will be required for all development projected to generate 200 or more peak hour new vehicle trips.
    - ***Traffic Impact Zone III (TIZ-III):*** TIZ-III generally represents areas near or outside the City Limits but within the SOI as of December 31, 2012. Maintain a peak hour LOS standard of D or better for all intersections and roadway segments. A TIS will be required for all development projected to generate 100 or more peak hour new vehicle trips.
    - ***Traffic Impact Zone IV (TIZ-IV):*** TIZ-IV represents the southern employment areas within and planned by the City. Maintain a peak hour LOS standard of E or better for all intersections and roadway segments. A TIS will be required for all development projected to generate 200 or more peak hour new vehicle trips.

Policy MT-2-l: Region-Wide Transportation Impact Fees. Continue to support the implementation of metropolitan-wide and region-wide transportation impact fees sufficient to cover the proportional share of a development's impacts and need for a comprehensive multi-modal transportation system that is not funded by other sources. Work with the Fresno Council of Governments, transportation agencies (e.g. Caltrans, Federal Transportation Agency) and other jurisdictions in the region to develop a method for determining:

- Regional transportation impacts of new development;
- Regional highways, streets, rail, trails, public transportation, and goods movement system components, consistent with the General Plan, necessary to mitigate those impacts and serve projected demands;
- Projected full lifetime costs of the regional transportation system components, including construction, operation, and maintenance; and
- Costs covered by established funding sources.

Bike and Pedestrians

Objective MT-4: **Establish and maintain a continuous, safe, and easily accessible bikeways system throughout the metropolitan area to reduce vehicle use, improve air quality and the quality of life, and provide public health benefits.**

Policy MT-4-b: Bikeway Improvements. Establish and implement property development standards to assure that projects adjacent to designated bikeways provide adequate right-of-way and that necessary improvements are constructed to implement the planned bikeway system to provide for bikeways, to the extent feasible, when existing roadways are reconstructed; and alternative bikeway alignments or routes where inadequate right-of-way is available.

Policy MT-4-d: Prioritization of Bikeway Improvements. Prioritize bikeway components that link existing separated sections of the system, or that are likely to serve the highest concentration of existing or potential cyclists, particularly in those neighborhoods with low vehicle ownership rates, or that are likely to serve destination areas with the highest demand such as schools, shopping areas, recreational and park areas, and employment centers.

Objective MT-5: **Establish a well-integrated network of pedestrian facilities to accommodate safe, convenient, practical, and inviting travel by walking, including for those with physical mobility and vision impairments.**

Policy MT-5-a: Sidewalk Development. Pursue funding and implement standards for development of sidewalks on public streets, with priority given to meeting the needs of persons with physical and vision limitations; providing safe routes to school; completing pedestrian improvements in established neighborhoods with lower vehicle ownership rates; or providing pedestrian access to public transportation routes.

Policy MT-5-b: Sidewalk Requirements. Assure adequate access for pedestrians and people with disabilities in new residential developments per adopted City policies, consistent with the California Building Code and the Americans with Disabilities Act.

Policy MT-5-d: Pedestrian Safety. Minimize vehicular and pedestrian conflicts on both major and non-roadways through implementation of traffic access design and control standards addressing street intersections, median island openings and access driveways to facilitate accessibility while reducing congestion and increasing safety. Increase safety and accessibility for pedestrians with vision disabilities through the installation of Accessible Pedestrian Signals at signalized intersections.

Policy MT-5-e: Traffic Management in Established Neighborhoods. Establish acceptable design and improvement standards and provide traffic planning assistance to established neighborhoods to identify practical traffic management and calming methods to enhance the pedestrian environment with costs equitably assigned to properties receiving the benefits or generating excessive vehicle traffic.

Objective MT-6: **Establish a network of multi-purpose pedestrian and bicycle paths, as well as limited access trails, to link residential areas to local and regional open spaces and recreation areas and urban Activity Centers in order to enhance Fresno's recreational amenities and alternative transportation options.**

Policy MT-6-g: Path and Trail Development. Require all projects to incorporate planned multi-purpose path and trail development standards and corridor linkages consistent with the General Plan, applicable law and case-by-case determinations as a condition of project approval.

Transit Service

Objective MT-8: **Provide public transit options that serve existing and future concentrations of residences, employment, recreation and civic uses and are feasible, efficient, safe, and minimize environmental impacts.**

> ***Commentary:*** *Public transit services must meet accessibility standards for individuals with disabilities as required by applicable state and federal regulations.*

Policy MT-8-a: Street Design Coordinated with Transit. Coordinate the planning, design, and construction of the major roadway network with transit operators to facilitate efficient direct transit routing throughout the Planning Area.

> ***Commentary:*** *Neighborhoods with circuitous and discontinuous streets are more difficult for public transit to serve efficiently than those with consistently spaced linear or semi-grid patterns.*

Policy MT-8-c: New Development Facilitating Transit. Continue to review development proposals in transportation corridors to ensure they are designed to facilitate transit. Coordinate all projects that have residential or employment densities suitable for transit services, so they are located along existing or planned transit corridors or that otherwise have the potential for transit orientation to FAX, and consider FAX's comments in decision-making.

Objective MT-11: **Achieve necessary capacity increasing and inter-modal connectivity enhancing improvements to the goods movement transportation system to support the growth in critical farm product and value added industries.**

> ***Commentary:*** *Connectivity enhancing improvements and strategies will be used to address necessary capacity and inter-modal connectivity.*

Policy MT-11-c: Truck Route Designations. Continue to plan and designate truck routes within the Metropolitan Area to facilitate access to and from goods production and processing areas while minimizing conflicts with other transportation priorities.

Air Quality and Greenhouse Gas Emissions

Objective RC-4: **In cooperation with other jurisdictions and agencies in the San Joaquin Valley Air Basin, take necessary actions to achieve and maintain compliance with State and federal air quality standards for criteria pollutants.**

> ***Commentary:*** *This includes compliance with California Government Code Section 65302.1 for the San Joaquin Valley.*

Policy RC-4-a: Support Regional Efforts. Support and lead, where appropriate, regional, State and federal programs and actions for the improvement of air quality, especially the SJVAPCD's efforts to monitor and control air pollutants from stationary and mobile sources and implement Reasonably Available Control Measures in the Ozone Attainment Plan.

> ***Commentary:*** *A list of Reasonably Available Control Measures was submitted by the SJVAPCD to the U.S. Environmental Protection Agency as part of the Ozone Attainment Plan designed to reduce ozone-forming emissions. The City is responsible for implementing measures related to operations and/or services that the City controls.*

San Joaquin Valley AIR POLLUTION CONTROL DISTRICT

Policy RC-4-b: Conditions of Approval. Develop and incorporate air quality maintenance requirements, compatible with Air Quality Attainment and Maintenance Plans, as conditions of approval for General plan amendments, community plans, Specific Plans, neighborhood plans, Concept Plans, and development proposals.

RC-4-e: Support Employer-Based Efforts. Support and promote employer implementation of staggered work hours and employee incentives to use carpools, public transit, and other measures to reduce vehicular use and traffic congestion.

RC-4-f: Municipal Operations and Fleet Actions. Continue to control and reduce air pollution emissions from vehicles owned by the City and municipal operations and facilities by undertaking and following:

- Expand the use of alternative fuel, electric, and hybrid vehicles in City fleets.
- Create preventive maintenance schedules that will ensure efficient engine operation.
- Include air conditioning recycling and charging stations in the City vehicle maintenance facilities to reduce Freon gas being released into the atmosphere and electrostatic filtering systems in City maintenance shop, when feasible or when required by health regulations.
- Use satellite corporation yards for decentralized storage and vehicle maintenance.
- Convert City-owned emergency backup generators to natural gas fuels whenever possible, and create an advanced energy storage system.

Policy RC-4-g: FAX Actions. Continue to improve Fresno Area Express (FAX) bus transit system technical performance, reduce emission levels, streamline system operations, and implement BRT where supportive land uses are proposed.

Policy RC-4-i: Methane Capture. Continue to pursue opportunities to reduce air pollution by using methane gas from old City landfill and the City's wastewater treatment process.

Policy RC-4-j: All Departments. Continue to develop and implement in all City departments, operational policies to reduce air pollution.

Objective RC-5: **In cooperation with other jurisdictions and agencies in the San Joaquin Valley Air Basin, take timely, necessary, and most cost effective actions to achieve and maintain reductions in greenhouse gas emissions and all strategies that reduce cause of climate change in order to limit and prevent the related potential detrimental effects upon public health and welfare of present and future residents of the Fresno community.**

Policy RC-5-a: Support State Goal to Reduce Statewide GHG Emissions. As is consistent with State law, strive to meet AB 32 goal to reduce greenhouse gas emissions to 1990 levels by 2020 and strive to meet a reduction of 80 percent below 1990 levels by 2050 as stated in the Executive

Order S-03-05. As new statewide GHG reduction targets and dates are set by the State update the City's Greenhouse Gas Reduction Plan to include a comprehensive strategy to achieve consistency with those targets by the dates established.

Policy RC-5-b: Greenhouse Gas Reduction Plan. As is consistent with State law, prepare and adopt a Greenhouse Gas Reduction Plan as part of the Master Environmental Impact Report to be concurrently approved with the Fresno General Plan in order to achieve compliance with State mandates, assist development by streamlining the approval process, and focus on feasible actions the City can take to minimize the adverse impacts of growth and development on global climate change. The Greenhouse Gas Reduction Plan shall include, but not be limited to:

- A baseline inventory of all known or reasonably discoverable sources of GHGs that currently exist in the city and sources that existed in 1990.
- A projected inventory of the GHGs that can reasonably be expected to be emitted from those sources in the year 2035 with implementation of this General Plan and foreseeable communitywide and municipal operations.
- A target for the reduction of emissions from those identified sources.
- A list of feasible GHG reduction measures to meet the reduction target, including energy conservation and "green building" requirements in municipal buildings and private development.
- Periodically update municipal and community-wide GHG emissions inventories to determine the efficacy of adopted measures and to guide future policy formulation needed to achieve and maintain GHG emissions reduction targets.

Policy RC-5-c: GHG Reduction through Design and Operations. Increase efforts to incorporate requirements for GHG emission reductions in land use entitlement decisions, facility design, and operational measures subject to City regulation through the following measures and strategies

- Promote the expansion of incentive-based programs that involve certification of projects for energy and water efficiency and resiliency. These certification programs and scoring systems may include public agency "Green" and conservation criteria, Energy Star™ certification, CALGreen Tier 1 or Tier 2, Leadership in Energy Efficient Design (LEED™) certification, etc.
- Promote appropriate energy and water conservation standards and facilitate mixed-use projects, new incentives for infill development, and the incorporation of mass transit, bicycle and pedestrian amenities into public and private projects.
- Require energy and water audits and upgrades for water conservation, energy efficiency, and mass transit, pedestrian, and bicycle amenities at the time of renovation, change in use, change in occupancy, and change in ownership for major projects meeting review thresholds specified in an implementing ordinance.
- Incorporate the City's "Guidelines for Ponding Basin/Pond Construction and Management to Control Mosquito Breeding" as conditions of approval for any project using an on-site storm water basin to prevent possible increases in vector-borne illnesses associated with global climate change.
- Periodically evaluate the City's facility maintenance practices to determine whether there are additional opportunities to reduce GHG's through facility cleaning and painting, park maintenance, road maintenance, and utility system maintenance.
- Periodically evaluate standards and mitigation strategies for highly vehicle-dependent land uses and facilities, such as drive-through facilities and auto-oriented development.

Active Transportation Plan

The *City of Fresno Active Transportation Plan*, adopted in 2016, serves as the Fresno's comprehensive guide to outlining the vision for active transportation. The ATP envisions a complete, safe, and comfortable network of trails, sidewalks, and bikeways that serves all residents of Fresno. The following goals that relate to pedestrian and bicycle mode share concerning the RTTAP study area are described herein.

Goal 1: **Equitably improve the safety and perceived safety of walking and bicycling in Fresno.**

Goal 2: **Increase walking and bicycling trips in Fresno by creating user-friendly facilities.**

Goal 3: **Improve the geographic equity of access to walking and bicycling facilities in Fresno.**

Goal 4: **Fill key gaps in Fresno's walking and bicycling networks.**

The Fresno City Council adopted the *Fresno General Plan* in December 2014. This plan establishes guidance for future planning in the City through 2035 and beyond. Nearly half of the *Fresno General Plan*'s 17 goals are related to bicycling and walking and are excerpted below.

Goal 4: **Emphasize achieving healthy air quality and reduced greenhouse gas emissions.**

Goal 7: **Provide for a diversity of districts, neighborhoods, housing types (including affordable housing), residential densities, job opportunities, recreation, open space, and educational venues that appeal to a broad range of people throughout the City.**

Goal 8: **Develop Complete Neighborhoods and districts with an efficient and diverse mix of residential densities, building types, and affordability which are designed to be healthy, attractive, and centered by schools, parks, and public and commercial services to provide a sense and that provide as many services as possible within walking distance.**

Intentionally plan for Complete Neighborhoods as an outcome and not a collection of subdivisions which do not result in Complete Neighborhoods.

Goal 11: **Emphasize and plan for all modes of travel on local and major streets in Fresno.**

Facilitate travel by walking, biking, transit, and motor vehicle with interconnected and linked neighborhoods, districts, major campuses and public facilities, shopping centers and other service centers, and regional transportation such as air, rail bus, and highways.

Goal 12: **Resolve existing public infrastructure and service deficiencies and make full use of existing infrastructure, and invest in improvements to increase competitiveness and promote economic growth.**

Emphasize the fair and necessary costs of maintaining sustainable water, sewer, and other public infrastructure and service systems in rates, fees, and financing and public investments to implement and General Plan. Adequately address accumulated deferred maintenance, aging infrastructure, risks to service community, desired standards of service to meet quality-of-life goals, and required infrastructure to support growth, economic competitiveness and business development.

Goal 14: **Provide a network of well-maintained parks, open spaces, athletic facilities, and walking and biking trails connecting the City's districts and neighborhoods to attract and retain a broad range of individuals, benefit the health or residents, and provide the level of public amenities required to encourage and support development of higher density urban living and transit use.**

Goal 16: **Protect and improve public health and safety.**

2.2 County of Fresno

2.2.1 General Plan

The *Fresno County General Plan Policy Document*, updated in 2000, provided relevant transportation and circulation element goals and policies that potentially affect the RTTAP study area.

Streets and Highways

The Fresno County Circulation System is a street and highway plan designed to provide for the safe and efficient movement of people and goods to and within the county and to ensure safe and continuous access to land. Using the State freeways and highways and the County's system of highways as its basic framework, the County Circulation System brings together the circulation plans of the cities and unincorporated communities within the county into a unified, functionally integrated, countywide system that is correlated with the Land Use Element of the General Plan.

Policies in this section seek to create a unified, coordinated, and cost-efficient countywide street and highway system by maintaining and rehabilitating existing roads, maintaining an acceptable level of service (LOS), coordinating improvements with other local jurisdictions, maintaining adequate funding, and providing multi-modal uses where appropriate along street and highway corridors.

Goal TR-A: To plan and provide a unified, coordinated, and cost-efficient countywide street and highway system that ensures the safe, orderly, and efficient movement of people and goods.

Policy TR-A.1: The County shall plan and construct County-maintained streets and roads according to the County's Roadway Design Standards. Roadway design standards for County-maintained roads shall be based on the American Association of State Highway and Transportation Officials (AASHTO) standards, and supplemented by California Department of Transportation (Caltrans) design standards and by County Public Works Department Standards. County standards include typical cross sections by roadway classification, consistent with right-of-way widths. The County may deviate from the adopted standards in circumstances where conditions warrant special treatment of the roadway. Typical circumstances where exceptions may be warranted may include:

- Extraordinary construction costs due to terrain, roadside development, or unusual right-of-way needs; and
- Environmental constraints that may otherwise entirely preclude road improvement.

Policy TR-A.2: The County shall plan and design its roadway system in a manner that strives to meet Level of Service (LOS) D on urban roadways within the spheres of influence of the cities of Fresno and Clovis and LOS C on all other roadways in the county. Roadway improvements to increase capacity and maintain LOS standards should be planned and programmed based on

consideration of the total overall needs of the roadway system, recognizing the priority of maintenance, rehabilitation, and operation of the existing road system.

The County may, in programming capacity-increasing projects, allow exceptions to the level of service standards in this policy where it finds that the improvements or other measures required to achieve the LOS policy are unacceptable based on established criteria. In addition to consideration of the total overall needs of the roadway system, the County shall consider the following factors:

- The right-of-way needs and the physical impacts on surrounding properties;
- Construction and right-of-way acquisition costs;
- The number of hours that the roadway would operate at conditions below the standard;
- The ability of the required improvement to significantly reduce delay and improve traffic operations; and
- Environmental impacts upon which the County may base findings to allow an exceedance of the standards.

In no case should the County plan for worse than LOS D on rural County roadways, worse than LOS E on urban roadways within the spheres of influence of the cities of Fresno and Clovis, or in cooperation with Caltrans and the Council of Fresno Count r worse than LOS E on State highways in the county.

Policy TR-A.4: The County shall program road improvements on a countywide priority basis using technical assessment tools such as Road and Traffic Evaluation (RATE) and Pavement Management System (PMS).

Policy TR-A.5: The County shall require dedication of right-of-way or dedication and construction of planned road facilities as a condition of land development, and require an analysis of impacts of traffic from all land development projects including impacts from truck traffic. Each such project shall construct or fund improvements necessary to mitigate the effects of traffic from the project. The County may allow a project to fund a fair share of improvements that provide significant benefit to others through traffic impact fees.

https://www.co.fresno.ca.us/

Policy TR-A.6: The County shall continue to participate with the Council of Fresno County Governments, the California Department of Transportation, and other agencies, to maintain a current Regional Transportation Plan, and to identify funding priorities and development expenditure plans for available regional transportation funds, in accordance with regional, State, and Federal transportation planning and programming procedures. Such regional programming may include improvements to State highways, City streets, and County roadways.

Policy TR-A.7: The County shall assess fees on new development sufficient to cover the fair share portion of that development's impacts on the local and regional transportation system.

Policy TR-A.10: The County shall seek all possible financial assistance, including grant funds available from regional, State, and Federal agencies for street and highway purposes when compatible with General Plan policies and long-term local funding capabilities.

Policy TR-A.11: The County shall ensure that funds allocated directly or are otherwise available to

the County for road fund uses shall be programmed and expended to maximize the use of Federal and other matching funds, and shall be based on the following sequence of priorities:

- Maintenance, rehabilitation, reconstruction, and operation of the existing County-maintained road system;
- Safety improvements where physical modifications or capital improvements would reduce the number and/or severity of accidents; and
- Capital capacity improvements to expand capacity or reduce congestion on roadways at or below County LOS standards, and to expand the roadway network.

Policy TR-A.12: The County, where appropriate, shall coordinate the multi-modal use of streets and highways to ensure their maximum efficiency and shall consider the need for transit, bikeway, and recreational trail facilities when establishing the Ultimate Right-of-way Plan and Precise Plans of streets and highways.

Policy TR-A.13: The County shall develop and maintain a program to construct bikeways and recreation trails in conjunction with roadway projects in accordance with the adopted Regional Bikeways Plan, the adopted Recreation Trails Plan, available dedicated funding for construction and maintenance, and a needs priority system.

Policy TR-A.14: The County shall work with the cities of Fresno County in establishing a system of designated truck routes through urban areas.

Policy TR-A.16: The County shall require that plans for County road improvement projects consider the preservation of unique existing landscaping to the extent that it will be consistent with user safety.

Policy TR-A.17: The County should utilize road construction methods that minimize air, water, and noise pollution associated with street and highway development.

Policy TR-A.19: The County may identify locations of needed future road rights-of-way, consistent with adopted functional classifications, through development and adoption of specific plan lines where appropriate. Circumstances where specific plan line development may be considered may include the following:

- Where major classified roadways or corridors are expected to require additional through lanes within a 20-year planning horizon;
- Where the future alignment is expected to deviate from the existing alignment, or to be developed asymmetrically about the existing section or center line;
- Where the adjacent properties are substantially undeveloped, so that property owners may benefit from prior knowledge of the location of rights-of-way of planned roadways before constructing improvements or developing property in a way which may ultimately conflict with identified transportation needs; and
- Expressways and associated frontage roads.

Transit

Transit systems—both buses and rail—provide alternatives to automobile use and are especially important for those who cannot or do not drive. As Fresno County grows, the potential for transit use and the need for transit will increase. The General Plan supports expansion of the existing transit system, especially in connection with new development.

Policies in this section seek to develop a safe and efficient mass transit system by promoting transit services within urban corridors of dense population and employment, addressing user needs (i.e., seniors, minority, handicapped), developing convenient transfers between transportation systems, and ensuring adequate funding for the system.

Goal TR-B: To promote a safe and efficient mass transit system that provides service to residents without access to automobiles and, in urban areas, helps to reduce congestion, improves the environment, and provides viable non-automotive means of transportation.

Policy TR-B.1: The County shall work with transit providers to provide transit services within the county that are responsive to existing and future demand and that can demonstrate cost-effectiveness by meeting minimum farebox recovery levels of required by State and Federal funding programs.

Policy TR-B.2: The County shall promote transit services in designated corridors where population and employment densities are sufficient or could be increase to support those transit services, particularly within the spheres of influence of the cities and along existing transit corridors in the rural area of the county.

Policy TR-B.3: The County shall work with the Cities of Fresno and Clovis and other agencies to achieve land use patterns and densities in areas planned foe development and support transit services, preserve adequate rights-of-way, and enhance transit services in the designated transit corridors.

Policy TR-B.4: The County shall work with the Council of Fresno County Governments and transit service providers to pursue all available sources of funding for transit services when consistent with General Plan policies and long-term funding capabilities.

Policy TR-B.5: The County shall consider the transit needs of senior, disabled, low-income, and transit-dependent persons in making recommendations regarding transit services.

Policy TR-B.6: The County shall encourage the development of facilities for convenient transfers between transportation systems (e.g., train-to-bus, bus-to-bus).

Transportation Systems Management

Fresno County has a relatively complex highway transportation system, serving cars, heavy trucks, agricultural and commercial vehicles, buses, transit, bicycles, and pedestrian traffic. Coordinating these many forms of transportation is critical to achieving maximum road efficiency and minimizing costly road expansion or construction.

Policies in this section seek to reduce travel demand on the county's roadway system and maximize the operating efficiency of transportation facilities. The intent is to reduce vehicle emissions and reduce the needed investment in new or expanded facilities. In rural areas, transportation management can sometimes be better addressed through development location and access management rather than conventional systems management.

Goal TR-C: To reduce travel demand on the County's roadway system and maximize the operating efficiency of transportation facilities so as to reduce the quantity of motor vehicle emissions and reduce the amount of investment required in new or expanded facilities.

Policy TR-C.1: The County shall support all standards and regulations adopted by the San Joaquin Valley Air Pollution Control District (SJVAPCD) governing transportation control measures (TCMs).

Policy TR-C.2: The County shall consider transportation system management (TSM) measures to increase the capacity of existing roadway network prior to constructing new traffic lanes. Such measures may include traffic signal synchronization and additional turning lanes.

Policy TR-C.3: The County shall work with the Cities of Fresno and Clovis to encourage new urban development within the FCMA to provide appropriate on-site facilities that encourage employees to use alternative transportation modes as air quality and transportation mitigation measures. The type of facilities may include bicycle parking, shower and locker facilities, and convenient access to transit, depending on the development size and location.

Bicycle Facilities

The bicycle has steadily been gaining in acceptance and importance in recent years as a means of recreation, transportation, and healthful exercise. The extent of this increase is reflected in the dramatic rise of bicycle sales. This use of the bicycle by a growing segment of the public has generated an interest in the need for adequate facilities for cyclists. Policies in this section seek to provide a safe, continuous, and easily accessible bikeway system that connects cities to other communities, to major facilities, and to recreational areas and regional parks; these policies also strive to establish bikeways along existing recreational bicycling routes, to encourage safety-oriented design, to link bikeways to other modes of transportation, and to provide adequate funding.

Bicycle Master Plan: https://www.co.fresno.ca.us

Goal TR-D: To plan and provide safe, continuous, and easily assessable bikeway system that facilitates the use of the bicycle as a viable alternative transportation mode and as a form or recreation and exercise.

Policy TR-D.1: The County shall implement a system of recreational, commuter, and inter-community bicycle routes in accordance with the Regional Bikeway Plan. The plan designates bikeways between cities and unincorporated communities, to and near major traffic generators such as recreational areas, parks of regional significance, and other major public facilities, and along recreational routes.

Policy TR-D.2: The County shall give priority to bikeways that will serve the most cyclists and destinations of greatest demand and to bikeways that close gaps in the existing system.

Policy TR-D.3: The County shall implement Regional Bikeways Plan routes as Class II facilities unless otherwise designated.

Policy TR-D.4: The County shall develop bikeways in conjunction with street improvement projects occurring along streets and roads designated on the Regional Bikeways Plan map.

Policy TR-D.5: The County shall require that adequate rights-of-way or easements are provided for designated bikeways or trails as a condition of land development.

Policy TR-D.6: The County should promote bicycle safety programs through education and awareness programs aimed at both cyclists and motorists.

Policy TR-D.7: The County shall construct and maintain bikeways to minimize conflicts between bicyclists and motorists.

Policy TR-D.8: The County shall support development of facilities that help link bicycling with

other modes of transportation.

Rail Transportation

Rail transportation has played an important historical role in the development of the county. Currently, the County's role in rail transportation is limited primarily to land use regulation through the Zoning Ordinance. Federal and State agencies have primary jurisdiction over rail facilities and operations.

Policies in this section seek to provide a safe, efficient, and environmentally-sound rail system by supporting improvements to at-grade crossings, protecting and supporting acquisition of railroad rights-of-way, and developing multi-model stations that link rail with other transportation modes.

Goal TR-E: To plan for a safe, efficient, and environmentally-sound rail system to meet the needs of all Fresno County residents, industry, commerce, and agriculture.

Policy TR-E.1: The County supports consolidation of the Burlington Northern Santa Fe main line traffic onto the Union Pacific right-of-way from Calwa to the San Joaquin River.

Policy TR-E.2: The County shall support improvements to at-grade crossings on the Burlington Northern Santa Fe and Union Pacific mainline and spur or branch line tracks within the county.

Policy TR-E.3: The County shall support acquisition by local agencies of railroad rights-of-way that are: 1) in designated transit corridors; and 2) required for public health, safety, and welfare.

Policy TR-E.4: The County shall work cooperatively with the railroads on the long-term protection of railroad rights-of-way.

Policy TR-E.5: The County shall support multi-modal stations at appropriate locations to integrate rail transportation with other transportation modes.

Policy TR-E.6: The County shall support the development of a statewide high-speed rail service through the Central Valley that serves downtown Fresno and that parallels the Burlington Northern Santa Fe corridor south of the City of Fresno, the Union Pacific corridor through the City of Fresno, and is capable of accommodating the rapid movement of freight during nighttime, non-passenger usage hours.

Air Transportation

Air transportation plays a key role in the movement of goods and people not only to locations outside of the county but also between locations within the county. Currently, the County's role in air transportation is strictly limited to land use regulation through the Zoning Ordinance. State and Federal agencies have primary jurisdiction over airport facilities and operations. There is no air transportation facilities that will affect the RTTAP study area. Turner Field is approximately 0.5 miles away from the study area. D &D Aircraft Services, Fresno Chandler Executive Airport, and Chandler NDB FCH 344 are all located approximately 3.0 miles northwest of the RTTAP area.

Active Transportation Plan

Similar to the *City of Fresno Active Transportation Plan*, the *Fresno County Regional Active Transportation Plan* also serves as the Fresno's comprehensive guide to outlining the vision for active transportation. The Fresno Regional ATP is an important document that will help each jurisdiction in the County identify needed bicycle and pedestrian projects and help the agencies qualify for new funds to implement the projects. It is important that the Plan be context sensitive to local needs and vetted with local staff and the community. The Regional ATP was adopted by the Fresno COG Policy Board February 22, 2018. Some goals of the Fresno Regional ATP include:

City of Fresno Active Transportation Plan (2016)

> ***Goal 1:* Create a network of safe and attractive trails, sidewalks, and bikeways that connect Fresno County residents to key destinations, especially local schools and parks;**
>
> ***Goal 2:* Create a network of regional bikeways that allows bicyclists to safely ride between cities and other regional destinations;**
>
> ***Goal 3:* Increase walking and bicycling trips in the region by creating user-friendly facilities; and**
>
> ***Goal 4:* Increase safety by creating bicycle facilities and improving crosswalks and sidewalks for pedestrians.**

Fresno County also incorporated goals and policies of relevant bicycle and pedestrian planning considering unincorporated Fresno County communities. The status and plan information is relevant to the entire county, including incorporated and unincorporated areas. The following County goals are relevant to Regional Bicycle & Recreational Trails Master Plan (BRTMP) within the RTAAP study area. Transportation and Circulation Element goals and relevant policies relating to bicycling and walking has been listed above within the *Fresno County General Plan Policy Document* (TR-C and TR-D) are also listed below.

> ***Goal BP-A: Develop a safe and convenient, interregional system of bikeways throughout Fresno County.***
>
> ***Goal BP-B: Promote bicycling as an alternate form of transportation and integrate bicycling with other forms of transportation, including public transit to major destination areas.***
>
> ***Goal BP-C: Increase Fresno County bicycle transportation in urban areas so that the number of bicycle commuter trips doubles by the year 2035.***
>
> ***Goal BP-D: Improve bicycling safety, reduce bicycle-related collisions, establish educational opportunities aimed at all levels of bicyclists, and promote safer driving behaviors among cyclists and motorists.***
>
> ***Goal BP-E: Develop and fund a bicycle program at the County and budget to implement improvements.***
>
> *The plan estimated that there were 90 bicycle parking locations in the county. Rural bicycle parking locations are primarily at educational facilities. A few bicycle parking racks, located along popular rural bike routes, have been donated by local bicycle clubs.*

Transportation and Circulation Element

Goal TR-D: To plan and provide a safe, continuous, and easily accessible bikeway system that facilitates the use of the bicycle as a viable alternative transportation mode and as a form of recreation and exercise.

Policy TR-C.3: The County shall work with the Cities of Fresno and Clovis to encourage new urban development within the FCMA to provide appropriate on-site facilities that encourage employees to use alternative transportation modes as air quality and transportation mitigation measures. The type of facilities may include bicycle parking, shower and locker facilities, and convenient access to transit, depending on the development size and location.

Policy TR-D.1: The County shall implement a system of recreational, commuter, and intercommunity bicycle routes in accordance with the Regional Bikeway Plan. The plan designates bikeways between cities and unincorporated communities, to and near major traffic generators such as recreational areas, parks of regional significance, and other major public facilities, and along recreational routes.

Policy T R-D.2: The County shall give priority to bikeways that will serve the most cyclists and destinations of greatest demand and to bikeways that close gaps in the existing system.

Policy T R-D.3: The County shall implement Regional Bikeways Plan routes as Class II facilities unless otherwise designated.

Policy T R-D.4: The County shall develop bikeways in conjunction with street improvement projects occurring along streets and roads designated on the Regional Bikeways Plan map.

Policy T R-D.5: The County shall require that adequate rights-of-way or easements are provided for designated bikeways or trails as a condition of land development.

Policy T R-D.6: The County should promote bicycle safety programs through education and awareness programs aimed at both cyclists and motorists.

Policy T R-D.7: The County shall construct and maintain bikeways to minimize conflicts between bicyclists and motorists.

Policy T R-D.8: The County shall support development of facilities that help link bicycling with other modes of transportation.

Regional Bicycle & Recreational Trails Master Plan (2013)

Goal BP-A: Develop a safe and convenient, interregional system of bikeways throughout Fresno County.

Goal BP-B: Promote bicycling as an alternate form of transportation and integrate bicycling with other forms of transportation, including public transit to major destination areas.

Goal BP-C: Increase Fresno County bicycle transportation in urban areas so that the number of bicycle commuter trips doubles by the year 2035.

Goal BP-D: Improve bicycling safety, reduce bicycle-related collisions, establish educational opportunities aimed at all levels of bicyclists, and promote safer driving behaviors among cyclists and motorists.

Goal BP-E: Develop and fund a bicycle program at the County and budget to implement

improvements.

The Fresno County Regional Active Transportation Plan meets all requirements for active transportation plans as a specified by the California Transportation Commission's 2017 Active Transportation Program Guidelines. Goals and policies of the program are described below.

2.3 Fresno Council of Governments

The Active Transportation Program[1] (ATP) was created by Senate Bill 99 (Chapter 359, Statutes of 2013) and Assembly Bill 101 (Chapter 354, Statutes of 2013) to encourage increased use of active modes of transportation, such as biking and walking. The ATP consolidates various federal and state programs, including Transportation Alternatives Program, Bicycle Transportation Account, and State Safe Routes to School, into a single program with a focus to make California a national leader in active transportation. The program was originally funded at about $123 million a year from a combination of state and federal funds. Most recently, Road Repair and Accountability Act of 2017 Senate Bill 1 (Chapter 20, Statutes of 2017) added approximately $100 million per year in available funds for ATP. This will nearly double the amount of available funds for the Active Transportation Program.

The ATP is funded from various federal and state funds appropriated in the annual Budget Act. These are:

- 100% if the federal Transportation Alternative Program funds, except for federal Recreation Trail Program funds appropriated to the Department of Parks and Recreation.
- $21 million of federal Highway Safety Improvement program funds or other federal funds.
- State Highway Account funds.
- Road Maintenance and Rehabilitation Account (SB 1).

In addition to furthering the purpose and goals of this program, all ATP projects must meet eligibility requirements specific to at least one ATP funding source. The following goals of the program that are relevant to the RTTAP study, as follows:

Goal 1: Increase the proportion of trips accomplished by biking and walking.

Goal 2: Increase the safety and mobility of non-motorized users.

Goal 3: Advance the active transportation efforts of regional agencies to achieve greenhouse gas reduction goals as established pursuant to Senate Bill 375 (Chapter 728, Statutes of 2008) and Senate Bill 391 (Chapter 585, Statutes of 2009).

Goal 4: Enhance public health, including reduction of childhood obesity through the use of programs including, but not limited to, projects eligible for Safe Routes to School Program funding.

[1] *Fresno COG Cycle 4 2019 Regional Competitive Active Transportation Program, Approved by the California Transportation Commission in August 2018*

Goal 5: Ensure that disadvantaged communities fully share in the benefits of the program.

Goal 6: Provide a broad spectrum of projects to benefit many types of active transportation users.

2.4 Fresno Area Express

FAX's ability to deliver transit service will be impacted by laws, regulations, and policy decisions of several external agencies[2]. These agencies include: the Federal Transit Administration (FTA), the State of California Transportation Department (CALTRANS), the Fresno Council of Governments (Fresno COG), Fresno County, the City of Clovis, the Fresno County Rural Transit Agency (FCRTA), the Consolidated Transportation Service Agencies (CTSA), and various private transportation operators. The adopted FAX Policy Directions illustrates relevant goals and policies used to provide the framework for developing a sound public transportation system throughout Fresno County.

Goal 1: Provide public transportation mobility opportunities to the maximum number of people in the region

Policy 1.1: Provide a transit system that meets the public transportation needs of the service area.

Policy 1.2: Provide transit system that serve low income, elderly, and disabled communities.

Goal 2: Provide quality, convenient and reliable public transportation service.

Policy 2.1: Provide reliable and convenient public transit service.

Policy 2.2: Provide clean, attractive and comfortable vehicles and facilities.

Policy 2.3: Provide a safe system.

Goal 3: Provide an efficient and effective public transportation system.

Policy 3.1: Maximize public transportation patronage.

Policy 3.2: Minimize operating and capital expenses.

Goal 4: Provide for an integrated multimodal transportation system which facilitates the movement of people and goods.

Policy 4.1: Coordinate service to facilitate multimodal and inter-system transfers.

Policy 4.2: Coordinate fare and transfer policies along with service information programs.

Goal 5: Coordinate public transportation policies and land use and air quality policies.

Policy 5.1: Provide incentives to reduce dependency on automobile travel without compromising

travel mobility.

Policy 5.2: Evaluate the transportation system for air quality, energy and efficiency impacts.

The following FAX strategic plan consists of goals, objectives and standards that reflects FAX's transit specific performance target that would influence the RTTAP study area.

Goal 1: Service Levels. FAX will provide transportation service to a maximum number of people in the Fresno-Clovis Metropolitan Area (FCMA).

Objective A: To provide a transit system that meets the public transportation needs of the service area.

Standard 1: FAX's fixed-route bus should be designed so that a minimum of 90% of the service area population resides within one-half mile of a bus route.

Standard 2: FAX scheduled service should provide for maximum headways of 60 minutes on every route whenever service is operated.

Standard 3: FAX should meet the demand for public transit service, at some level, seven days a week.

Objective B: To provide a transit service (both fixed-route and demand-responsive) that adequately serves the elderly and disabled population.

Standard 1: FAX should remain fixed-route fare levels for elderly and disabled persons no higher than one half the base fare.

Standard 2: All wheelchair lifts should be operable at all times.

Standard 3: FAX will continue to operate Handy Ride demand-response service in compliance with the requirements of the Americans with Disabilities Act of 1990.

Objective C: To secure a stable and sufficient loading funding mechanism.

Standard 1: FAX should identify and coordinate funding mechanisms that will address all transportation funding needs in the Fresno Clovis Metropolitan Area.

Standard 2: FAX should identify short and long range funding needs, and maximize revenue resources utilizing all funding mechanisms including federal grants, developer impact fees, State enabling legislation and farebox revenue.

Goal 2: Service Quality. FAX will provide a quality, convenient and reliable service.

Objective A: To provide reliable and convenient public transit service.

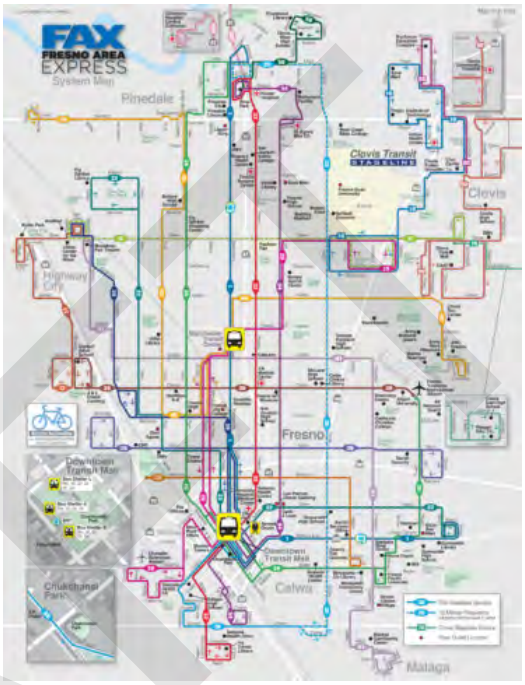
Standard 1: FAX should operate its fixed route buses so that on time performance is achieved at least 85% of the time. A bus is considered "on time" if it leaves no more than five minutes after the scheduled departure time.

Standard 2: FAX should complete 99.5% of all scheduled trips.

Objective C: To provide a safe system.

Standard 1: FAX buses should, at a minimum operate in excess of 100,000 miles between preventable accidents, and bus operators should be formally recognized for their safe driving.

Standard 2: Buses should be checked daily for proper operation and condition of lights, mirrors, radios and fluid. Detailed mechanical inspections should be done every 1,000 miles. Operations, Maintenance and other employees will be provided safety training at the beginning of their employment and such training will be updated on a regularly scheduled basis.



https://www.fresno.gov/transportation/fax/routes/

Standard 3: FAX should continue to implement a security program.

Objective D: To record and respond to all public comments.

Standard 1: FAX will continue to track, evaluate, and follow up to all compliments, complaints and inquiries from the public.

Goal 3: Provide Efficient and Effective Service. FAX will operate an efficient and effective bus system.

Objective A: To establish and maintain system-wide productivity indicators.

Standard 1: FAX should achieve 24% farebox recovery ratio.

Standard 2: FAX should achieve a system wide standard of 35 boardings per revenue hour system wide.

Standard 3: FAX should record and report at least, monthly, the following performance indicators:

- Total Monthly Ridership
- Total Monthly Revenue
- Total Monthly Expenses
- Total Revenue Hours
- Total Revenue Miles
- Farebox Ratio
- Total Operating Expense per Passenger
- Total Operating Expenses per Revenue Hour
- Total Revenue per Revenue Hour
- Total Operating Expense per Revenue Mile
- Total Revenue per Revenue Mile
- Passenger per Revenue Hour
- Passengers per Revenue Mile
- Average Weekday Ridership
- Average Saturday Ridership
- Average Sunday Ridership
- Percentage of Scheduled Trips Completed
- Percentage of Trips on Time
- Total Road Calls

Goal 4: System Image. FAX will promote its service and image in the community and at large.

Objective A: To maintain an active marketing program.

Standard 1: FAX should stress the positive impact of its operation in the community through press releases, speeches and involvement in community activities.

Standard 2: FAX should become involved in and work with citizens' groups, the Chamber of Commerce, the Downtown Association and other area merchant associations to communicate its services and benefits both to local residents as part of a broader marketing strategy to attract new residents in Fresno who would want to live in a TOD environment.

Standard 3: FAX should maintain public outreach programs with area employers to promote transit, carpooling and riding programs.

Objective B: To provide complete and accurate public transit information.

Standard 1: Current bus schedules and system information should be available to the public at all major public facilities, trip generators and transfer points.

Standard 2: Service information should be available by telephone to the public at all times.

Standard 3: FAX will actively seeks out and engage members of Fresno's minority, low income and Limited English speaking populations to listen to their needs and provide meaningful information to them about use of the transit system.

Goal 5: Private Sector and Citizen Involvement. FAX will provide opportunities for citizens and private business to participate in public transportation operations.

Objective A: To provide opportunities for citizens input into FAX's operations.

Standard 1: FAX will hold public hearings, as required by the federal government;

(a) When there is a change in any fare, except promotional fare changes for up to 180 days.

(b) When there is a service change leading to a 25 percent or greater change in total revenue service miles.

https://www.onmenews.com/single-post/2018/07/02/City-of-Fresno-approves-FAX-Pilot-Program-to-serve-Inspiration-Park

Standard 2: FAX will coordinate and cooperate with the Fresno Council of Governments (Fresno COG) in its annual "unmet transit needs" process, including participation in the Fresno COG Social Services Transportation Advisory Council (SSTAC) meetings and Public Hearing.

Goal 6: Integrated Multi-Modal Transportation. FAX will provide an integrated multi-modal transportation system which facilitates the movement of people.

Objective A: Develop a multi-modal transportation network.

Standard 1: FAX will provide transit service to all airport and passenger rail facilities in the FCMA.

Goal 7: Coordinate Transportation, Land Use, and Air Quality Policies

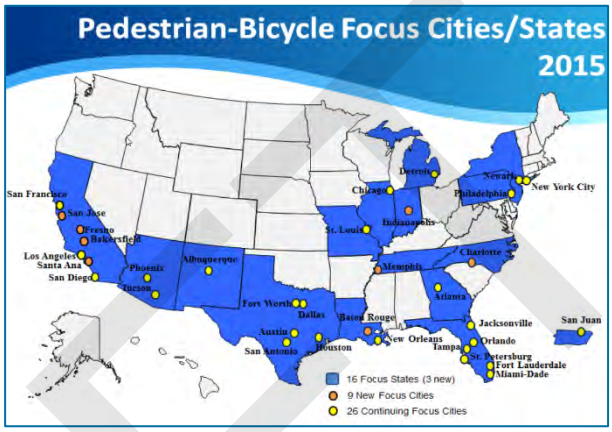
Objective A: Support transportation investments that work toward accomplishing air quality goals, optimize utilization of land and encourage a stable economic base.

Standard 1: Evaluate FAX system for air quality, energy, and efficiency impacts.

Standard 2: FAX will coordinate with City, County, and Regional Agencies to promote efficient "Smart Growth" land use and transportation policy integration.

1. Study Collisions

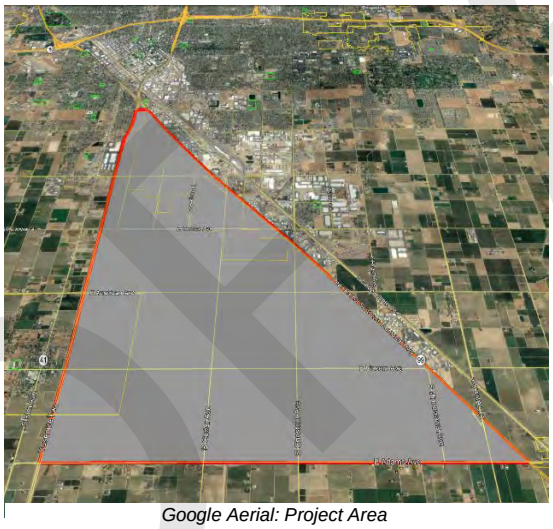
The U.S. Department of Transportation Federal Highway Administration (FHWA) has been working aggressively to reduce pedestrian and bicyclist deaths. As part of the efforts, FHWA identified Pedestrian-Bicycle Focus Cities/States in 2015 (last modified on April 1, 2019) that were selected based on their high pedestrian and bicycle fatality rates. Fresno was one of the new focus cities listed in California as shown in the map (to the right).



FHWA Resource

Additionally, improving the safety of pedestrians (walking) and bicycling in Fresno is one of the main goals of the Fresno Active Transportation Plan (ATP). Therefore, keeping with the ATP, the RTTAP also strives to improve the safety of walking and bicycling in and around the study area.

1.1 Total Collisions



Google Aerial: Project Area

The study area encompasses approximately 15 square miles, bordering Highway 41, State Route 99, Adams Avenue and Chestnut Avenue. Refer to Study Area Google aerial. Based upon data collected from the Transportation Injury Mapping System (TIMS), Table 1.1 and Figure 1.1 identify total collisions by severity for the study area from 2012-2017. As noted in Table 1.1, there were 307 total collisions. Table 1.2 and Figure 1.2 further breakdown the collisions by the primary collision factor (PCF). As noted in Table 1.2, automobile right of way consisted of the majority of collisions (40%), followed by unsafe speed (15%), improper turning (13%) and traffic signal and signs (13%).

Table 1.1: Collisions by Severity Type (2012-2017)

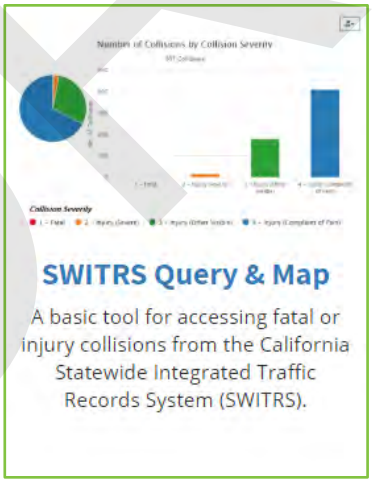
Year	Injury (Complaint of Pain)	Injury (Other Visible)	Injury (Severe)	Fatality
2012	32	17	4	1
2013	25	11	2	2
2014	34	20	9	
2015	35	21	5	2
2016	28	10	2	
2017	26	15	6	
Total	**180**	**94**	**28**	**5**
				Overall Total Collisions = 307

Source: SWITRS, TIMS (2012-2017)

Table 1.2: Primary Collision Factors (2012-2017)

PCF Collision Type	# of Collisions	PCF Collision Type	# of Collisions
Unknown	5	Automobile Right of Way	124
Driving or Bicycling Under the Influence	25	Pedestrian Right of Way	1
Impeding Traffic	1	Pedestrian Violation	4
Unsafe Speed	43	Traffic Signal and Signs	40
Wrong Side of Road	7	Other Hazardous Violations	3
Improper Passing	3	Other than Driver (or Pedestrian)	2
Unsafe Lane Change	4	Unsafe Starting and Backing	2
Improper Turning	41	Other	2

Source: SWITRS, TIMS (2012-2017)



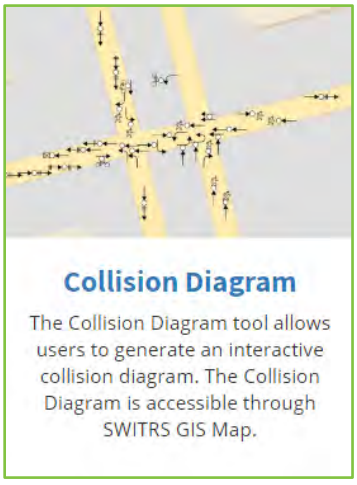


FIGURE 1.1

CITY OF FRESNO

41

99

Church Ave

CALWA

Jensen Ave

Clovis Ave

North Ave

Muscat Ave

MALAGA

Central Ave

Malaga Ave

Minnewawa Ave

American Ave

Jefferson Ave

EASTON

Lincoln Ave

Clayton Ave

Adams Ave

Sumner Ave

Elm Ave

Cherry Ave

East Ave

Orange Ave

Cedar Ave

Maple Ave

Chestnut Ave

Willow Ave

Peach Ave

Villa Ave

Kenneth Ave

FOWLER

Fresno County

Study Area

Fatal	[5]	Fresno County	Fire Station #89
Injury (Severe)	[28]	City of Fresno (city limits)	Cherry Avenue Auction
Injury (Other Visible)	[94]	HSR_Maintenance Facility	Orange Elementary
Injury (Complaint of Pain)	[180]	Triangle Industrial Study Area	Ulta Dist. Center
			Amazon Dist. Center

N

0 0.25 0.5 0.75 1

Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

2012-2017
Collision Severity Map

Project No. 11192258

Date 6/12/2019

Fresno Council of Governments

GHD

L:\Prj\2618\G2618\Maps\Working\Collisions 2012-2017 (11x17).mxd
Print date: 17 Jun 2019 - 07:30

Paper Size ANSI B (portrait)

Data source: GHD 2019, TIMS Public GIS data (collisions), Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

FIGURE 1.2

CITY OF FRESNO

99

41

Church Ave

CALWA

Jensen Ave

Clovis Ave

North Ave

Muscat Ave

MALAGA

Central Ave

Malaga Ave

Minnewawa Ave

American Ave

Jefferson Ave

EASTON

Lincoln Ave

Clayton Ave

Adams Ave

99

Sumner Ave

Elm Ave

41

Cherry Ave

East Ave

Orange Ave

Cedar Ave

Maple Ave

Chestnut Ave

Willow Ave

Peach Ave

Villa Ave

Kenneth Ave

FOWLER

Fresno County

Study Area

- Unknown [5]
- Driving or Bicycling Under the Influence [25]
- Impeding Traffic [1]
- Unsafe Speed [43]
- Wrong Side of Road [7]
- Improper Passing [3]
- Unsafe Lane Change [4]
- Improper Turning [41]
- Automobile Right of Way [124]
- Pedestrian Right of Way [1]
- Pedestrian Violation [4]
- Traffic Signal and Signs [40]
- Other Hazardous Violations [3]
- Other than Driver (or Pedestrian) [2]
- Unsafe Starting or Backing [2]
- Fresno County
- City of Fresno (city limits)
- HSR_Maintenance Facility
- Triangle Industrial Study Area
- Fire Station #89
- Cherry Avenue Auction
- Orange Elementary
- Ulta Dist. Center
- Amazon Dist. Center

N

0 0.25 0.5 0.75 1

Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

2012-2017
Primary Collision Factor Map

Project No. 11192258

Date 6/12/2019

Fresno Council of Governments

GHD

L:\Prj\2618\G2618\Maps\Working\Collisions_PCF-VIOL-CATEGORY (2012-2017).mxd
Print date: 17 Jun 2019 - 14:33

Paper Size ANSI B (portrait)

Data source: GHD 2019, TIMS Public GIS data (collisions), Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

1.2 Pedestrian and Bicycle Collisions

In terms of pedestrian and bicyclist collisions, the data presented in Table 1.1 filters out pedestrian and bicyclist collision by severity types within the 5-year period between 2012-2017. Table 1.3 shows pedestrian collisions by severity type and Table 1.4 identifies bicycle collisions by severity type. Figure 1.3 identifies pedestrian and bicycle collisions by severity type and the location of collision.

Crashstats.nhtsa.dot.gov

Table 1.3: Pedestrian Collisions by Severity Type (2012-2017)

Year	Injury (Complaint of Pain)	Injury (Other Visible)	Injury (Severe)	Fatality
2012		1		1
2013		1		
2014			4	
2015		1	1	
2016				
2017				

Source: SWITRS, TIMS (2012-2017)

As noted in Table 1.3, there were nine collisions involving a pedestrian, or 3 percent of the total collisions that recorded. Of the nine collisions there was one fatality recorded during that period.

Table 1.4: Bicyclist Collisions by Severity Type (2012-2017)

Year	Injury (Complaint of Pain)	Injury (Other Visible)	Injury (Severe)	Fatality
2012				
2013	1	1		1
2014	1			
2015		2		
2016				
2017	1		1	

Source: SWITRS, TIMS (2012-2017)

As noted in Table 1.4, there were eight collisions involving a bicyclist, or approximately 3 percent of the total collisions that documented. Of the eight collisions, there was one fatality recorded during that period. In total, approximately 6 percent of the total collisions logged involved a pedestrian and bicyclist.

The collision data collected for existing conditions will be used when considering future design and operations of potential transportation improvements that will be identified as part the RTTAP.

Crashstats.nhtsa.dot.gov

FIGURE 1.3

CITY OF FRESNO

CALWA

MALAGA

EASTON

FOWLER

Church Ave
Jensen Ave
North Ave
Muscat Ave
Central Ave
Malaga Ave
American Ave
Jefferson Ave
Lincoln Ave
Clayton Ave
Adams Ave
Sumner Ave
Clovis Ave
Minnewawa Ave
Elm Ave
Cherry Ave
East Ave
Orange Ave
Cedar Ave
Maple Ave
Chestnut Ave
Willow Ave
Peach Ave
Villa Ave
Kenneth Ave

99
41

Pedestrian
Bicycle
Bicycle
Pedestrian
Bicycle
Pedestrian
Bicycle
Bicycle
Bicycle
Pedestrian
Pedestrian
Bicycle
Pedestrian
Pedestrian
Bicycle
Pedestrian
Bicycle

Fresno County
Study Area

Fatal	[3]	Fresno County		Fire Station #89	
Injury (Severe)	[6]	City of Fresno (city limits)		Cherry Avenue Auction	
Injury (Other Visible)	[6]	Triangle Industrial Study Area		Orange Elementary	
Injury (Complaint of Pain)	[3]	Rail		Ulta Dist. Center	
				Amazon Dist. Center	

N

0 0.25 0.5 0.75 1

Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

2012-2017 Pedestrian and Bicycle Collision Severity Map

Project No. 11192258
Date 6/12/2019

Fresno Council of Governments
GHD

L:\Prj\2618\G2618\Maps\Working\Collisions_bike&ped (2012-2017).mxd
Print date: 17 Jun 2019 - 14:17

Paper Size ANSI B (portrait)

Data source: GHD 2019, TIMS Public GIS data (collisions), Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

4. Bikeways

The *Highway Design Manual (HCM - Chapter 1000 (Bicycle Transportation Design))* recognizes mobility for all modes of travel as an essential element of the transportation system. The role of bikeways is one mode of travel to the transportation system and are one part of an effort to improve bicycling safety and convenience as a way to either help to accommodate motor vehicle and bicycle traffic on the roadway system, or as a complement to the road system to meet the needs of a bicyclists.

As part of the decision to develop bikeways, it is essential that the bikeway network be interconnected to improve safety for all users and access for bicycles. The decision to develop bikeways should be made in coordination with the local agencies.

The *City of Fresno's Active Transportation Plan (ATP)* is a comprehensive guide that outlines the vision for active transportation in the City of Fresno. The plan serves as a roadmap for achieving its goals superseding the existing *City of Fresno Bicycle, Pedestrian & Trails Master Plan* serving as the City's bicycle master plan and pedestrian master plan. The ATP attempts to improve the accessibility and connectivity of the bicycle and pedestrian network to promote active transportation while providing walking and bicycle facilities.

Additionally, *Fresno County Regional Bicycle and Recreational Trails Master Plan* is one component that outlines the continued efforts towards making bicycling an integral part of Fresno County. The plan provides a comprehensive view for long range development of an extensive bikeway and recreational trails network that connects cities and unincorporated areas countywide.

Furthermore the role of bikeways also complies with Complete Streets – Integrating the Transportation system. The California Complete Streets Act requires general plans to develop a plan for multi-modal transportation system. The goal, to encourage cities to reconsider policies emphasizing automobile circulation and highlight all modes of transportation, i.e. bicycle ridership. Bicycle ridership reduces traffic jams increasing the capacity of the transportation network and promotes greenhouse gas emissions improving air quality and the overall travel experience for road users.

All bicycle plans mentioned above intend to guide and influence bikeway, pedestrian, and recreational trails, policies, programs and development of standards within their jurisdictions. Successful implementation of these policies, programs and development standards requires coordination with appropriate agencies to provide consistency and continuity for promoting bicycling as an alternative with other forms of transportation.

4.1 Bikeway Facility Types

The HCM defines 5 facility types are listed and illustrated below:

1. Shared Roadway (No Bikeway Designation)

- Not designated as bike way paths (no markings or signage posted), although most bicycle travel occurs on these streets and highways.

2. Class I Bikeway (Bike Path)

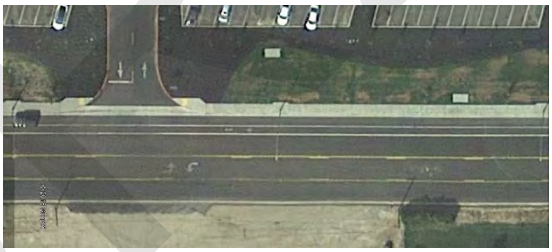
- Exclusive right of way, path completely separated from the roadway

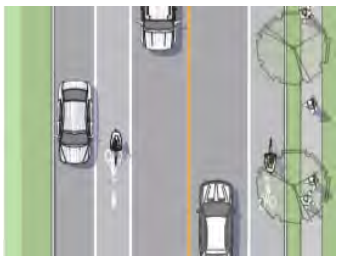
Fresno – Clovis Rail Trail (Shepard Avenue/Millbrook Avenue)

Images from Caltrans Guide[1]

3. Class II Bikeway (Bike Lane)

- Restricted right of way designated for bicycle use, designated by solid white striping





[1] Caltrans: A Guide to Bikeway Classification, July 2017

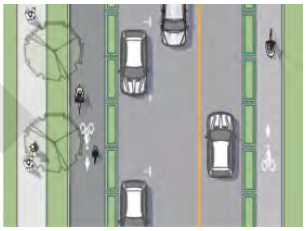
4. Class III Bikeway (Bike Route)

- Shared right of way for motor vehicles and bicycles

McKinley Avenue/Van Ness Avenue (near Fresno City College)

5. Class IV Bikeways (Separated Bikeways)

- Exclusive right of way with designated buffer zone from path of travel
- No Class IV bikeways current/planned within Fresno County jurisdiction



Division Street, San Francisco

Both City of Fresno and County of Fresno also follow the descriptions of the 5 facility types as noted in the HDM.

4.2 Study Area – Bicycle Facilities

The study area encompasses approximately 15 square miles serving two jurisdictions, City of Fresno (approximately 3 square miles) and Fresno County (approximately 12 square miles). Figure 4.1 illustrates the boundary limits for both jurisdictions.

The City of Fresno is the 5th largest city in California with an estimated population of 531,580 people in 2018 covering about 112 square miles. The City is located in central California (San Joaquin Valley).

Figure 4.1 – Project Area by Jurisdiction

Google Arial Image

As illustrated in Figure 4.1, the study area within the City of Fresno boundary limits encompasses approximately 3 square miles (approximately 20 percent) of the total study area.

The remaining vast area, approximately 12 square miles or 80 percent of the project area is considered rural Fresno County. According to the *Fresno County General Plan County wide Land Use Diagram* this area is mostly zoned agriculture, therefore bicycle facilities do not exist as described by Caltrans five facility types. That said, the area roadways infrastructure shares the road with bicyclists and can be considered mixed use of the roadway system. Therefore, bicycle movement along these rural county roads can inhibit ridership use base on the level of stress that the roadway presents (road width, traffic speed, the presence of parking lane, etc...). Level of Stress is discussed in a subsequent section.

4.2.1 Fresno City – Bicycle Facilities

Existing Facilities

The *City of Fresno ATP* identifies the existing networks of bike lanes and bike routes for both cyclist and pedestrians. A total of 491 miles of bikeway facility types have been constructed to date, a process that began with the adoption of the *1974 Fresno General Plan* and the City's first *Bicycle Master Plan*. Table 4.1 identifies the type and miles of bikeway for 2010 and 2016, a percentage change of 93% increase. This network of bike lanes and bike routes built over time may contain discontinuities or gaps within the network.

Table 4.1: Bicycle Network Facilities

Type	2010 Miles	2016 Miles
Class I Bike Paths	14	38
Class II Bike Lanes (one-direction)	226	431
Class III Bike Routes (one-direction)	14	22
Total(s)	**254**	**491**

Fresno ATP, December 2016

Within Study Area

Pertaining to the study area there currently exists Class II bike lanes. These Class II bike lane segments are located on:

- Church Avenue from Fig Avenue to Golden State Boulevard
- North Avenue from Cherry Avenue to Orange Avenue
- Central Avenue from Ulta Distribution Center frontage road section to East Avenue
- Amazon Distribution Center frontage road section to Orange Avenue
- Cherry Avenue from Valley Iron Inc. (frontage road – 1,300 ft south of North Avenue) to Cummins Pacific (frontage road – 675 ft north of Annadale Avenue)
- East Avenue from Central Avenue to Dorothy Avenue

- Orange Avenue from Central Avenue to Fresno Industrial Center driveway (just south of the overpass)

In total, the network of bike lanes within the study area make up approximately 5.5 miles or one percent of the total bike network as noted in Table 4.1. Figure 4.2 identifies the network of bike lanes within the study area as well as those surrounding the project limits. As illustrated in Figure 4.2, there are Class II bike lane facilities north of Central Avenue (within city limits). This area has seen design improvements that encompass complete street standards.

A challenge regarding the existing bikeway network is the connectivity of the system to nearby bikeway networks, Elm Avenue to the west and Church Avenue to the north. As mentioned earlier, one of the goals to promote bicycling is connectivity of the bicycle network. With continual growth of the area, implementation of policies, programs and development standards with appropriate agencies is a way to successfully complete connectivity of the bike network within the project area.

FIGURE 4.2

CITY OF FRESNO
CALWA
MALAGA
EASTON
FOWLER
99
41
Ventura St
Church Ave
Jensen Ave
Annadale Ave
North Ave
Central Ave
Dorothy Ave
Muscat Ave
Malaga Ave
Minnewawa Ave
American Ave
Jefferson Ave
Lincoln Ave
Clayton Ave
Adams Ave
Sumner Ave
Elm Ave
Cherry Ave
East Ave
Orange Ave
Cedar Ave
Maple Ave
Chestnut Ave
Willow Ave
Peach Ave
Villa Ave
Kenneth Ave
Clovis Ave

Fresno County
Study Area

- Class II - Bicycle Lane
- State Route (Freeway)
- Roads
- Rail
- Fresno County
- City of Fresno (city limits)
- Sphere of Influence Boundary
- Triangle Industrial Study Area
- HSR_Maintenance Facility
- Fire Station #89
- Cherry Avenue Auction
- Orange Elementary
- Ulta Distribution Center
- Amazon Distribution Center

N

0 0.25 0.5 0.75 1
Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Bikeways Map

Project No. 11192258
Date 6/12/2019

Fresno Council of Governments
GHD

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Print date: 30 Jul 2019 - 09:31

Paper Size ANSI B (portrait)

Data source: GHD 2019, Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

4.3 Bicycle Level of Stress – Base Line Condition

Overview

Existing bicycle conditions for the study area were analyzed based on the Mineta Transportation Institute's Bicycle Level of Traffic Stress (LTS) methodology, which can be obtained from the paper, *Low Stress Bicycling and Network Connectivity* (Report 11-19, Mineta Transportation Institute, May 2012). Bicycle LTS is a rating system of the safety, comfort, and convenience of transportation facilities from the perspective of the user. The approach outlined in the Mineta report uses roadway data, (i.e., posted speed limit, number of travel lanes, daily traffic levels, and presence and character of shoulder or bicycle lanes) to analyze bicyclist comfort level. The Bicycle LTS methodology breaks road segments into one of four classifications/ratings for measuring the effects of traffic-based stress on bicycle riders, with 1 being the lowest stress or most comfortable, and 4 being the highest stress or least comfortable. The greater the separation between the outside travel lane and bicyclist generally means less stress for users. Examples and descriptions for each level of traffic stress are shown in Figure 4.3.

Methodology

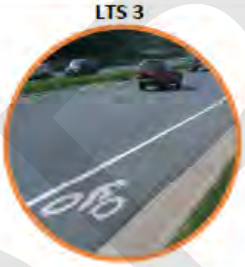
LTS 1 is assigned to roads that would be suitable for most children to ride, and to multi-use paths or cycle tracks separated from motorized traffic. LTS 2 is assigned to roads that could be comfortably ridden by the average adult population. For purposes of this analysis, road segments with LTS scores of 1 or 2 are characterized as "low-stress" bicycle connections. These low-stress LTS scores reflect bicycling conditions that 60 percent of the general population would consider favorable enough to consider traversing the roadway by bicycle. LTS 3 is the level assigned to roads that would be acceptable to an "enthused and confident" cyclists, while LTS 4 is assigned to segments that are only acceptable to "strong and fearless" bicyclists—those who will confidently tolerate riding on roadways characterized by minimal separation from high motor vehicle volumes and speeds. For purposes of this analysis, road segments with LTS scores of 3 or 4 are characterized as "high-stress" bicycle connections. Thus, even if bicycle infrastructure exists between two places, it would not be considered viable for biking to 60% or more of the general pollution if the connection is rated as high-stress.

The Bicycle LTS methodology is broken into three categories: segments (along), intersection approaches (turn lanes), and intersection crossings (unsignalized). Specific criteria are applied separately for each category. Dependent upon community context and the detail level desired, the overall methodology can usually be simplified based on the general consistency of facility types, as certain elements (i.e. no turn lanes, no bike lanes, limited speeds, etc.) may not exist in a particular community.

It is likely that the LTS scores show directional differences along a given route, due to potential differences in infrastructure characteristics. Therefore, both directions are reported for a given roadway segment. However, the methodology for the criteria aggregate (overall LTS) follows the weakest link principle: the dimension with the worst level of stress governs. For example, if the two directions of a roadway segment result in different scores, the worst of these two segments are

reported as the overall score. Moreover, if a segment is considered low stress, and there is a high stress intersection approach at the end of the segment, the whole segment is considered high stress. Figure 4.3 presents the LTS for the segments, approaches, and intersections for the roadways in the study area.

Figure 4.3 Level of Stress (LTS) Score Descriptions

LTS 1  Comfortable for all ages and abilities	Represents little traffic stress and requires less attention, so is suitable for all cyclists. This includes children that are trained to safely cross intersections (around 10 yrs. old/5th grade) alone and supervising riding parents of younger children. Generally, the age of 10 is the earliest age that children can adequately understand traffic and make safe decisions which is also the reason that many youth bike safety programs target this age level. Traffic speeds are low and there is no more than one lane in each direction. Intersections are easy to cross by children and adults. Typical locations include residential local streets and separated bike paths/cycle tracks.
LTS 2  Comfortable for most adults	Represents little traffic stress but requires more attention than young children can handle, so is suitable for teen and adult cyclists with adequate bike handling skills. Traffic speeds are slightly higher but speed differentials are still low and roadways can be up to three lanes wide in total for both directions. Intersections are not difficult to cross for most teenagers and adults. Typical locations include collector-level streets with bike lanes or a central business district.
LTS 3  Comfortable for confident bicyclists	Represents moderate stress and suitable for most observant adult cyclists. Traffic speeds are moderate but can be on roadways up to five lanes wide in both directions. Intersections are still perceived to be safe by most adults. Typical locations include low-speed arterials with bike lanes or moderate speed non-multilane roadways.
LTS 4  Uncomfortable for most	Represents high stress and suitable for experienced and skilled cyclists. Traffic speeds are moderate to high and can be on roadways from two to over five lanes wide in both directions. Intersections can be complex, wide, and or high volume/speed that can be perceived as unsafe by adults and are difficult to cross. Typical locations include high speed or multilane roadways with narrow or no bike lanes.

Source: "Low Stress Bicycling and Network Connectivity", Mineta Transportation Institute, Report 11-19, May 2012.

Existing Bicycle LTS Summary

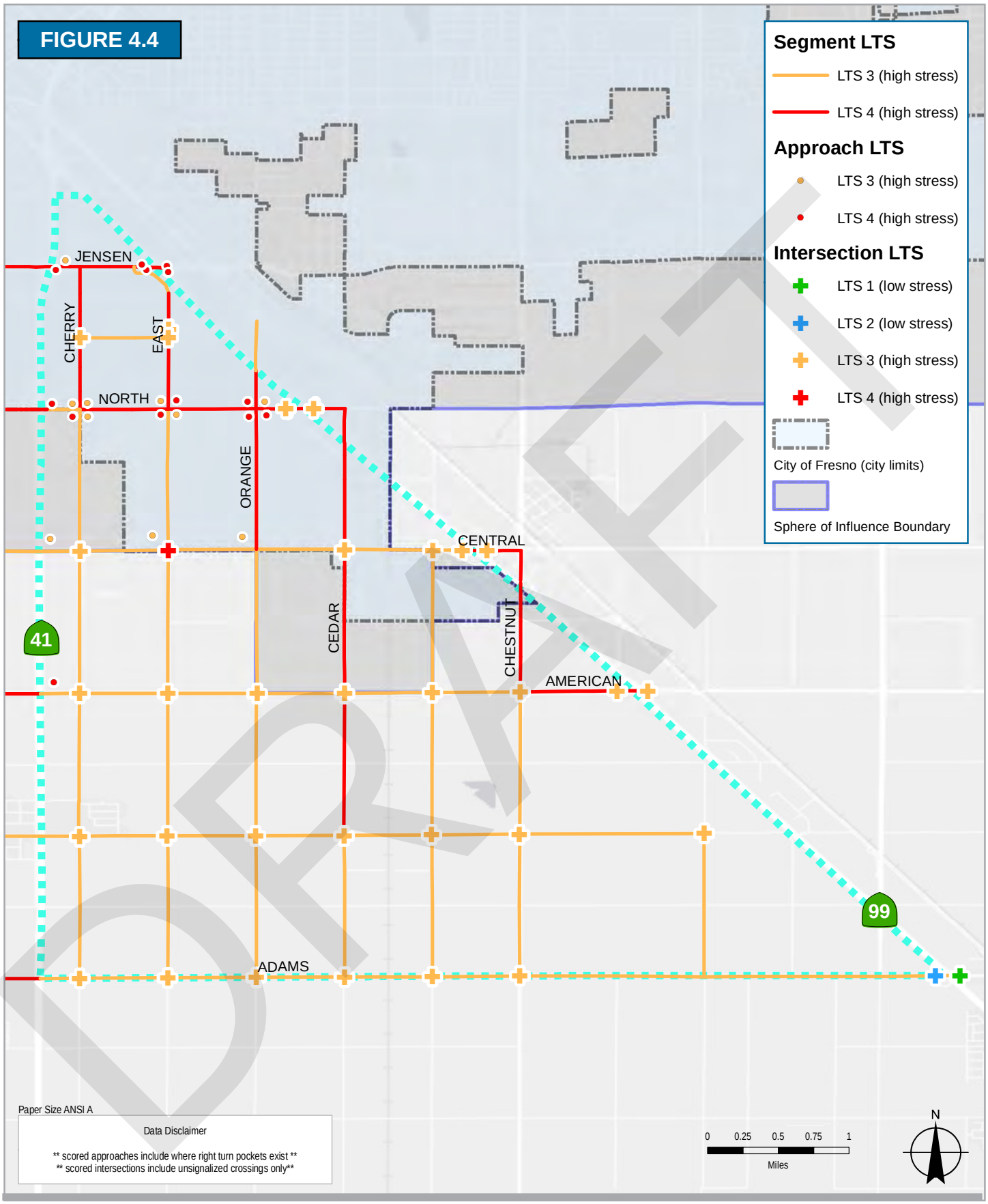
North Point Business Park

Figure 4.4 summarizes the Bicycle LTS results for the segments, crossings, and intersection approaches in the study area as applicable. As illustrated, areas with commercial development (area between Jensen Avenue and North Avenue) recorded high-stress due to the higher speeds and daily traffic volumes. As an example, North Avenue at the North Point Business Park (photo to the right) located at North Avenue/East Avenue is an arterial road that incorporates complete street characteristics such as dedicated class II bike lanes, two-thru lanes and a median/two-way left turn lane.

Intersection of Adams Avenue/Cedar Avenue

The southern portion of the study area also recorded high stress (south of Central Avenue). Similar to the northern portion of the study area; speed and lack of bicycle facilities contributed to high stress levels for the segments and intersections. Approaches were not mapped due to the absence of right turn lanes. The approaches would not be considered high stress, due to lower volumes and no right turn. As an example, the intersection of Adams Avenue/Cedar Avenue (photo above) is representative of intersection approaches within the southern portion of the area, most of which lacked dedicated right turn lanes.

FIGURE 4.4



REVERSE TRIANGLE TRANSPORTATION AREA PLAN

Bicycle Level of Traffic Stress

Project No. 11192258
Date 08/26/2019

Fresno Council of Governments

GHD

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Print date: 28 Aug 2019 - 11:17

Horizontal Datum: WGS 1984
Grid: GCS WGS 1984

Data source: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community. Created by: jramirez2

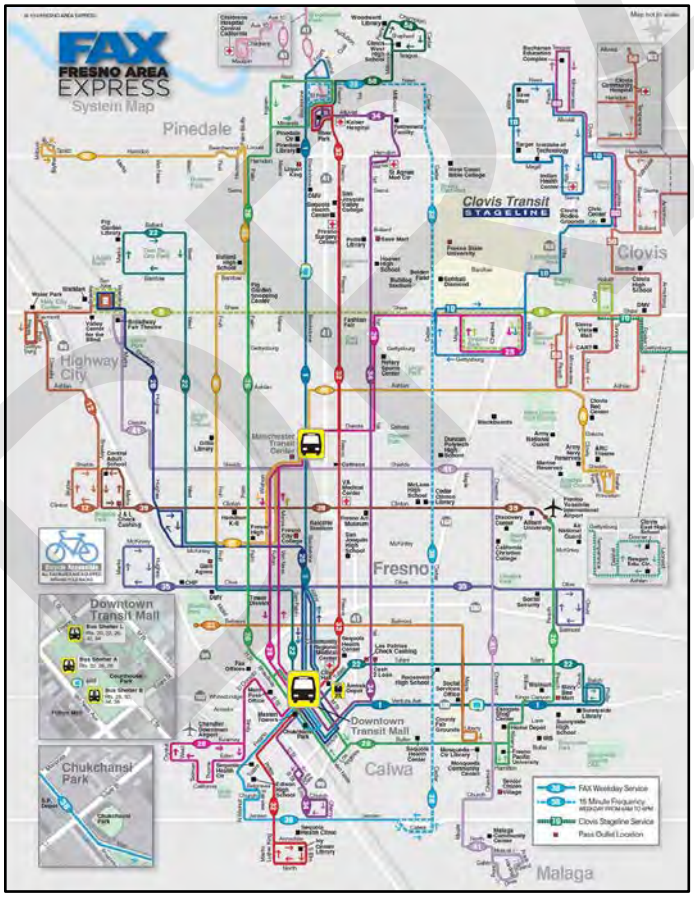
3. Existing Transit Services

History

Starting in 1889, Fresno's public transportation system consisted of a horse car line. In 1901 the Fresno City Railway Company was established; it later was replaced by the Fresno Traction Company that converted the streetcar lines into electricity. As reported in *Wikipedia*, the electric streetcars (shown to the right) operated on approximately 42 miles of track by the mid-twenties. The electric streetcars were used until 1939, when the transit company replaced them with buses. Since then, Fresno City Lines, Inc., operated until 1961, when the City of Fresno took over municipal bus service. From 1961 to 1969, the name of the transportation service was Fresno Municipal Lines and then as Fresno Transit until 1989, where it became known as Fresno Area Express or FAX.

FAX

FAX is the largest provider of transit services in the region, with 9,750,800 annual boardings in FY 2018, and an annual operating budget of approximately $46 million (2015). FAX service consists of 17 fixed routes in the City of Fresno with three major hubs: the downtown transit mall, the Manchester transit station along Blackstone Avenue north of downtown, and a transfer point at the River Park shopping center in north Fresno. The standard adult fare is $1.25; this is below market compared to other cities this size. Children under age 6 ride free (children – maximum of 4 – must be accompanied by a fare paying family member), and seniors and the disabled pay just $.60. FAX accepts 6 different types of passes, including:



- 31-day pass
- 31-day reduced fare pass
- 10 ride card
- 10 ride card (reduced fare)
- 1 ride card
- 1 ride card (reduced fare)

Service frequencies vary from 15 minutes to 60 minutes with a many routes operating at

30-minute headways. Regular service stops at 10:00 pm on most routes on weekdays, with extended service until 1:00 am on the most heavily travelled sections of certain routes. The service operates until approximately 7:00 pm on weekends. The extended night service is relatively new and was developed to address the limited viability of transit for many workers, students and low-income people who need public transportation outside of current operating hours. Service frequency on the weekends is at 30 minutes for all routes excluding the four lowest performing routes.

FAX Q

Q provides faster, more convenient and more reliable service than a traditional bus line. Funded by federal and state funds, Q vehicles are modern and comfortable with off-board fare payment-all at the same fare as a regular FAX bus. Ten-minute frequencies at peak time make for a short wait. Fewer stops mean reduced travel time. Bus priority traffic signals also help speed up the trip. Plus, enhanced stations make for a more pleasant wait.[1]

Q's initial route spans 15.7 miles on Blackstone Avenue, from North Fresno Street to downtown, then out Ventura Avenue/Kings Canyon Rode to Clovis Avenue. The project includes 51 station pairs (or 48 one-way stations), two terminal stations, and one transit center with a shared platform station. Q serves major shopping centers, hospitals, and other significant destinations. In future years, additional Q routes could be added to further improve the FAX System.

Q is an adaptable and cost-effective choice in building for the region's growing transit needs. Less expensive and more flexible than light rail, Q can adapt to the emerging needs and opportunities-such as a downtown high-speed rail station- while providing fast, frequent, and reliable service for Fresno today.

Handy Ride

Handy Ride is a demand-responsive program oriented toward providing a high level of service to elderly and disabled persons who, because of physical or mental disabilities, are unable to ride the fixed-route system. This dial-a-ride service conforms with ADA requirements for these types of service. FAX began operating Handy Ride service In April 1977.

Short Range Transit Plan

The Fresno Area Express (FAX) Short-Range Transit Plan (SRTP), FY 2018-2022, is the biennial update to the operating plan and the capital program. The purpose of SRTP is to promote a comprehensive, coordinated and continuous planning process for transit service in the Fresno-Clovis Metropolitan Area (FCMA) over a five-year planning horizon. The SRTP proposes specific recommendations for implementing the long-range objectives of Fresno County's Regional Transportation Plan (RTP), and will guide the provision of transit services in the FCMA over the next five years.

The SRTP is also used to develop transit capital programming documents that are the basis for state and federal funding decisions. The SRTP provides both the Federal Transit Administration (FTA) and Fresno COG with the detailed planning justification for awarding operating and capital grants to FAX. The SRTP

[1] https://www.fresno.gov/transportation/fax/fax-q/

was developed through an analysis of existing needs and available services, and provides an evaluation of projected needs and funding availability for the next five years.

This SRTP outlined past trends in Fresno County, including:

- Very little traffic congestion makes driving an automobile very attractive for those who can afford them.
- Low density development is occurring on Fresno's urban fringe wher e transit services don't exist now and will likely not exist in the future, ensuring automobile dependency.
- Development encroachment on farmland is an ongoing concern due to the high demand for agricultural products from this region.
- The San Joaquin Valley faces significant air quality challenges. The entire Valley is designated as non-attainment for both the national and California air quality standards for ozone and particulate matter.
- 79%[2] of FAX riders take the bus because they either do not drive or cannot afford a car. This rate is roughly double the transit dependency rate found in other cities of a similar size.
- Due to a number of factors, the demand for Transit Oriented Development (TOD) is lower in Fresno than other US cities of similar size, making it a challenge to build, finance and market these projects.

According to documentation provided in the SRTP, most of Fresno's travel market has its origins and destinations in metropolitan Fresno. 92% of Fresno residents work in Fresno County, and only 8% commute to destinations outside the county. Of the total commute trips in Fresno County, 77% drive alone, 20% carpool or vanpool, and 1% take transit, walk and work from home.[3] Due to heavy rural to rural commute patterns of farm workers, prison guards and teachers in the San Joaquin Valley, carpools and vanpools represent the largest mode share after the single-occupant automobile. Transportation issues in Fresno exemplify the type of challenge that many cities in California face. The passage of SB 375 calls all metropolitan planning areas (e.g., Fresno COG) in the state for a commitment to sustainable solutions.

Building a transportation system solely with the automobile in mind based on a level of service "C or D" for the peak 15 minute demand is one of the most expensive transportation systems to build and maintain. Fresno City and County need a new approach or thought process for determining what is needed to attain an alternative future that provides transportation alternatives to the car for a majority of the population. Fresno's metro region is a top five leader in the nation with the least amount of commute congestion and travel time and travel speeds of all major metropolitan regions. In fact, the Fresno COG Regional Travel Demand Forecast model suggests that in the next 20-30 years

[2] Based upon 2014 FAX rider survey.

[3] SJV Express Study by Nelson Nygaard, 2009.

the travel speeds of our region will only decrease by one or two miles per hour, whereas in the same timeframe, the Sacramento metro region's travel speeds will nearly be cut in half.

Thus, a fundamental shift in thinking has occurred in the greater Fresno metropolitan area and at FAX. The SRTP indicates that serving the transit needs of a growing population has as more to do with the support of land use regulators and developers to bring the population growth to where the bus service currently exists than it does with trying to ever-expand the bus service to meet the demands of people.

Those who choose to live on the urban fringe where these services currently exist cannot be provided for in a financially sustainable way. In a sense, the responsibility has shifted from the transit providers to the community development departments and private developers to make the transit system work and to clean up Fresno's air quality. FAX Administration questions the ability to expand service to meet the transit needs of an ever-outward expanding low-density suburban population.

Given that auto and truck travel account for about one-third of greenhouse gas emissions, Fresno County and its cities must consider implementing more-efficient, high-capacity modes of transportation that provide attractive options to the auto. Such transportation modes must provide suitable alternative travel options to parts of the population who have limited mobility, with a focus on higher density and mixed-use corridors where large numbers of households and businesses can be served by transit investments. Currently the majority of Fresno's transit riders use the system out of necessity, rather than choice. To maximize transit ridership and reduce congestion in the future, it will be important to continue to serve and attract ridership among households that need transit, as well as those who might choose to take transit though they can afford to drive.

FAX Fleet

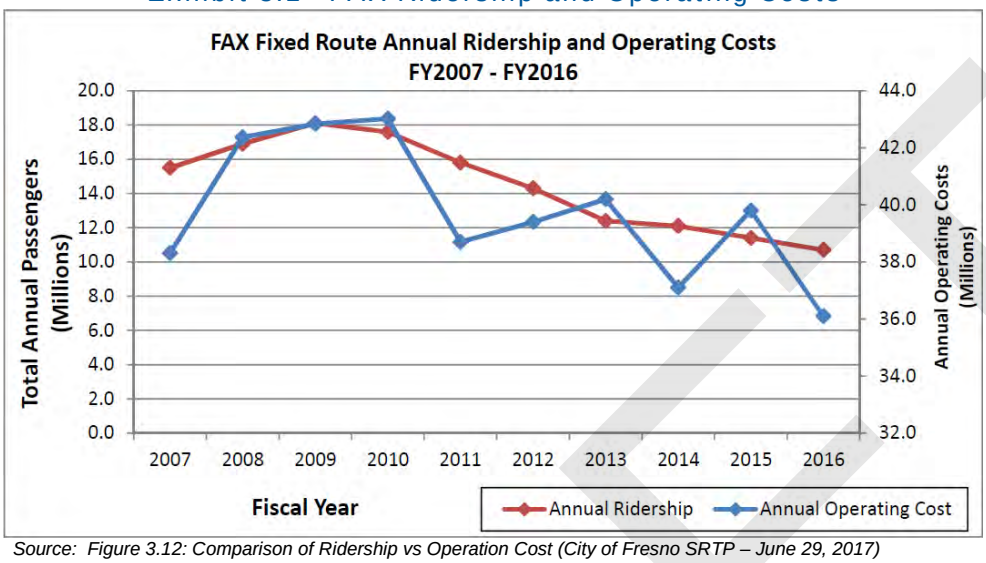
FAX has a number of types and variations of vehicles to provide transit services. For example, FAX has a combination of compressed natural gas (CNG), hybrid (gasoline/electric) and electric vehicles of varying sizes. Most buses in the FAX fleet are 30 to 40 feet in length (over 100 in service). Handy Ride, FAX's demand responsive service, is composed of nearly 50 wheelchair lift equipped mini buses and nearly a dozen sedans.

Ridership Summary

FAX ridership peaked in 2008/2009 with close to 18 million riders as shown in Exhibit 3.1 (red line). High ridership during this period can be explained by high gasoline prices and a struggling U.S. economy amidst the Great Recession[4]. Since 2008/2009, transit ridership has steadily declined through 2016, where it was reported that over 11 million riders utilized FAX services.

[4] The Great Recession is a term that represents the sharp decline in economic activities, officially lasting from December 2007 to June 2009. (Investopedia.com/terms/g/great-recession.asp).

Exhibit 3.1 - FAX Ridership and Operating Costs



Source: Figure 3.12: Comparison of Ridership vs Operation Cost (City of Fresno SRTP – June 29, 2017)

According to *Trends in Public Transportation Ridership: Implication for Federal Policy,*[5] the two factors that most affect public transportation ridership are competitive factors and the supply of transit service. Several competitive factors, notably the drop in the price of gasoline over the past few years and the growing popularity of bike-share and ridesourcing services (e.g., Uber, Lyft, ect.), appear to have adversely affected transit ridership. The amount of transit service supplied has generally grown over time, but average fares have risen faster than inflation, possibly deterring riders.

The future of public transportation ridership in the short to medium term is likely to depend on population growth; the public funding commitment to supplying transit; and factors that make driving more or less attractive, such as the price of parking, the extent of highway congestion, and the implementation of fuel taxes, tolls, and mileage-based user fees. Over the long term, ridership is also likely to depend on the introduction of autonomous vehicle technology, although its timing is uncertain. Fleets of driverless taxis that can be hailed with a smartphone, a plausible scenario, promise to be much cheaper than taxis and ridesourcing today. Widespread deployment of driverless taxis could reduce transit ridership, unless restrictions or fees make them an expensive alternative in some areas.

[5] William J. Mallett, Congressional Research Service (March 26, 2018).

4. Fresno County Rural Transit Agency

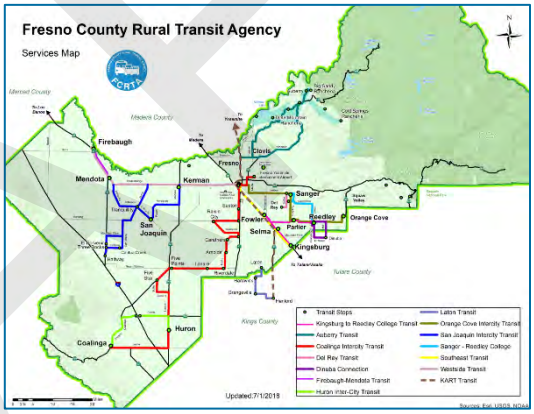
History

According to the Fresno County Rural Transit Agency (FCRTA) website, FCRTA provides local and regional transit service to rural cities within Fresno County. FCRTA allows passengers to travel conveniently, within their community and throughout Fresno County, by providing both inner-city service to residents of communities within our service area, as well as intercity service from the outlying communities. FCRTA also offers demand responsive service for individuals requiring curb-to-curb transportation.

In 1979, FCRTA began operation with 20 vehicles and 13 subsystems. Today, the service has grown to 25 subsystems with 80 vehicles serving communities from Firebaugh to Coalinga, Kingsburg to Orange Cove, and everything in between. FCRTA serves the transit needs of the disadvantaged: the elderly, disabled, low income, youth, as well as the public.

FCRTA

FCRTA provides regular fixed routes as well as reservation based services. **Regular routes** consist of designated routes and schedules. Riders can access via website (*https://www.ruraltransit.org/route-schedules*) fixed route schedule and map guides to determine the closest bus stops, appropriate routes and transfers and pick-up/drop-off times. Route schedule guides include:



FCRTA website

- ⇒ Coalinga Route Guide
- ⇒ Huron Route Guide
- ⇒ Kingsburg-Reedley Guide
- ⇒ Orange Cove Route Guide
- ⇒ Sanger Express Route Guide
- ⇒ Southeast Route Guide
- ⇒ Westside Route Guide

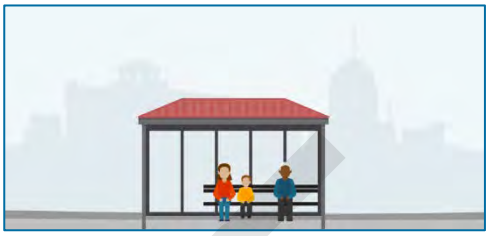
Additionally, riders can also call the local phone number for transit provider in their area for information on fixed routes, maps and schedules.

Demand reservation base services are demand responsive services that offer curb to curb transportation. Riders call their local transit provider, identify their location, desired destination and departure time. A driver is then picked-up and transports the patron. Demand services is limited to within the rural transit service area during regular service hours.

FCRTA has relationships with a number of local, regional and statewide transit providers. The following are the area transportation providers:

- ⇒ Fresno Area Express (FAX) scheduled, fixed route service with connections to Valley Children's Hospital in Madera County
- ⇒ FAX Handy Ride ADA demand responsive services

- ⇒ Clovis Transit Stageline schedule, fixed route service
- ⇒ Clovis Transit's Round-Up's demand responsive ADA services
- ⇒ Kings Area Rural Transit (KART) schedule, fixed route services to Fresno and Hanford
- ⇒ Dinuba Connection schedule fixed route travels from Dinuba to Reedley with transfers Cutler-Orosi, Orange Cove, Parlier, Sanger and Fresno



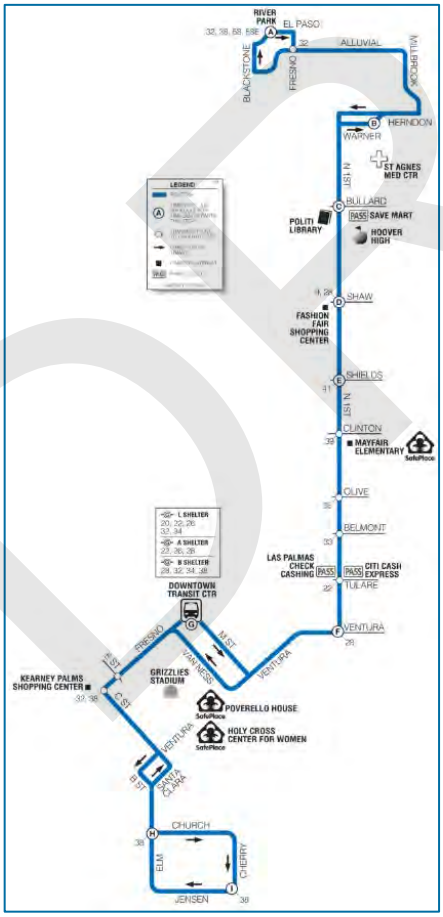
Cropped photo: FCRTA website

One-way fares for service within a community range from 35 cents for the elderly and children accompanied by an adult, to 75 cents for the general public. Senior citizens and disabled individuals ride for free on intra-city buses.

Fares for intercity service are generally half the price of fares granted to common carriers by the California Public Utilities Commission. They range from 75 cents to $6.00 per one-way trip, depending on distance traveled. Fares may be subject to change.

Project Area

Figure 3.1 identifies FAX and FCRTA routes in or near the project area. As identified, there are four FAX routes, which include: Routes 32, 34, 38 and 41. Route 34 (Jensen Avenue) and 38 (Cherry Avenue) travel through the project area that include approximately 15 bus stops locations combined. FCRTA routes in or near the project area are; Coalinga Transit, Kart Transit and Southeast Transit.



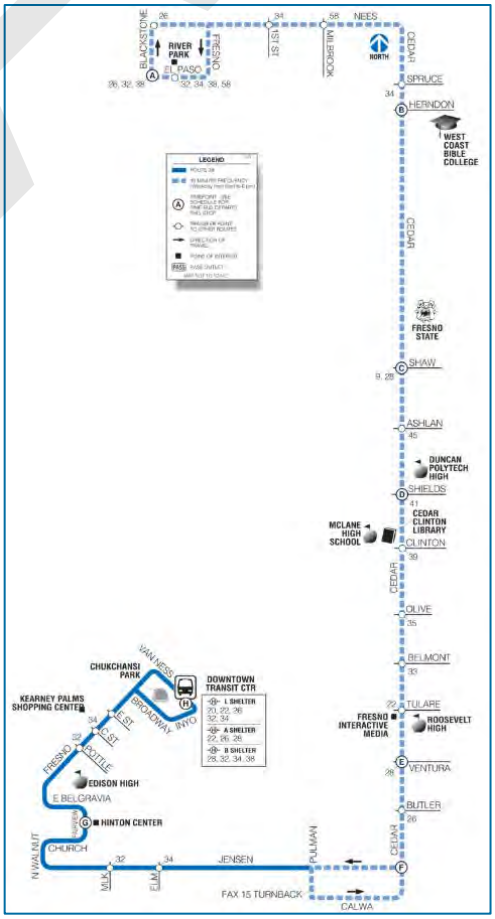


FIGURE A

CITY OF FRESNO

99

41

Church Ave

CALWA

Jensen Ave

North Ave

Muscat Ave

MALAGA

Central Ave

Malaga Ave

Minnewawa Ave

American Ave

Jefferson Ave

EASTON

Lincoln Ave

Clayton Ave

Adams Ave

Sumner Ave

Elm Ave

Cherry Ave

East Ave

Orange Ave

Cedar Ave

Maple Ave

Chestnut Ave

Willow Ave

Peach Ave

Villa Ave

Kenneth Ave

Clovis Ave

FOWLER

Route 32
Route 34
Route 38
Route 41

Coalinga Transit
KART Transit
Orange Cove Transit
Southeast Transit
Westside Transit
Bus Stops

Roads
Rail
Fresno County
City of Fresno (city limits)
Triangle Industrial Study Area

HSR_Maintenance Facility
Fire Station #89
Cherry Avenue Auction
Orange Elementary
Ulta Distribution Center
Amazon Distribution Center

Fresno County
Study Area

N

0 0.25 0.5 0.75 1
Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Bus Routes and Bus Stops

Project No. 11192258
Date 6/12/2019

Fresno Council of Governments

GHD

L:\Prj\2618\G2618\Maps\Working\Bus Routes.mxd
Print date: 27 Aug 2019 - 08:38

Paper Size ANSI B (portrait)

Data source: GHD 2019, Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data and Fresno Council of Governments. Created by: jramirez2

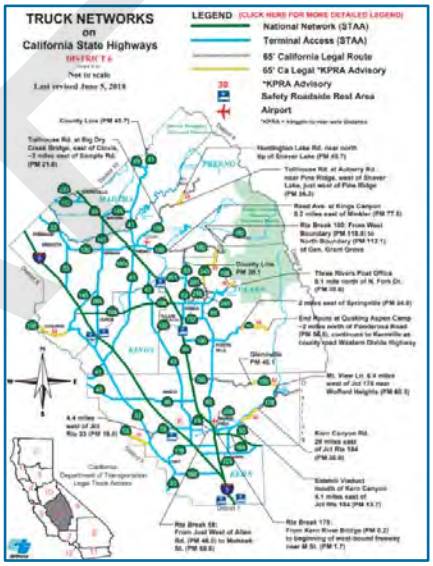
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

5. Freight and Goods Movement

Freight and goods movement play an integral role in the distribution of agricultural products, processed food and energy products throughout California. Additionally, companies have located large regional and national distribution centers in the San Joaquin Valley (SJV) taking advantage of reasonably inexpensive land, low cost labor and goods access to rail and interstate/highway networks.

The highway and local road system is the primary freight infrastructure for the region, and trucking is the leading freight mode. Truck movements in the SJV are centered on the main north-south arteries that include I-5 and State Route (SR) 99. Other important highways include SR-14, SR-41, SR-43, SR-65 and SR-120 along with east-west corridors like SR-58, SR-108, SR-120 and SR-180.

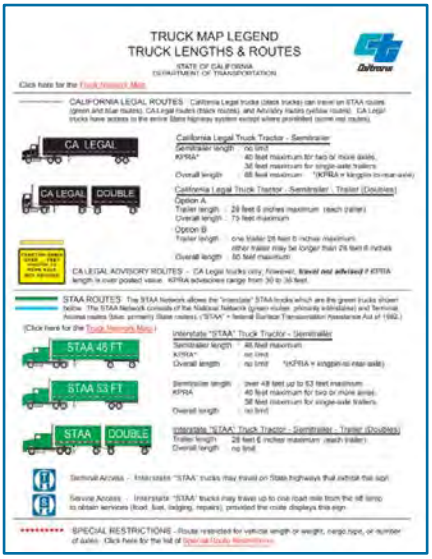
5.1 STAA



According to Caltrans California Truck Network Maps, SR-41 is designated as a Terminal Access (STAA) route and SR-99 is designated as a National Network (STAA) route in the RTTAP. The STAA, Federal Surface Transportation Assistance Act of 1982, allows large trucks to operate on the Interstate and certain primary routes called collectively the National Network. These trucks, referred to as STAA trucks, are longer than California legal trucks.

California Legal trucks can travel on STAA routes, CA legal routes, and advisory routes. CA Legal trucks have access to the entire State highway system, except where prohibited.

These truck networks allow for the movement of goods into, out of, within or through the SJV.



5.2 Study Area

The study area encompasses to two main highways, State Route 99 to the east and SR-41 to the west, along with local roads, Church Avenue to the north and Adams Avenue to the south. State Route 99 and SR-41serve as the backbone for the study area. The roadway network that serve to access SR-99 and SR-41 within the study area encompasses rural county roads and local city roads. Within the City of Fresno they include Jensen Avenue, North Avenue and Central Avenue and within Fresno County they include American Avenue, Clayton Avenue and Adams Avenue (all east-west approaches).

The following roadways provide primary circulation within the Study Area. The following roadway characteristics were attained using FCOG and Fresno County shape file attributes. Figure 2 identifies road classification, speed limit and truck routes within the Study Area.

North – South Alignment

State Route 99 (SR-99) is a major north-south freeway from Bakersfield, CA to Sacramento, CA. Within the study area, SR-99 is a 6-lane divided freeway with a 65 mph posted speed limit. SR-99 is a major good movement corridor.

State Route 41 (SR-41) is a major north-south freeway. Within the study area, SR-41 is a 4-lane divided freeway with a maximum 65 mph posted speed limit. SR-41 is a major good movement corridor.

Cherry Avenue is a 2-lane collector roadway, approximately 5.5 miles in length within the study area. Speed limit is posted at 45 mph. North of Central Avenue to Church Avenue, Cherry Avenue is classified as a truck route. Additionally, Cherry Avenue is the frontage road to Orange Elementary, Cherry Avenue Auction and Fire Station #89.

Orange Center School District

East Avenue is a 2-lane local and collector roadway, approximately 5.0 miles in length within the study area. North of American Avenue to Jensen Avenue, East Avenue is a collector roadway. Speed limit ranges from 45 mph to 55 mph. North of Central Avenue to Jensen Avenue, Cherry Avenue is classified as a truck route. Additionally, Cherry Avenue is the frontage road to the Ulta Distribution Center.

Orange Avenue is a 2-lane local and collector roadway, approximately 4.5 miles in length within the study area. North of American Avenue to Jensen Avenue (study area limits), Orange Avenue is a collector roadway (and also beyond Jensen Avenue). Speed limit is posted at 55 mph. North of American Avenue to project limits, Orange Avenue is classified as a truck route. Additionally, Orange Avenue is the frontage road to the Amazon Distribution Center.

Amazon Distribution Center

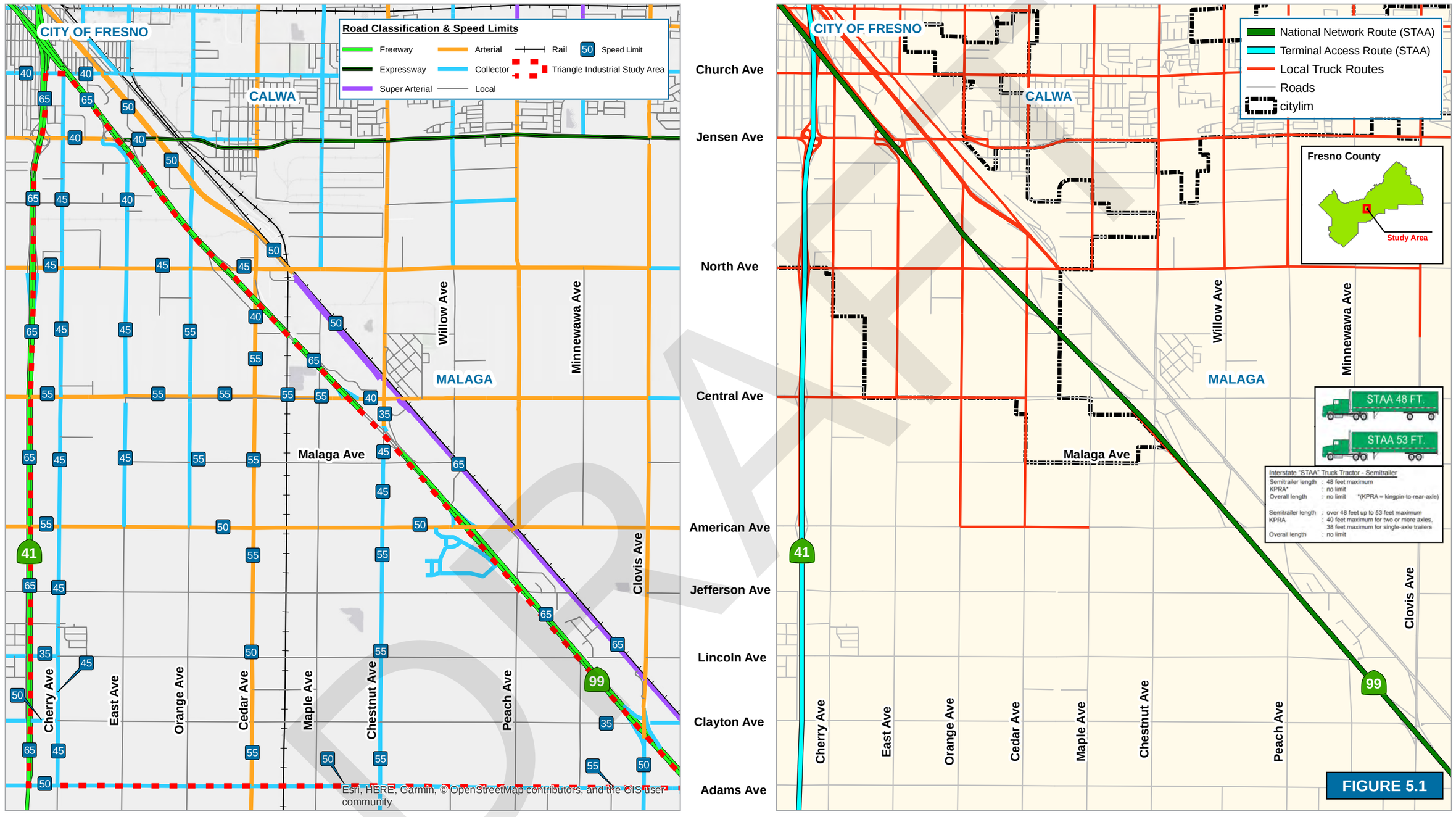


FIGURE 5.1

Road Classification, Speed Limits and Truck Routes

N

0 0.4 0.8 1.2 1.6

Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Project No. 11192258
Date 6/12/2019

Fresno Council of Governments

GHD

L:\Prj\261\G2618\Maps\Working\Road Classification (landscape).mxd
Print date: 23 Aug 2019 - 15:52

Paper Size ANSI B (Landscape)

Data source: GHD 2019, Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

Cedar Avenue is a 2-lane arterial roadway, approximately 4.0 miles in length within the study area. Speed limit is posted at 55 mph. North of American Avenue to project limits and beyond, Cedar Avenue is classified as a truck route. Cedar Avenue assesses southbound SR-99. Additionally, Cedar Avenue is the proposed frontage road to the High Speed Rail Maintenance Facility.

Cedar Avenue/High Speed Rail

Maple Avenue is a 2-lane local roadway, approximately 3.25 miles in length within the study area. Speed limit is considered 55 mph, no posted speed limits signs were observed. This roadway is not part of the truck route system.

Chestnut Avenue is a 2-lane collector roadway, approximately 3.0 miles in length within the study area. Speed limit is posted at 55 mph. Chestnut Avenue assesses southbound SR-99. This roadway is not part of the truck route system.

Peach Avenue is a 2-lane local roadway, approximately 2.0 miles in length within the study area. Speed limit is considered 55 mph, no posted speed limits signs were observed. This roadway is not part of the truck route system.

Minnewawa Avenue is a 2-lane local roadway, approximately 2.0 miles in length within the study area. Speed limit is considered 55 mph, no posted speed limits signs were observed. This roadway is not part of the truck route system.

Clovis Avenue is a 2-lane collector roadway, approximately 0.5 miles in length within the study area. North of State Route 99, Clovis Avenue is an arterial 4-lane arterial roadway. Speed limit within project area is posted at 50 mph. Clovis Avenue accesses SR-99.

East – West Alignment

Church Avenue is a 2-lane collector roadway, approximately ¼ of a mile in length within the study area. Speed limit is posted at 40 mph. This roadway is part of the truck route system.

Ulta Distribution Center

Jensen Avenue is a 4-lane arterial roadway with two-way left-turn lane (TWLTL), approximately 1.0 mile in length within the study area. Speed limit is posted 40 mph. Jensen Avenue accesses both SR-99 and SR-41. This roadway is part of the truck route system.

North Avenue is a 4-lane arterial roadway with two-way left-turn lane (TWLTL), approximately 2.0 miles in length within the study area. Speed limit is posted 45 mph. North Avenue connects to SR-41. This roadway is part of the truck route system.

Central Avenue is a 2-lane arterial roadway, approximately 2.5 miles in length within the study area. Speed limit ranges from 40 mph to 55 mph. Central Avenue accesses SR-41. West of Cedar Avenue, this roadway is part of the truck route system.

American Avenue is a 2-lane arterial roadway, approximately 2.5 miles in length within the study area. Speed limit ranges from 50 mph to 55 mph. American Avenue accesses northbound SR-99 and is partially included in the truck route system (between Orange Avenue and Maple Avenue).

Jefferson Avenue, Lincoln Avenue and Clayton Avenue are 2-lane local roadways, ranging in approximately 2.5 to 3.5 miles in length within the study area. Speed limit is considered 55 mph, no posted speed limits signs were observed. These roadways are not part of the truck route system.

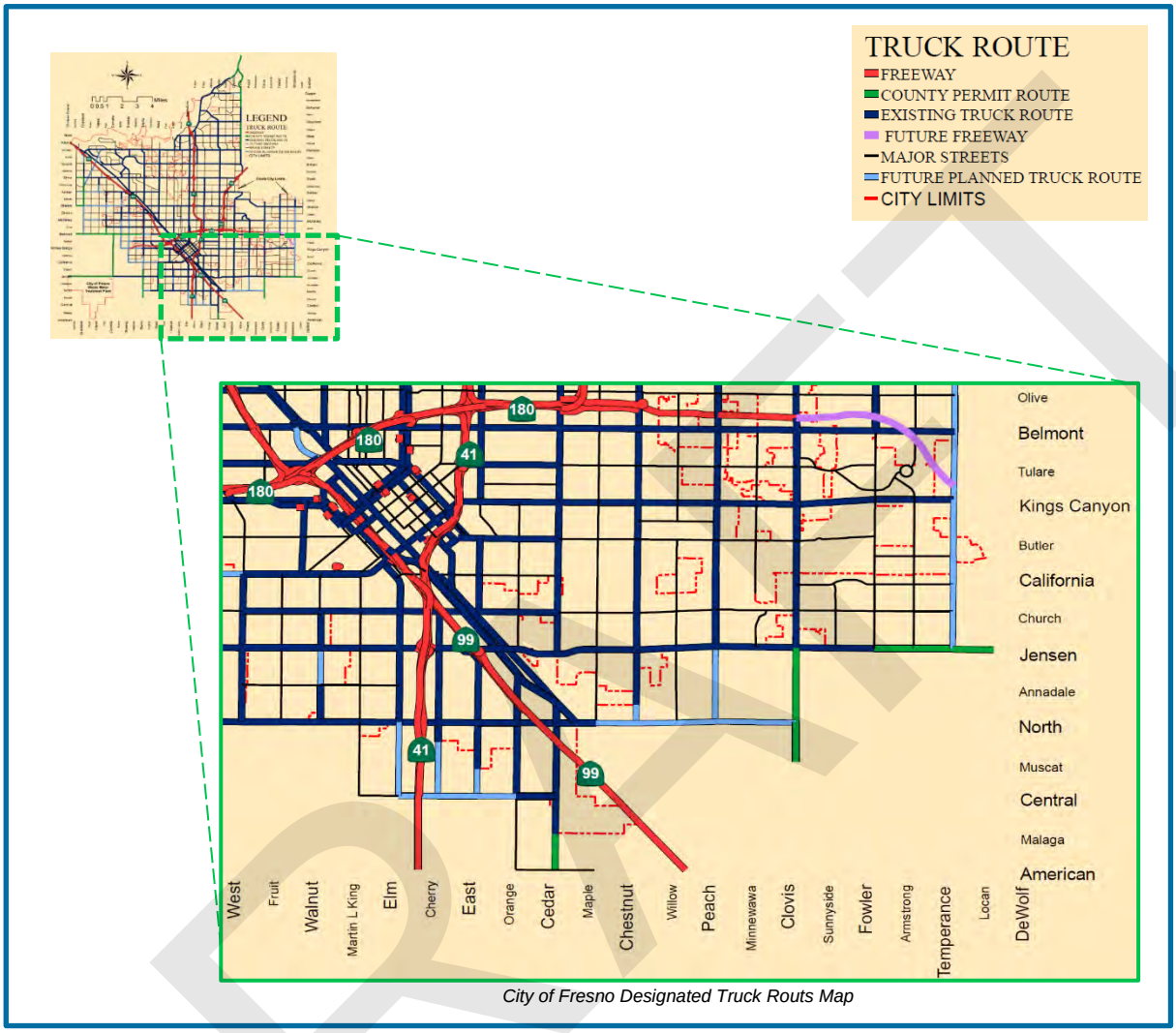
Adams Avenue is a 2-lane collector roadway, approximately 5.25 miles in length within the study area. Speed limit ranges from 50 mph to 55 mph. Adams Avenue accesses northbound SR-99. Adams Avenue is not part of the truck route system.

5.3 Commerce – Local Truck Routes

The project area encompasses a myriad of commercial business of which include Ulta Distribution Center, Amazon Distribution Center, Pepsi Bottling Group, Valley Wide Beverage, Mission Foods, FedEx Ground, FedEx Freight, UPS Freight and several trucking sales and service companies among others.

In order to sustain the movement of goods and services for these sectors, truck route designations were developed. As noted above, the truck route network for highway routes are identified in the Caltrans California Truck Network Maps which align with the project area boundary, SR-99 (to the east) and SR-41(to the west). Additionally, the City of Fresno also identifies a network of truck routes within the city limits as classified in the City of Fresno Designated Truck Routs Map as illustrated on the following page.

Central Avenue and Highway 41



City of Fresno Designated Truck Routs Map

The City of Fresno truck route designation categorizes their system as follows:

- Freeway
- County Permit Route
- Existing Route
- Future Freeway
- Major Streets
- Future Planned Truck Route

As noted in the City of Fresno Designated Truck Routs Map, truck route access points to SR-99 and SR-41 along east-west corridors include Jensen Avenue and North Avenue. In addition, north-south truck routes consist of Cherry Avenue, East Avenue, Orange Avenue and Cedar Avenue.

Indicated also are future planned truck routes, that look to connect with the existing truck route system. As a note, commercial vehicles exceeding twelve thousand pounds maximum gross weight are restricted to designated truck routes.

5.4 Rail (Freight and Passenger)

Freight

In addition to the highway and local road system as being the primary freight infrastructure for the region, the San Joaquin Valley is also served by two major Class I railroads, BNSF Railway (BNSF) and the Union Pacific Railroad (UP) along with short line and regional railroads including Sierra Northern Railway, California Northern Railroad, Stockton, Terminal and Eastern, Central California Traction, Modesto and Empire Traction Company, San Joaquin Valley Railroad Company and West Isle Line[1]. In total, according to the 2018 California State Rail Plan there are approximately 5,418 of freight rail route miles compared to 175,818 of highway/roadway miles.

2018 California State Rail Plan: Exhibit 2.5

Within the study area, BNSF and Union Pacific are the main lines that provide the primary railway connections between SJV and the national rail network. While trucking is by far the dominant freight transportation mode in the SJV, rail plays a critical role for long-haul movement. One of the biggest advantages of freight rail is the lessening of environmental impacts by removing heavy truck traffic from roadways.

Passenger

Passenger rail service is an alternative mode of travel that provides transportation between metropolitan areas, rural areas and to points of California's borders. Amtrak operates all intercity rail services in the state which are divided into two groups, one, Amtrak long-distance routes and two, state supported routes.

According to 2018 California State Rail Plan, in the SJV Amtrak operates the San Joaquin Route which is a state supported service. The route extends 316 miles between Oakland and Bakersfield and has seen a decrease in ridership since 2013 at 1,195,898 to 2016 at 1,135,424.

Google image: Amtrak – Fresno Area

Within the project area, Amtrak shares the BNSF rail line which connects the Fresno Amtrak station to the Hanford Amtrak station. According to a Fresno Bee article written by Tim Sheehan (November 2018), the 30 mile train ride is

[1] San Joaquin Valley Interregional Goods Movement Plan – Task 9: Final Report, August 2013

the busiest station pair on the San Joaquin Route. Within the project area, the rail line runs north-south between Cedar Avenue and Maple Avenue.

High Speed Rail

According to California High Speed Rail Authority's BuildHSR.com website, the goals of high-speed rail is reducing congestion and pollution, improve mobility, job creation and affordable housing. As California's population continues to increase and the economy continues to grow, high-speed rail is an essential mode of transportation to help facilitate the transportation system. The system would require 4,300 new highway lane miles, 115 additional airport gates and four new airport runways from San Francisco to Los Angeles as additional capacity over the next 50 years, therefore high speed rail would lesson also lesson environmental impacts by removing the additional vehicles on the transportation network.

Recently (early 2019), the Governor scaled back this project to focus on completion of the 171-mile segment between Bakersfield and Merced, which includes the RTTAP study area.

6. Plan Line Data

The Reverse Triangle is positioned to implement multi-modal transportation improvements that will benefit the local communities and facilitate economic developments. A plan line is created based off the general plans of the City and County. According to the GHD's scope of work, a plane line is a statutory document that sets out policy directions for land use planning matters regarding long-term growth and development within geographically determined area, or corridor in this case. This also means that the boundaries and limits of a planned right-of-way, including the future right-of-way of an existing street as it is proposed to be widened and including all lands necessary for the building, widening or maintenance of any road, street, highway or any type of public way which planned right-of-way is based on the general plan of the city[1].

The Cedar Avenue Plan Line consists of mapping the corridor on both sites (east and west) to preserve the right-of-way form incremental growth/encroachment of the corridor. Data for this section were extracted from the general plans provided by the City and County of Fresno, parcel maps from the Fresno County GIS portal and *Fresno Works* provided by the Fresno Council of Governments to identify potentially impacted utility infrastructure located above and below ground along the Cedar Avenue corridor.

6.1 California High Speed Rail

The City of Fresno proposes to build the High Speed Rail Maintenance Facility along the Cedar Avenue corridor between SR 99 and Adams Avenue. It encompasses the entire eastern section of Cedar Avenue, including the existing rail lines. On the western side of Cedar Avenue, between American and Adams Avenue, the proposed facility consumes the right-of-way to accommodate the planned use[2]. According to City of Fresno's *General Plan Land Use and Circulation Map*, heavy industrial land use was identified within City limits for the corridor. Illustrated in the Allocation & Boundaries model in *Fresno Works*, the Cedar Avenue corridor line lies within agricultural land with industrial land use north of the corridor. The overall land use surrounding the corridor and the proposed maintenance facility is illustrated in the Figure 6.1.

Fresno Works stated that the entire site of the HSR is virtually flat minimizing fill or cut

Fresno Works: Expression of Interest for the California High Speed Rail, Heavy Maintenance Facility (2018)

[1] Chapter 15A *OFFICIAL PLAN LINES,* Gilroy (2019)

[2] *Fresno Works: Expression of Interest for the California High Speed Rail, Heavy Maintenance Facility* (2018)

area, presenting an excellent building surface. The overall natural elevation grade differential of the site area is approximately 10 feet, derived from topographic maps from US Geological Survey. Starting along the Burlington Northern Santa Fe (BNSF) right-of-way, the site's northern most area rises four feet in over 1.5 miles to a 290 foot elevation in approximately 1.5 miles, just north of Adams Avenue. There is a gentle east to west cross slope of approximately 3 feet in a 0.25 mile distance at the northern end of the proposed maintenance facility. The widest part of the proposed facility site has a cross slope of 5 feet within the 0.5 miles width. The cross slope of the southern end is relatively flat along the 0.25 miles of Adams Avenue. Since the area has long been utilized for agricultural purposes, the area has left the terrain of the land in a nearly level plane, even in the areas that have transitioned into industrial uses.

FIGURE 6.1

Land Use
- Residential
- Commercial
- Industrial
- Agriculture
- Other
- Sheet Sections
- Roads
- Rail
- Fresno County
- City of Fresno (city limits)
- Sphere of Influence Boundary
- HSR_Maintenance Facility

North Ave
Central Ave
Malaga Ave
American Ave
Jefferson Ave
Lincoln Ave
Clayton Ave
Adams Ave
East Ave
Orange Ave
Cedar Ave
Maple Ave
Chestnut Ave
Willow Ave
99
A
B
C
D
E
F
G
H
I
MALAGA
Malaga Recreation Park
RTTAP BOUNDARY LIMITS

Fresno County
Study Area

Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

N
0 0.1 0.2 0.3 0.4
Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Cedar Avenue Plan Line (Master Sheet)

Project No. 11192258
Date 6/12/2019

Fresno Council of Governments
GHD

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Print date: 27 Aug 2019 - 17:05

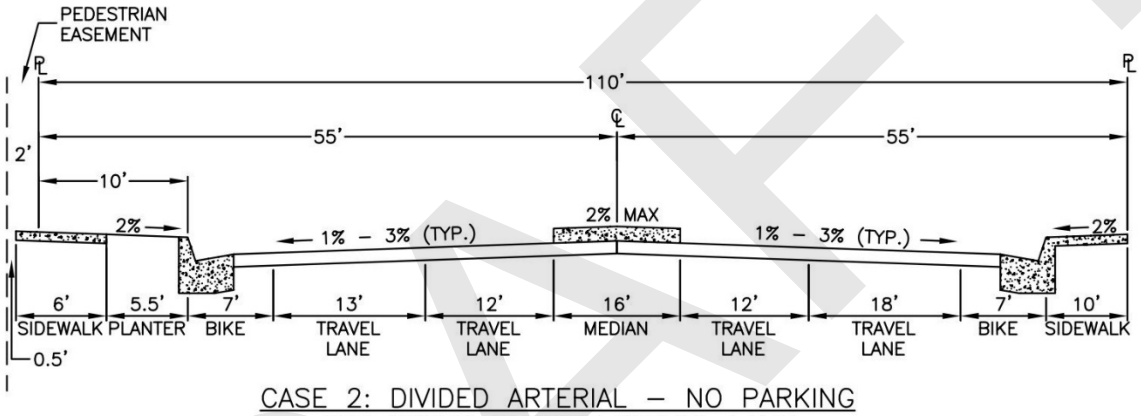
Paper Size ANSI B (portrait)

Data source: GHD 2019, Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

6.2 Transportation Element

The Cedar Avenue corridor is classified as an arterial street[3]. However, the corridor is currently not meeting the City's design standard of an arterial street of 100 feet to 110 feet in total width. In order to conform the City of Fresno's general standards, it is recommended to widen Cedar Avenue. Case 2 standard design of an arterial street is recommended for this corridor because of the industrial and agricultural land use surrounding the Cedar Avenue corridor. A classified Case 2[4] divided arterial street consists of two lanes: a 12-inch lane and an 18-inch wider lane, and a 7-inch class 2 bike facility on both sides of the median. The wider outside lane would allow commercial vehicles to turn safely. More information about class 2 bike facility classification was described in Section 4.1 of this report. An example of a divided arterial street cross section is as shown below:



CASE 2: DIVIDED ARTERIAL – NO PARKING AND WIDER OUTSIDE TRAVEL LANE

6.3 Utilities

Widening the street will potentially affect utilities located above and below the ground infrastructure. Data from the City of Fresno, Fresno County, Fresno Council of Governments, and Pacific Gas & Electric Company were used to help establish all wet and dry utilities. All utility lines are depicted in within the section figures listed in the Appendix.

Wet Utilities

From City of Fresno's *Wastewater Collection System Master Plan*, provided by Brown and Caldwell in 2006, it shows that there is no current sewer system running south of North Avenue along Cedar Avenue. However, at the intersection of North Avenue and Cedar Avenue, it is noted that there is

[3] *General Plan Land Use and Circulation Map (2017)*

[4] *City of Fresno Department of Public Works Standard Drawings (2016)*

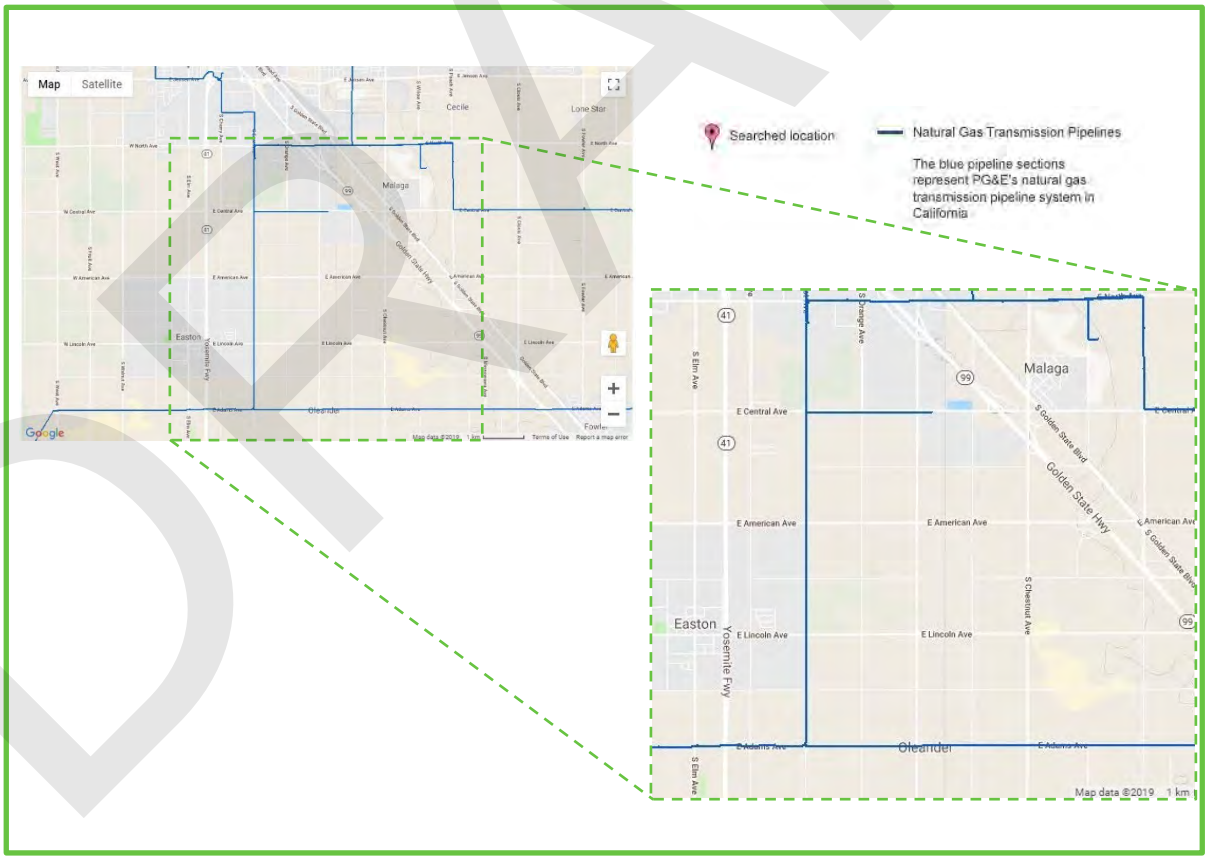
currently a sewer with a diameter of at least 33 inches. *Wastewater Collection System Master Plan* depicts the City's plan of implementing a modeled sewer along Malaga Avenue.

Based on the Utilities model from *Fresno Works*, provided by the County of Fresno, there is currently an 18-inch sewer line running along Central Avenue from Orange Avenue to Cedar Avenue. There is a potential extension of the sewer line along Cedar Avenue from the water line on Muscat Avenue to north of the irrigation canal between Jefferson Avenue and Lincoln Avenue. There is also an existing 14-inch water line running from Parkway Drive down to Malaga Avenue, with a potential extension to north of the irrigation canal between Jefferson Avenue and Lincoln Avenue.

From City of Fresno's *2015 Urban Water Management Plan*, provided by Provost & Pritchard Consulting Group in June 2016, it shows the existing water distribution system in the City of Fresno. As shown, there is currently no water distribution along the Cedar Avenue corridor.

Dry Utilities

According to the interactive map on the Pacific Gas & Electric Company (PG&E) website, there are natural gas pipelines running east-west along the Cedar Avenue corridor. There are currently gas pipelines running through North Avenue, Central Avenue, and Adams Avenue.



Gas Transmission Pipeline Map: https://www.pge.com/

Illustrated in the Utilities model from *Fresno Works*, there are existing power and phone lines running along Cedar Avenue from Parkway Drive to Adams Avenue. Power and phone lines are also running along Central Avenue (Orange Avenue/Maple Avenue), Malaga Avenue (Orange Avenue/Maple Avenue), American Avenue (Orange Avenue/Maple Ave), Jefferson Avenue (Orange Avenue/Cedar Avenue), Lincoln Avenue (Orange Avenue/Maple Ave), Clayton Avenue (Orange Avenue/Maple Avenue), and Adams Avenue (Orange Avenue/Maple Avenue).

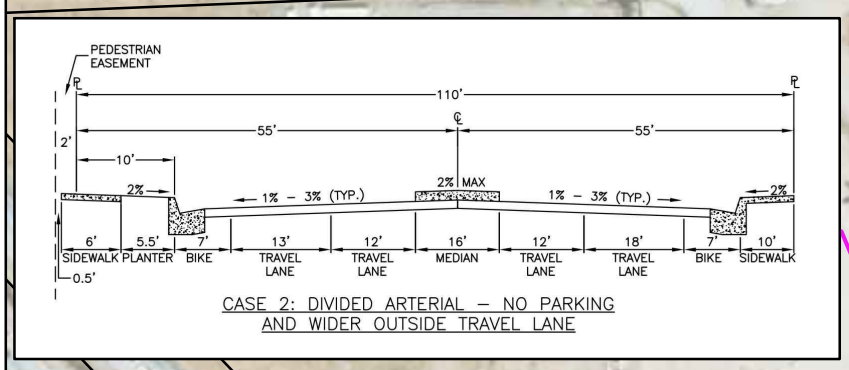
Appendix: Cedar Avenue Plan Line

- Master Sheet Sections

Appendix:
Cedar Avenue Plan Line

Master Sheet Sections A-I

NORTH AVENUE



CASE 2: DIVIDED ARTERIAL – NO PARKING AND WIDER OUTSIDE TRAVEL LANE

330-040-24S

330-040-61
1.07 Ac.

330-040-36S

330-040-37S

330-040-57S
2.71 Ac.

330-021-07T
10.65 Ac.

330-040-60S
3.31 Ac.

330-040-48S
4.20 Ac.

330-040-51S
2.52 Ac.

330-021-05
1.64 Ac.

330-021-06
3.46 Ac.

330-040-14
4.35 Ac.

330-220-01S
1.76 Ac.

330-220-02S

330-060-51
3.05 Ac.

330-220-09S
4.68 Ac.

330-220-08S
4.22 Ac.

330-060-40ST
0.06 Ac.

330-060-58S
0.09 Ac.

330-060-59S
1.90 Ac.

330-060-34ST
3.09 Ac.

330-220-14S
15.53 Ac.

330-060-23S
1.15 Ac.

330-060-22S

330-060-46ST
2.00 Ac.

330-060-44S
1.23 Ac.

CEDAR AVENUE

LEGEND
- UTILITY POLE
- OVERHEAD TELEPHONE LINE
- gs - NATURAL GAS LINE
- CENTERLINE
- w - 14" CITY WATER LINE
- SD - POTENTIAL SEWER LINE EXTENSION
- e - OVERHEAD POWER LINE
- w - POTENTIAL WATER LINE EXTENSION
- sd - CITY 18" SEWER LINE
- HSR MAINTENANCE FACILITY

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

N

GHD

CEDAR AVENUE PLAN LINE
MASTER SHEET-SECTION A
NORTH AVENUE TO MUSCAT AVENUE

Project No. **11192258**
Date **08.02.19**

FIGURE 6.1A

Filename: L:\Prj\2618\2618AT002.dwg Plot Date: 23 August 2019 - 3:35 PM

Source:Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA: Bk. 330-Pg. 02, 04, 06, 22, 23
City of Fresno Public Works Department Standard Drawings, February 2016: Arterial Street Cross-Section P-52
Pacific Gas & Electric Company Gas Transmission Pipeline Map
Fresno Works, May 2018: UTILITIES, ALLOCATION & BOUNDARIES MODEL

MUSCAT AVENUE

330-230-10ST
0.19 Ac.

330-230-09ST
0.04 Ac.

330-230-11ST
0.05 Ac.

330-230-06ST
0.04 Ac.

330-230-02ST
0.34 Ac.

330-230-04ST
0.71 Ac.

330-230-05ST
0.34 Ac.

330-021-15
18.08 Ac.

330-230-01S
7.77 Ac.

330-230-03ST
0.18 Ac.

330-021-16
17.95 Ac.

330-021-02

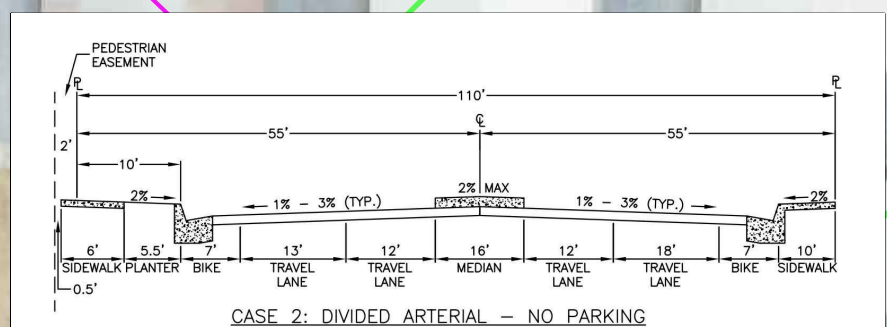
330-021-11ST
51.47 Ac.

330-021-29T
1.74 Ac.

330-021-30
7.42 Ac.

330-021-57
17.85 Ac.

CEDAR AVENUE



CASE 2: DIVIDED ARTERIAL – NO PARKING AND WIDER OUTSIDE TRAVEL LANE

LEGEND

- UTILITY POLE
- NATURAL GAS LINE
- 14" CITY WATER LINE
- OVERHEAD POWER LINE
- CITY 18" SEWER LINE
- OVERHEAD TELEPHONE LINE
- CENTERLINE
- POTENTIAL SEWER LINE EXTENSION
- POTENTIAL WATER LINE EXTENSION
- HSR MAINTENANCE FACILITY

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

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CEDAR AVENUE PLAN LINE
MASTER SHEET-SECTION B
MUSCAT AVENUE TO CENTRAL AVENUE

Project No. **11192258**
Date **08.02.19**

FIGURE 6.1B

Filename: L:\Prj\2618\2618AT002.dwg Plot Date: 23 August 2019 - 3:39 PM

Source:Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA: Bk. 330-Pg. 02, 03, 13, 15, 17, 21
City of Fresno Public Works Department Standard Drawings, February 2016: Arterial Street Cross-Section P-52
Pacific Gas & Electric Company Gas Transmission Pipeline Map
Fresno Works, May 2018: UTILITIES, ALLOCATION & BOUNDARIES MODEL

330-021-56T
0.05 Ac.

CENTRAL AVENUE

330-031-72

330-130-24T
0.02 Ac.

330-130-11S
2.50 Ac.

330-130-12
4.11 Ac.

330-130-25
5.28 Ac.

330-031-69
2.98 Ac.

330-031-71
7.66 Ac.

330-031-89S
2.84 Ac.

330-031-80
7.53 Ac.

330-130-15
20.00 Ac.

330-031-82
11.10 Ac.

330-150-01

330-150-03
1.50 Ac.

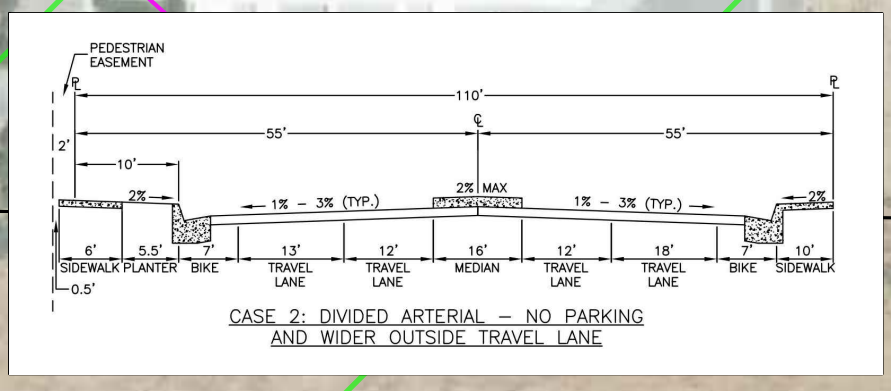
330-031-84
11.75 Ac.

330-150-26
3.33 Ac.

330-150-36
16.16 Ac.

330-031-47
12.44 Ac.

CEDAR AVENUE



CASE 2: DIVIDED ARTERIAL – NO PARKING AND WIDER OUTSIDE TRAVEL LANE

LEGEND

- UTILITY POLE
- OVERHEAD TELEPHONE LINE
- gs - NATURAL GAS LINE
- CENTERLINE
- w - 14" CITY WATER LINE
- SD - POTENTIAL SEWER LINE EXTENSION
- e - OVERHEAD POWER LINE
- w - POTENTIAL WATER LINE EXTENSION
- sd - CITY 18" SEWER LINE
- HSR MAINTENANCE FACILITY

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

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CEDAR AVENUE PLAN LINE
MASTER SHEET-SECTION C
CENTRAL AVENUE TO MALAGA AVENUE

Project No. **11192258**
Date **08.02.19**

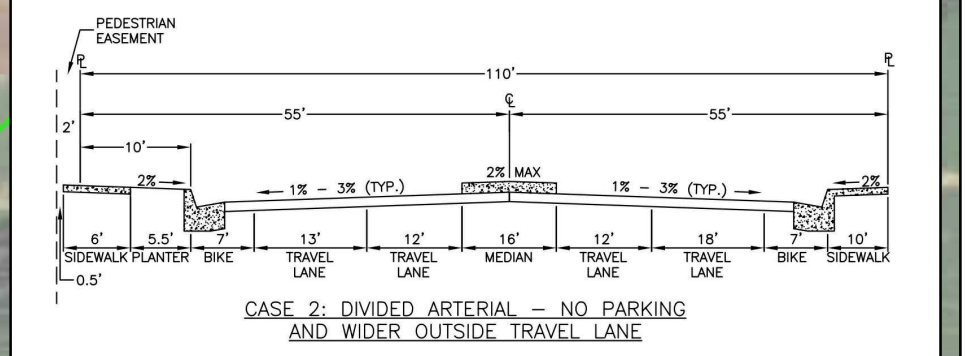
FIGURE 6.1C

Filename: L:\Prj\2618\2618AT002.dwg Plot Date: 23 August 2019 - 3:44 PM

Source:Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA: Bk. 330-Pg. 17, 19, 21, Bk. 334-Pg. 04, 35
City of Fresno Public Works Department Standard Drawings,February 2016: Arterial Street Cross-Section P-52
Pacific Gas & Electric Company Gas Transmission Pipeline Map
Fresno Works, May 2018: UTILITIES, ALLOCATION & BOUNDARIES MODEL

MALAGA AVENUE

330-210-01
330-210-02
330-210-33
2.00 Ac.
330-210-04
1.00 Ac.
330-170-06
15.00 Ac.



CASE 2: DIVIDED ARTERIAL – NO PARKING AND WIDER OUTSIDE TRAVEL LANE

330-210-34
14.83 Ac.
330-210-40
13.31 Ac.
330-170-08
18.12 Ac.
330-170-07
1.43 Ac.
330-210-59
7.84 Ac.
330-190-01
20.00 Ac.
330-210-45
7.62 Ac.
330-190-18
1.00 Ac.
330-190-23
330-210-09
4.00 Ac.
330-210-57
4.21 Ac.

CEDAR AVENUE

LEGEND
- UTILITY POLE
- OVERHEAD TELEPHONE LINE
- gs - NATURAL GAS LINE
- CENTERLINE
- w - 14" CITY WATER LINE
- SD - POTENTIAL SEWER LINE EXTENSION
- e - OVERHEAD POWER LINE
- w - POTENTIAL WATER LINE EXTENSION
- sd - CITY 18" SEWER LINE
- HSR MAINTENANCE FACILITY

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

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CEDAR AVENUE PLAN LINE
MASTER SHEET-SECTION D
MALAGA AVENUE TO AMERICAN AVENUE

Project No. **11192258**
Date **08.02.19**

FIGURE 6.1D

Filename: L:\Prj\2618\2618AT002.dwg Plot Date: 23 August 2019 - 3:43 PM

Source:Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA: Bk. 334-Pg. 07, 25, 32, 33
City of Fresno Public Works Department Standard Drawings, February 2016: Arterial Street Cross-Section P-52
Pacific Gas & Electric Company Gas Transmission Pipeline Map
Fresno Works, May 2018: UTILITIES, ALLOCATION & BOUNDARIES MODEL

330-190-25
15.65 Ac.

330-210-55T
0.16 Ac.

330-210-43
1.11 Ac.

330-210-11T
3.67 Ac.

330-210-12T
1.00 Ac.

330-210-56T
1.34 Ac.

330-210-41T
0.21 Ac.

330-190-24T
0.01 Ac.

330-210-42T
0.30 Ac.

AMERICAN AVENUE

334-350-64T
0.01 Ac.

334-350-55

334-350-56

334-350-63
1.74 Ac.

334-350-65
2.61 Ac.

334-041-35
11.27 Ac.

334-350-62
4.76 Ac.

334-350-28
4.89 Ac.

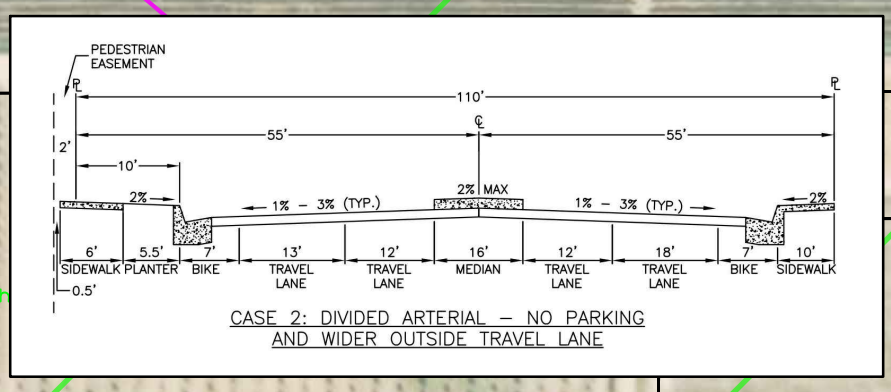
334-350-30

334-350-31

334-350-32
1.89 Ac.

334-041-31S
18.94 Ac.

334-350-33
9.77 Ac.



CASE 2: DIVIDED ARTERIAL – NO PARKING AND WIDER OUTSIDE TRAVEL LANE

334-350-59
35.31 Ac.

CEDAR AVENUE

334-350-57

334-041-29
19.91 Ac.

334-041-28T
17.11 Ac.

LEGEND
- UTILITY POLE
- NATURAL GAS LINE
- 14" CITY WATER LINE
- OVERHEAD POWER LINE
- CITY 18" SEWER LINE
- OVERHEAD TELEPHONE LINE
- CENTERLINE
- POTENTIAL SEWER LINE EXTENSION
- POTENTIAL WATER LINE EXTENSION
- HSR MAINTENANCE FACILITY

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

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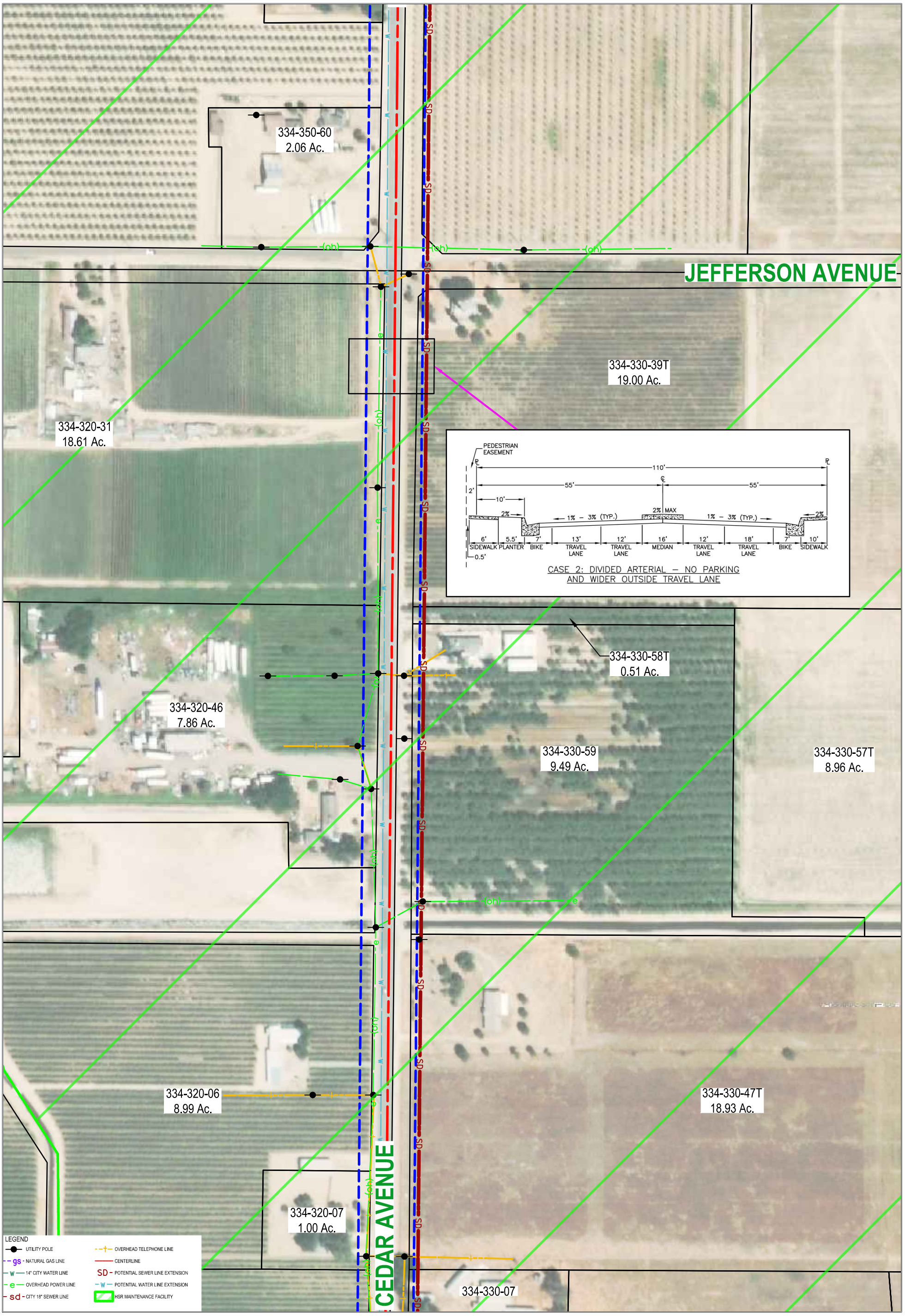
CEDAR AVENUE PLAN LINE
MASTER SHEET-SECTION E
AMERICAN AVENUE TO JEFFERSON AVENUE

Project No. **11192258**
Date **08.02.19**

FIGURE 6.1E

Filename: L:\Prj\2618\2618AT002.dwg Plot Date: 23 August 2019 - 3:46 PM

Source:Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA: Bk. 334-Pg. 07, 25, 30, 31
City of Fresno Public Works Department Standard Drawings, February 2016: Arterial Street Cross-Section P-52
Pacific Gas & Electric Company Gas Transmission Pipeline Map
Fresno Works, May 2018: UTILITIES, ALLOCATION & BOUNDARIES MODEL



REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

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CEDAR AVENUE PLAN LINE
MASTER SHEET-SECTION F
JEFFERSON AVENUE TO
LINCOLN AVENUE

Project No. **11192258**
Date **08.02.19**

FIGURE 6.1F

Filename: L:\Prj\2618\2618AT002.dwg Plot Date: 23 August 2019 - 3:53 PM

Source:Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA: Bk. 334-Pg. 07, 25, 30, 31
City of Fresno Public Works Department Standard Drawings, February 2016: Arterial Street Cross-Section P-52
Pacific Gas & Electric Company Gas Transmission Pipeline Map
Fresno Works, May 2018: UTILITIES, ALLOCATION & BOUNDARIES MODEL

334-330-16

334-330-69
9.23 Ac.

334-320-48
9.94 Ac.

334-330-68T
0.00 Ac.

334-330-63

334-330-66T
2.00 Ac.

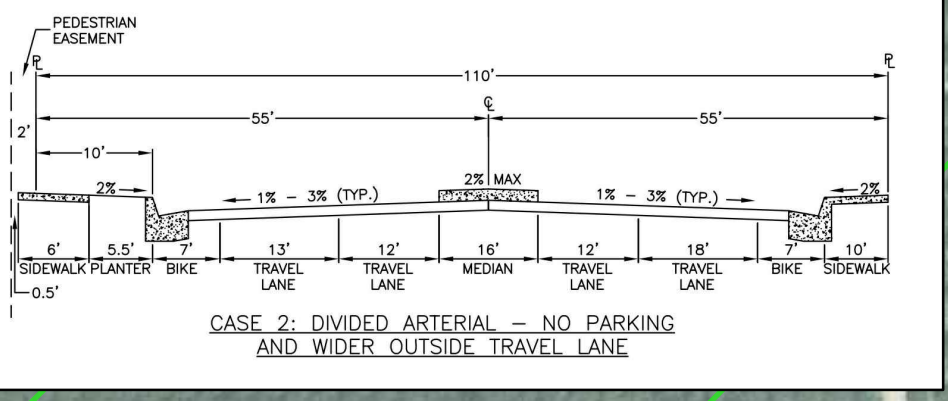
334-330-62T
0.04 Ac.

LINCOLN AVENUE

334-250-81T
2.79 Ac.

334-250-82
12.62 Ac.

334-070-52
9.94 Ac.



CASE 2: DIVIDED ARTERIAL – NO PARKING AND WIDER OUTSIDE TRAVEL LANE

334-070-07
20.00 Ac.

334-250-74
14.90 Ac.

334-250-52T
1.02 Ac.

334-070-11
32.00 Ac.

334-250-65
1.21 Ac.

334-250-23T
0.51 Ac.

334-250-76

334-250-78
12.12 Ac.

CEDAR AVENUE

334-070-09

LEGEND
- UTILITY POLE
- OVERHEAD TELEPHONE LINE
- gs - NATURAL GAS LINE
- CENTERLINE
- w - 14" CITY WATER LINE
- SD - POTENTIAL SEWER LINE EXTENSION
- e - OVERHEAD POWER LINE
- w - POTENTIAL WATER LINE EXTENSION
- sd - CITY 18" SEWER LINE
- HSR MAINTENANCE FACILITY

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

N

GHD

CEDAR AVENUE PLAN LINE
MASTER SHEET-SECTION G
LINCOLN AVENUE TO CLAYTON AVENUE

Project No. **11192258**
Date **08.02.19**

FIGURE 6.1G

Filename: L:\Prj\2618\2618AT002.dwg Plot Date: 23 August 2019 - 3:55 PM

Source:Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA: Bk. 334-Pg. 07, 25, 30, 31
City of Fresno Public Works Department Standard Drawings, February 2016: Arterial Street Cross-Section P-52
Pacific Gas & Electric Company Gas Transmission Pipeline Map
Fresno Works, May 2018: UTILITIES, ALLOCATION & BOUNDARIES MODEL

334-070-10
1.01 Ac.

334-070-08
4.50 Ac.

334-250-72
15.96 Ac.

CLAYTON AVENUE

334-300-38
1.86 Ac.

334-300-39
3.14 Ac.

334-310-01
7.17 Ac.

334-310-45
1.00 Ac.

334-310-68
1.00 Ac.

334-300-32
4.83 Ac.

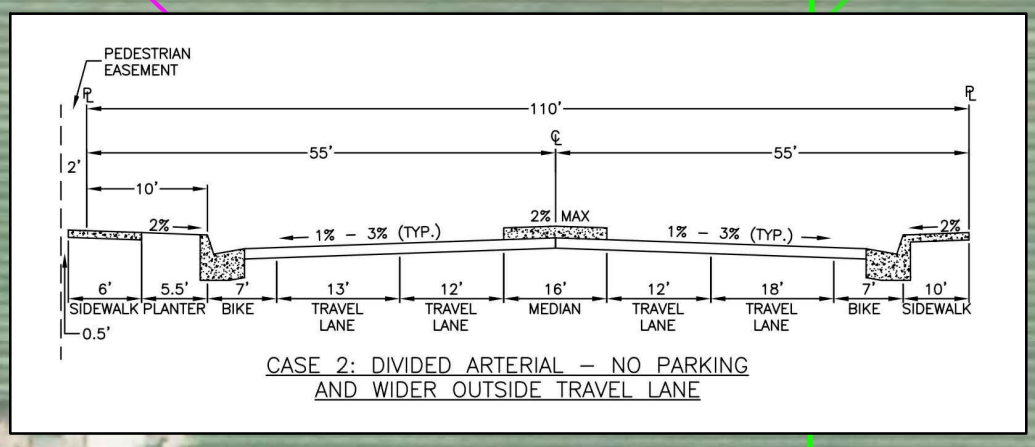
334-310-51
6.48 Ac.

334-310-67T
4.78 Ac.

334-300-29
1.04 Ac.

334-310-50
1.00 Ac.

334-300-34
22.73 Ac.



CASE 2: DIVIDED ARTERIAL – NO PARKING AND WIDER OUTSIDE TRAVEL LANE

334-300-42
1.38 Ac.

334-310-71
28.59 Ac.

CEDAR AVENUE

334-300-43
1.26 Ac.

LEGEND
- UTILITY POLE
- NATURAL GAS LINE
- 14" CITY WATER LINE
- OVERHEAD POWER LINE
- CITY 18" SEWER LINE
- OVERHEAD TELEPHONE LINE
- CENTERLINE
- POTENTIAL SEWER LINE EXTENSION
- POTENTIAL WATER LINE EXTENSION
- HSR MAINTENANCE FACILITY

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

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CEDAR AVENUE PLAN LINE
MASTER SHEET-SECTION H
CLAYTON AVENUE TO ADAMS AVENUE

Project No. **11192258**
Date **08.02.19**

FIGURE 6.1H

Filename: L:\Prj\2618\2618AT002.dwg Plot Date: 23 August 2019 - 3:57 PM

Source:Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA: Bk. 334-Pg. 07, 25, 30, 31
City of Fresno Public Works Department Standard Drawings, February 2016: Arterial Street Cross-Section P-52
Pacific Gas & Electric Company Gas Transmission Pipeline Map
Fresno Works, May 2018: UTILITIES, ALLOCATION & BOUNDARIES MODEL

334-310-34

334-300-50
35.55 Ac.

334-310-21
1.00 Ac.

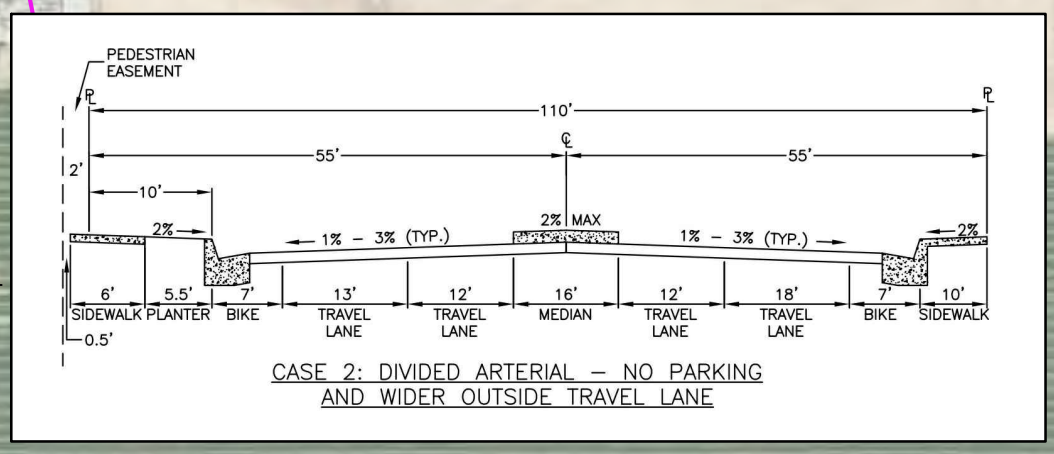
334-310-60
12.83 Ac.

334-310-59T
3.06 Ac.

334-300-49T
0.01 Ac

ADAMS AVENUE

CEDAR AVENUE



CASE 2: DIVIDED ARTERIAL – NO PARKING AND WIDER OUTSIDE TRAVEL LANE

LEGEND

- UTILITY POLE
- gs - NATURAL GAS LINE
- w - 14" CITY WATER LINE
- e - OVERHEAD POWER LINE
- sd - CITY 18" SEWER LINE
- OVERHEAD TELEPHONE LINE
- CENTERLINE
- SD - POTENTIAL SEWER LINE EXTENSION
- w - POTENTIAL WATER LINE EXTENSION
- HSR MAINTENANCE FACILITY

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

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CEDAR AVENUE PLAN LINE
MASTER SHEET-SECTION I
ADAMS AVENUE

Project No. **11192258**
Date **08.02.19**

FIGURE 6.1I

Filename: L:\Prj\2618\2618AT002.dwg Plot Date: 23 August 2019 - 3:58 PM

Source:Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA: Bk. 334-Pg. 07, 25, 30, 31
City of Fresno Public Works Department Standard Drawings, February 2016: Arterial Street Cross-Section P-52
Pacific Gas & Electric Company Gas Transmission Pipeline Map
Fresno Works, May 2018: UTILITIES, ALLOCATION & BOUNDARIES MODEL

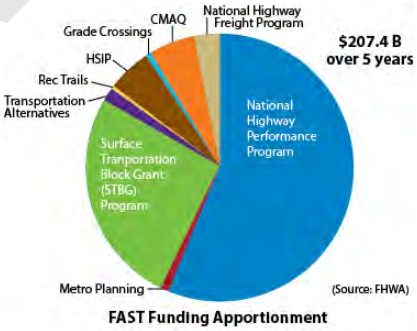
7. Overview of Funding Opportunities

Funding opportunities for infrastructure projects are generally categorized into grants and loans available from the federal, State, or local agency (county or city) level of government, from fees or assessments in a particular district or jurisdiction, and private funding organizations. Government funding is often competitive and recurring on a regular basis, while fees and assessments are continuous over a period of time, and private funding is usually narrowly-focused and highly selective based on the focus of the granting organization.

7.1 Federal Summary

Given the political divisions among the Legislative and Executive branches of government at the federal level, funding opportunities have changed significantly from just a few years ago. Congressionally-directed spending—commonly referred to as earmarks—was once used extensively to channel funding to priority projects in congressional districts, and funding was made available for a greater array of issues, such as historic preservation of structures. The current environment in Washington, D.C., however, is toward a consolidation of funding programs—particularly in the infrastructure arena—and tightening of discretionary spending programs. Below are several categories of federal funding and applicability to the project:

- **Transportation.** Federal transportation policy and funding is provided in authorization legislation passed by Congress. Usually these authorizations are multi-year bills covering a wide array of funding programs. The current authorization bill—the Fixing America's Surface Transportation Act, or FAST Act—was approved by Congress and signed by the President in December 2015. The FAST Act authorized $305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. Many times, there is a delay in approving a new authorization bill and Congress approves a Continuing Resolution which keeps the existing law in place for a certain period of time.



FAST Funding Apportionment

  A significant portion of federal transportation funding provided under the FAST ACT is distributed by the Department of Transportation and its various sub-agencies through the California Department of Transportation (Caltrans). Caltrans works with local agencies, including regional planning organizations, counties, cities, transit districts, and others to facilitate the distribution of funding to the local level. It is important to note that federal funding requires project proponents to comply not only with State environmental law but with the National Environmental Protection Act as well, often increasing project delivery timeframes and resources need to deliver that project.

- **Housing and Community Development.** Congress makes funding available for various housing and community development purposes through appropriations bills. The Department of Housing and Urban Development (HUD) helps to create strong sustainable, inclusive communities, as well as assistance with quality affordable housing, but supporting home

ownership, access to affordable housing free from discrimination, and community development. The tools used by HUD to support these efforts—and largely distributed through states—include the Community Development Block Grant (CDBG) program and HOME Investment Partnerships Program.

A second federal agency charged with community development is the United States Department of Agriculture (USDA), through its Rural Development area, which provides assistance for rural communities, residents and businesses. The USDA provides critical infrastructure investments through its Rural Utilities Service, which includes water and wastewater, community facilities, broadband and telecommunications connectivity, and rural electrification.

- **Other Categories.** Congress and the Executive Branch also make funding available for other priorities and for targeted priorities within the categories already mentioned. As an example, several years ago, the American Recovery and Reinvestment Act was approved, which provided funding in a variety of areas to assist with the economic downturn.

7.2 State Summary

Given the strained finances at the State level over the last decade, very little funding is made available from the State's General Fund for infrastructure and other community development projects. The majority of funding the State administers comes in the form of pass-through funds from the federal government and bond funds from ballot measures approved by voters.

- **Transportation.** Caltrans works in coordination with the California Transportation Commission in allocating funds toward transportation projects in the State. In addition to the federal transportation funds distributed through Caltrans, there are various other sources of funding available disbursement and awarding for projects. These sources include the State fuel excise tax, motor vehicle fees, State sales tax, and Proposition 1B bond funds.

  Particularly relevant to the Fresno Council of Governments is the Active Transportation Program (ATP), which was established following the consolidation of several funding activities at the federal level. In 2013, the Legislature passed and the Governor signed two pieces of legislation establishing the ATP—Senate Bill 99 and Assembly Bill 101. The ATP combines all or portions of several State programs, including Safe Routes to School, Recreational Trails, Bicycle Transportation Account (BTA), and Environmental Enhancement and Mitigation (EEM), and is focused on encouraging increased use of active modes of transportation, such as bicycling and walking.

  The ATP is administered by the CTC, with some of the funding being channeled through the State's Metropolitan Planning Organizations (MPOs). The next ATP call-for-projects, which will be the 5th Cycle of the program, is anticipated to be announced in spring 2020.

  The State continues to have stand-alone Recreational Trails and EEM program. The Natural Resources Agency administers the EEM program, which awards up to $7 million each year for projects that contribute to mitigation of the environmental effects of transportation facilities. The Department of Parks and Recreation (DPR) administers the Recreational Trails Program,

which awards approximately $1.7 million annually to support the construction of new trails, trail expansions, trail renovations, and trail amenities. DPR anticipates issuing a request for proposals for the Recreational Trails Program in 2020.

For projects aimed at addressing safety issues, the State provides federal funding through the Highway Safety Improvement Program (HSIP). In previous years, there also was the High Risk Rural Roads (HR3) Program as a set-aside program, but that is now part of the HSIP Program. The purpose of this program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal land.

The State provides funding for planning activities related to transportation under the Transportation Planning Grant Program. This program contains separate priority areas, including Partnership Planning for Sustainable Communities, Transit Planning for Sustainable Communities, and Transit Planning for Rural Communities, Environmental Justice, and Community-Based Transportation Planning. These programs are designed for applicants who are trying to address various access, connectivity, and other planning issues in their community. Caltrans anticipates a call-for-projects for the Transportation Planning Grant Program in September 2019.

The Congestion Mitigation and Air Quality (CMAQ) Program funds transportation projects or programs that will contribute to attainment or maintenance of the standards for ozone and carbon monoxide, and can be used in particulate matter nonattainment and maintenance areas. All projects and programs eligible for CMAQ funds must come from a conforming transportation plan and be included in a regional agency's Transportation Improvement Plan. This program funds a wide variety of activities, including bicycle and pedestrian projects, transit projects, and outreach and ridesharing activities. The FAST Act reauthorized this program through 2020.

Additionally, in 2017, the State legislature enacted The Road Repair and Accountability Act (SB 1), which is projected to raise $54 billion over 10 years to support transportation projects across the State. The legislation levies new sales and excise taxes on fuel and creates new vehicle fees that are indexed for inflation. Revenues from SB 1 will augment several existing transportation funding programs, such as ATP described above, and also creates additional programs, including the Local Partnership Program, the Trade Corridor Enhancement Program, and the Local Streets and Roads Program.

- **Housing and Community Development.** The California Housing and Community Development Department (HCD) administers multiple programs that award loans and grants for the construction, acquisition, rehabilitation and preservation of affordable rental and ownership housing, homeless shelters and transitional housing, public facilities and infrastructure, and the development of jobs for lower income workers. The majority of funding available through HCD comes from the federal government through programs such as CDBG, while funding for State-only programs has traditionally come from ballot measures approved by voters.

The CDBG program funds a wide variety of areas geared toward the development of communities by providing decent housing and a suitable living environment, and through expanding economic opportunities. In the past, projects ranging from water infrastructure, community-centered facilities, and recreation programs have all been successful. This program requires working closely with other jurisdictions and stakeholders to identify and prioritize projects to secure the limited funding available each year.

- **Other Categories.**

Over the past few years, the State has been developing funding opportunities for a wider array of activities and projects. These newer or innovative opportunities reflect ways the State can use funding or other financial assets to make investments in projects, including community planning and improvements.

  - **Sustainability and Strategic Planning.** The Strategic Growth Council (SGC) brings together agencies and departments within the Business, Consumer Services and Housing Agency, Transportation Agency, Resources Agency, Health and Human Services Agency, Department of Food and Agriculture, and Environmental Protection Agency, with the Governor's Office of Planning and Research to coordinate activities that support sustainable communities emphasizing strong economies, social equity and environmental stewardship. Over the past few years, the SGC has focused their funding on sustainable planning and urban greening efforts.

  - **Cap and Trade.** Proceeds from the Cap-and-Trade Program support a wide range of programs and projects that reduce greenhouse gas emissions and deliver major economic, environmental and public health benefits, including meaningful benefits to the most disadvantaged communities, low-income communities, and low-income households. Cap-and-trade-funded programs are collectively known as California Climate Investments (CCI) and support a range of project types, including transportation, housing, and energy efficiency. CCI programs include the Affordable Housing and Sustainable Communities Program (AHSC), which is administered by the SGC and supports housing, transportation, and land preservation projects to support infill and compact development that reduce greenhouse gas emissions.

  - **Recycled Materials.** The Department of Resources, Recycling and Recovery (CalRecycle) combines the State's recycling and waste management programs and continues a tradition of environmental stewardship. The vision of CalRecycle is to inspire and challenge Californians to achieve the highest waste reduction, recycling and reuse goals in the nation. CalRecycle offers a variety of different programs to further its goals, including programs that incentivize the use of recycled tires. One of the primary uses of this funding is often for road and parking lot paving.

  - **Other Infrastructure.** The California Infrastructure and Economic Development Bank (I-Bank) finances public infrastructure and private development that promote a healthy climate for jobs, contribute to a strong economy, and improve the quality of life in California communities, and is now a part of the Governor's Office of Business and Economic Development. The I-Bank has extremely broad statutory powers to issue revenue bonds, make loans and provide credit enhancements for a variety of projects. Among the I-Banks offerings are loans at low interest rates and bonds linked to a revenue source for projects categories including streets and highways, drainage, water supply and flood control, parks and recreational facilities, public transit, sewage collection and treatment, among others.

7.3 Local Summary

At the local level, funding and assistance is either provided from a distribution of federal and State disbursements or through locally-approved taxes. The following local agencies will be intimately involved in the planning for this project.

- **Fresno Council of Governments.** The Fresno Council of Governments (Fresno COG) is made up of the County of Fresno and its fifteen incorporated cities. Fresno COG's primary functions are transportation planning and programming. The association also assists local jurisdictions in obtaining federal assistance, reviewing and coordinating applications for programs utilizing federal funding, and providing a clearinghouse for the coordination and review of all State-funded projects. For planning and funding distribution purposes, Fresno COG is the federally-designated Metropolitan Planning Organization for Fresno County and a state-designated Regional Transportation Planning Agency. In addition to coordinating federal transportation funds, Fresno COG administers the voter-approved Measure C local sales tax for transportation projects.

  Measure C is a ½-cent transportation sales tax first approved in 1986, and again in 2006. In its first 20 years, Measure C delivered more than $1 billion of improvements to state highways, county roadways and city streets, along with the construction of over 50 new lanes of Freeway throughout the County. The Measure is expected to raise an additional $1.2 billion through 2027, which Fresno COG will continue to oversee and administer. In addition to being stand-alone funding for many local projects, Measure C funds are also often used as matching funds to leverage State and federal funds for larger projects. Funds from Measure C revenues can also be used in place of other local, State or federal funding, thus freeing up those funds for other purposes and projects.

- **County of Fresno.** Regardless of funding source, the County of Fresno will play a key role in securing, administering and carrying out projects in the project area as the County receives the local share of the State tax on gasoline. Given the nature of gasoline usage, these funds often fluctuate, so the County will usually program a set of projects over a number of years in an attempt to create a steady flow of funding for the timely completion of those projects. It is not unusual, however, for additional projects to be proposed for funding and either replace projects on the list, or take advantage of project timelines to utilize funding earlier than planned.

  The County of Fresno also receives the CDBG funds from HUD discussed previously. This funding is made available each year for allocation to various local programs and communities.

8. Assessment and Fees Summary

The assessment of fees or special taxes is also very useful in not only constructing infrastructure improvements, but also in the long-term maintenance and upkeep of those improvements. Included below is a discussion of existing means of financing through such districts, as well as current proposed initiatives.

- **Assessment District.** An assessment or maintenance district is created to finance improvements when other sources of funding are limited. These districts are often formed in undeveloped or unincorporated areas and are used to build and maintain roads and water and sewer systems—sometimes for new homes or commercial space—but may also be used in older areas to finance new public improvements or other additions to the community. An assessment district is created by a sponsoring local government agency and begins with a petition signed by owners of the property who are in need of the proposed public improvements. The proposed district will include all properties that will directly benefit from the improvements to be constructed or maintained. A public hearing is held, at which time the property owners have the opportunity to protest the assessment district. Once approved, property owners have the opportunity to prepay the assessment prior to bond issuance. After this cash payment period is over, a Special Assessment Lien is recorded against each property with an unpaid assessment. Then, these parcels will pay for their total assessment through annual installments on the county property tax bill. The property owners will have the right to prepay the remaining balance of the assessment at any time, including applicable prepayment fees.

  By law, the assessment cannot be directly based on the value of the property. Instead, the assessments are based on mathematical formulas that take into account how much each property will benefit from the installation of the improvements. Each parcel in the assessment district becomes responsible for a fixed percentage of the total district debt, and pays that portion of the principal and interest due on the bonds each year. Bond issues are normally structured so the amount of the annual installment remains relatively level. If bonds were issued by the assessment district, installments will be charged annually until the bonds are paid off in full. Normally, the term of the bonds is 15 to 20 years.

- **Enhanced Infrastructure Financing District.** Enhanced Infrastructure Financing Districts (EIFDs) were established by the State legislature in 2014 with the passage of SB 628, following the dissolution of Redevelopment Agencies (RDAs) in 2012. SB 628 updated an existing Infrastructure Finance District (IFD) law, approved in 1990, by expanding the types of projects that can be funded with EIFDs and lowering voter approval requirements. The 1990 version of IFDs was rarely used in part because it required 2/3 approval from voters to form an IFD.

  EIFDs are a new governmental entity created by a city, county, special district (or a combination of the three) that funds the construction, improvement, or rehabilitation of a defined area. EIFDs are formed through a joint power authority (JPA) and consist of cooperating cities (or a single city), counties, and special districts. Unlike their IFD predecessors, a public vote is not required to form an EIFD, though a 55 percent vote is required to issue bonds. EIFDs can be used to finance a wide variety of projects, including infrastructure projects such as roads, bridges, and water facilities; affordable housing and mixed-used developments; transit-oriented development; light rail; and parks and open space.

  A unique feature of EIFDs is that the defined areas of an EIFD do not have to be contiguous and no blight findings are required. This means that cities, counties, and special districts that are separated geographically but share a common infrastructure goal (such as a major arterial highway) can still form an EIFD together. EIFDs can also fund the on-going maintenance associated with the newly formed district.

8.1 Private Source Summary

There also exist a large number of private foundations and corporate entities that provide funding for an extremely broad spectrum of project and activities. Many of these funding opportunities have a narrow policy focus, and often target a specific geographic area. While research and follow up for

this type of funding is time-consuming and intensive, there are potential programs available for many specific categories of need.

Memorandum

August 27, 2019

To:	Fresno Council of Governments	Project:	Fresno Triangle
From:	GHD Inc.	Ref/Job No.:	
CC:		File No.:	Fresno_MEM001.DOCX

Subject: Fresno Triangle: Congestion and Travel Time Reliability Assessment

1. Introduction

This memorandum details the Congestion Level and Travel Time Reliability analysis performed as part of the Fresno Triangle Analysis for the Fresno Council of Governments. This analysis supports FCOG's RCMP which recommends the incorporation of travel time reliability and speed-based congestion measures to support the quantification of both passenger vehicle as well as goods movement performance metrics. It is also consistent with new requirements for State DOTs and MPOs to assess the performance of the Interstate and non-Interstate National Highway System (NHS) per the National Highway Performance Program (NHPP). Specifically, this entails assessing freight movement on the Interstate System; and to assess traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program.

As part of performance management, recipients of Federal-aid highway funds, such as FCOG, would make transportation investments to achieve performance targets that make progress toward the following national goals:

- Congestion reduction: to achieve a significant reduction in congestion on the NHS.
- System reliability: to improve the efficiency on the NHS.
- Freight movement and economic vitality: to improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- Environmental sustainability: to enhance the performance of the transportation system while protecting and enhancing the natural environment.

Data Source and Data Reduction

Per and the National Performance Management Measures Final Rule, the preferred data for complying with the National Highway Performance Program is the National Performance Management Research Data Set (NPMRDS) from FHWA. The NPMRDS provides average speed data (five-minute averaging time) for federally defined roadway segments designated as part of the National Highway System (NHS).

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NPMRDS data for January through December 2018 (12-months) was downloaded for analysis[1]. Given the desire to reflect annual average weekday conditions, the data was filtered to isolate average weekday conditions - Tues-Thurs AM/PM peak periods for passenger vehicles and heavy-duty truck vehicles separately. The AM/PM peak hours between 7:30 AM to 8:30 AM and 4:00 PM and 5:00 PM were analyzed for both passenger vehicles and truck.

A total of 975,597 individual data records were processed, and after filtering the data to isolate average peak hour conditions, 112,578 AM and 109,772 PM peak hour records were analyzed to yield 1120 averaged observations for 140 segments (reflecting both directions of travel) for both passenger vehicles and heavy duty trucks respectively. The only data "cleansing" applied was to filter/remove extreme high speed outliers (e.g., 90+ mph) from the free flow speed, congestion and reliability calculations. All data was processed and summarized based on the NPMRDS segmentation.

Overlay NHS and NPMRDS networks

To report and display the NPMRDS data graphically, NRMRDS segment coordinates were matched and overlaid with the NHS layer.

Performance Measure Definitions (Congestion and Reliability)

Federal definitions from the National Performance Management Measures Rule were used to define congestion and reliability. Both the 80th and 95th percentile travel times were computed. The 95th percentile travel time is consistent with the Highway Capacity Manual 6th Edition and NCHRP Research on Travel Time Reliability. Conversely, the Federal Rule proscribes the 80th percentile. For purposes of this analysis the 95th percentile travel time based BTI statistic was considered more representative and is reported herein. Thresholds reflect heavy congestion (with observed average speed less than 60 percent of the free-flow speed) and unreliable road segments (with an 95th percentile travel time more than 1.5 times longer than the 50th percentile travel time (Level of Travel Time Reliability or LOTTR). Given that Free Flow speed is a key variable for calculating both Congestion Level and LOTTR, free flow speed was empirically estimated for each individual segment using NPMRDS data between the hours of midnight and 3 AM.

Table 1. Congestion and Reliability Thresholds

Congested Conditions	Reliable Travel Time	Moderately Reliable Travel Time	Unreliable Travel Time
Travel Speed	BTI[1] < 0.25	BTI[1] 0.25 - <0.5	BTI[1] > = 0.5
Uncongested[2] (>= 60 % of free-flow)	Predictable and efficient	Not always predictable, but usually efficient	Unpredictable, but not often congested
Congested[2] (< 60% of free-flow)	Predictable and In-efficient	Not always predictable, but usually inefficient	Unpredictable, but often congested

[2] .Level of Travel Time Reliability

[3] .Free flow speeds was estimated for each segment based on NPMRDS data during the hours of midnight and 3 AM

Results

For a given segment, the direction of travel demonstrating the highest congestion or reliability was used as the basis for illustrating/reporting conditions for a given segment for each peak hour respectively. Maps displaying AM/PM peak hour Congestion and LOTTR results for Passenger Vehicles and Heavy-duty Trucks on the designated NHS in Fresno County is provided in Figure 1, Figure 2, Figure 3 and Figure 4 respectively. The congestion results are reflected by the width/thickness of a given segment and reliability by color. .

[1] The National Performance Measurement Rule recommends using 12 months of data to reflect a "true" annual average.

Figure 1. AM Peak Hour Passenger Vehicle Results

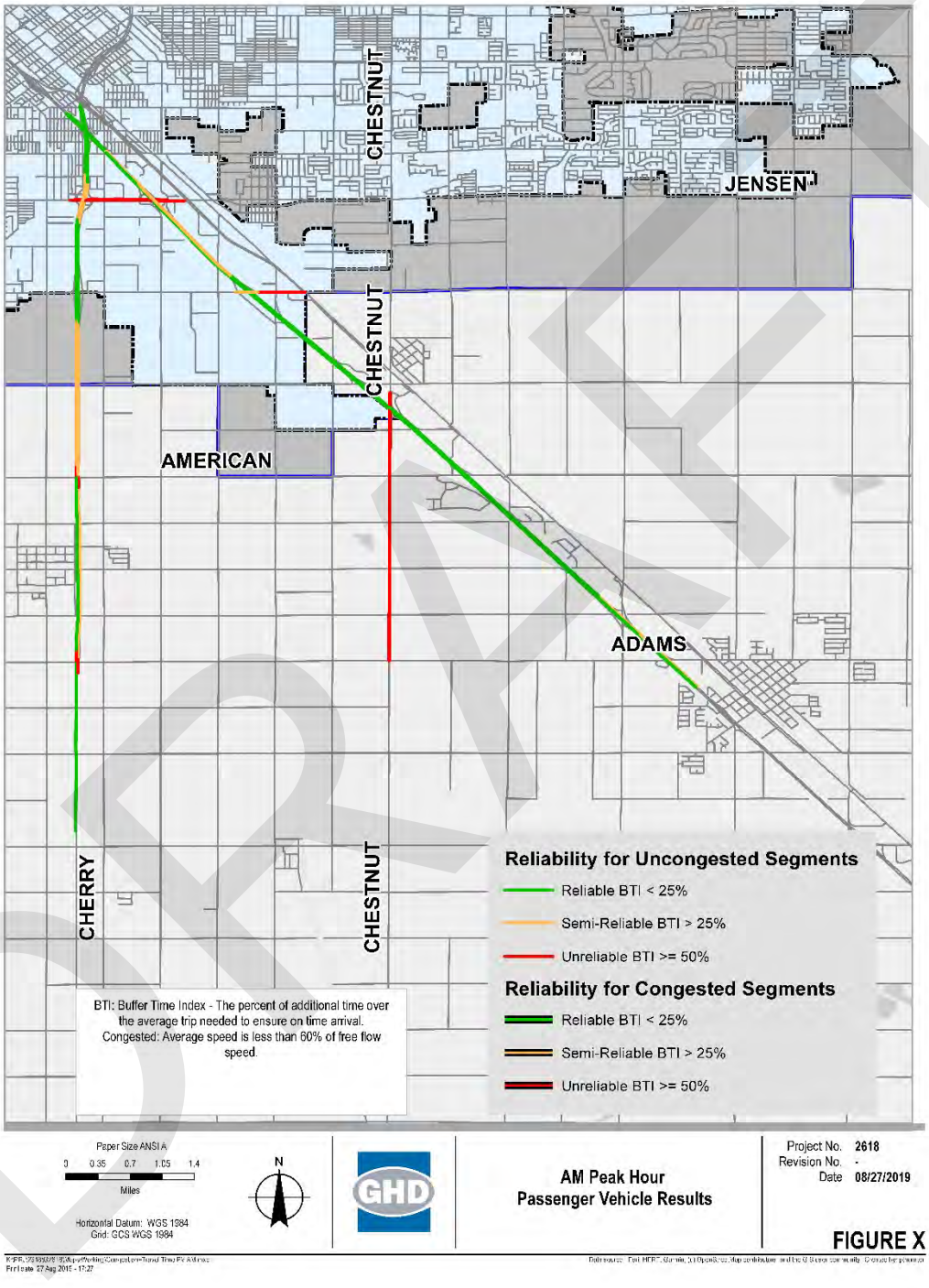


Figure 2. PM Peak Hour Passenger Vehicle Results

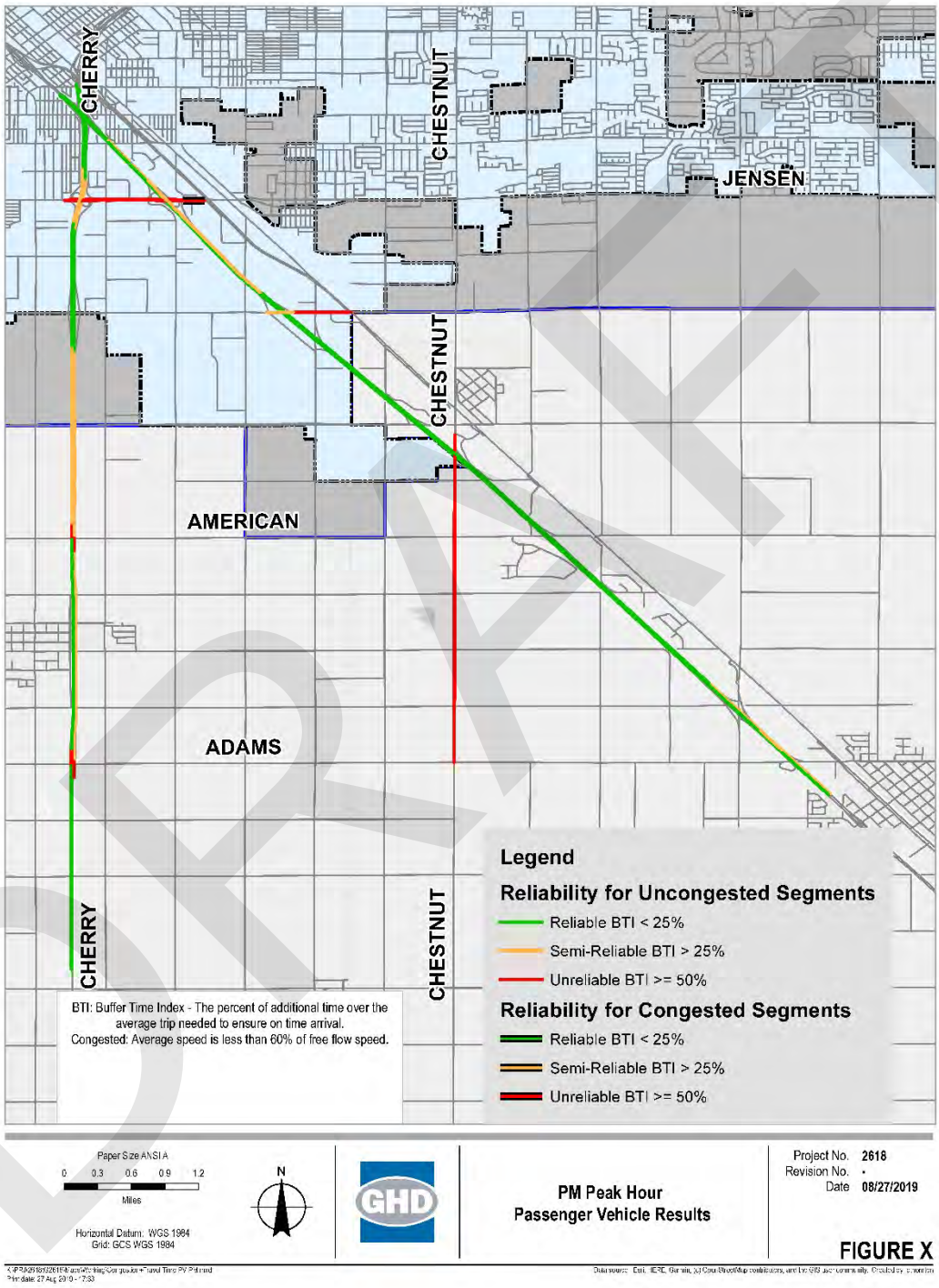


Figure 3. AM Peak Hour Heavy-Duty Truck Results

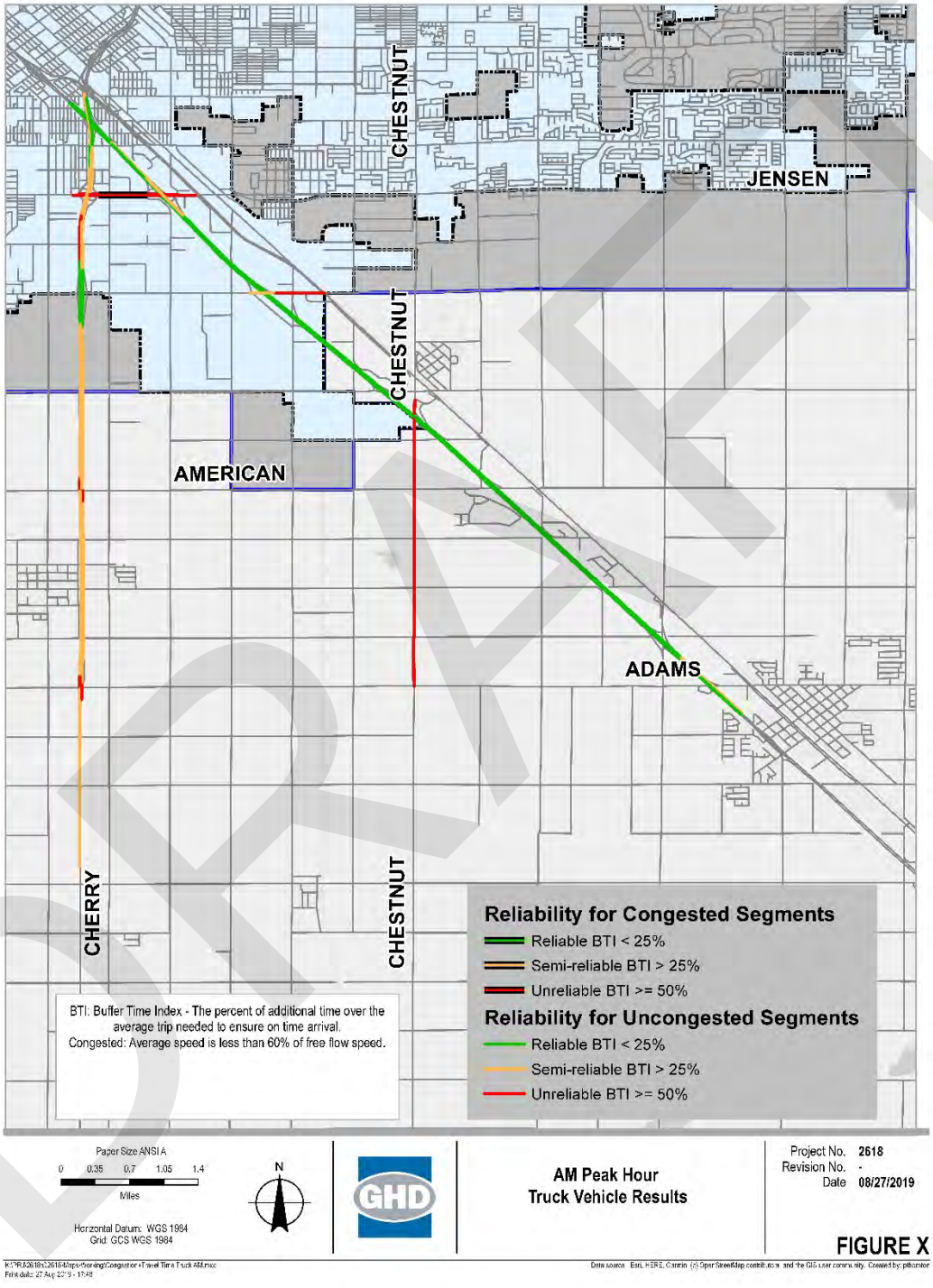
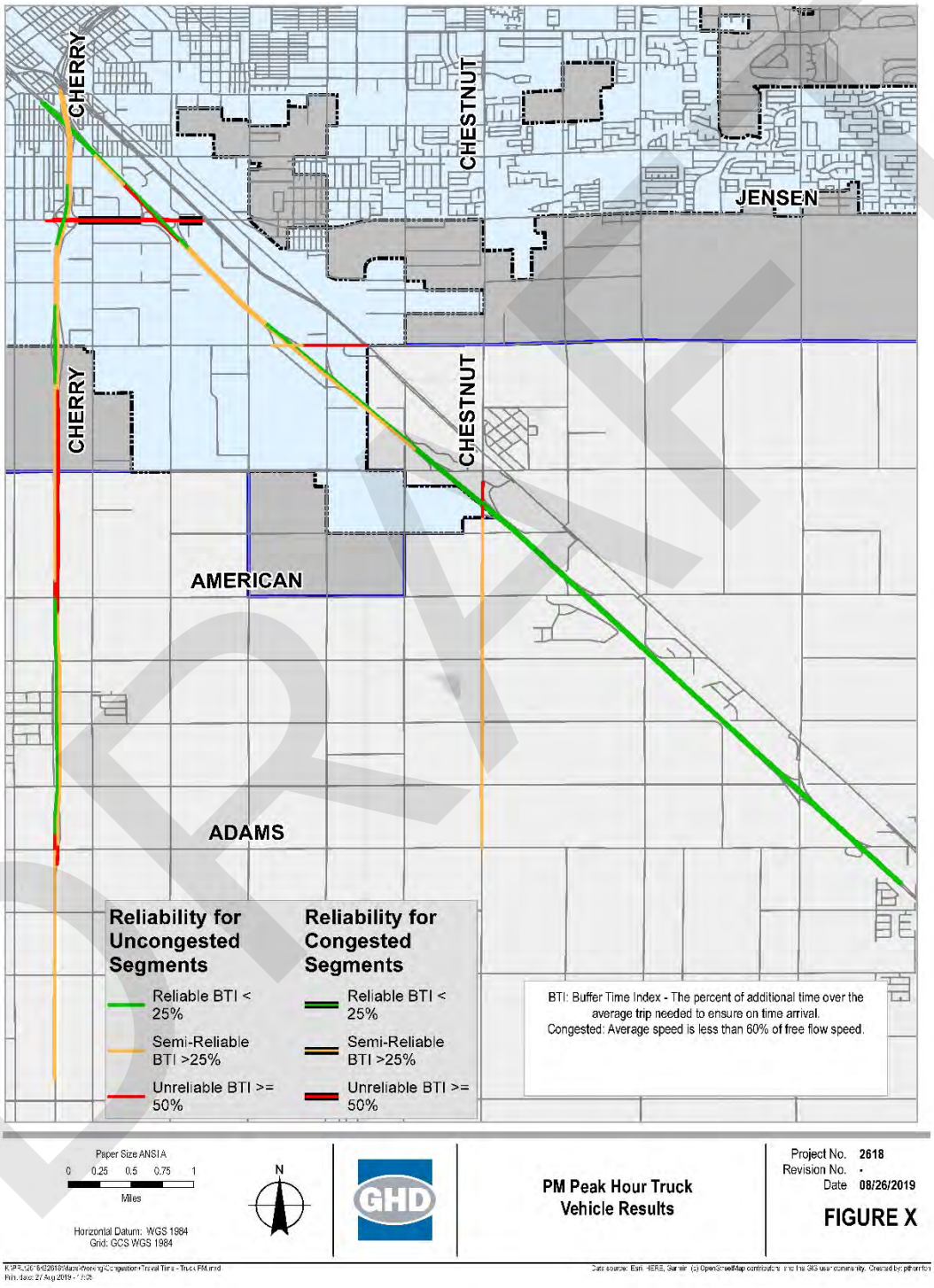


Figure 4. PM Peak Hour Heavy-Duty Truck Results



Reverse Triangle Transportation Area Plan

Existing Conditions Intersection Operations Analysis

Prepared for:

Fresno Council of Governments

Draft for Review

This document is in draft form. A final version of this document may differ from this draft. As such, the contents of this draft document shall not be relied upon. GHD disclaims any responsibility or liability arising from decisions made based on this draft document.

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Table of Contents

Figure Index

Table Index

Appendix Index

1. Introduction

The Fresno Council of Governments (FCOG), in partnership with City of Fresno and County of Fresno has retained GHD to study the impacts from the industrial growth in the Industrial Triangle, or commonly known as the Reverse Triangle areas. The Study Area bounded by State Route 41 (SR-41) to the west, State Route 99 (SR-99) to the east, Church Avenue at the north and Adams Avenue to the south makes up the primary project area. Figure 1 presents the Study Area Map.

This south Fresno region encompasses approximately a 12,000 acres of area and is home to an Amazon e-commerce distribution center, Ulta distribution center and is experiencing new investment and economic growth in the public and private sector. The area is also the potential location for the California High Speed Rail Heavy Maintenance Facility.

GHD has prepared this Existing Conditions (2109) Intersection Operations Analysis (IOA) as part of the data collection process to analyze critical intersections and road segments approved by member agencies, namely the City and County of Fresno and Caltrans. This IOA focuses only on traffic conditions; other mode alternatives modes of travel (pedestrian/bicycle/transit/rail) will be discussed in detail in a separate upcoming report entitled Transportation Impacts Analysis Report (TIAR). The TIAR will also develop projections for a future year analyses and identify potential solutions, complete with planning level cost estimates, benefit/cost (B/C) calculations and prioritized improvements.

FIGURE 1

CITY OF FRESNO

CALWA

MALAGA

EASTON

FOWLER

99

41

Church Ave

Jensen Ave

North Ave

Central Ave

Malaga Ave

American Ave

Jefferson Ave

Lincoln Ave

Clayton Ave

Adams Ave

Sumner Ave

Muscat Ave

Minnewawa Ave

Elm Ave

Cherry Ave

East Ave

Orange Ave

Cedar Ave

Maple Ave

Chestnut Ave

Willow Ave

Peach Ave

Villa Ave

Kenneth Ave

Clovis Ave

Fresno County

Study Area

State Route (Freeway)
Roads
Rail
Fresno County
City of Fresno (city limits)
Sphere of Influence Boundary
Triangle Industrial Study Area
HSR_Maintenance Facility
Fire Station #89
Cherry Avenue Auction
Orange Elementary
Ulta Distribution Center
Amazon Distribution Center

N

0 0.25 0.5 0.75 1

Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Study Area Map

Project No. 11192258

Date 6/12/2019

Fresno Council of Governments

GHD

L:\Prj\2618\G2618\Maps\Working\Study Area Map.mxd
Print date: 14 Jun 2019 - 08:06

Paper Size ANSI B (portrait)

Data source: GHD 2019, Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

2. Project Setting

The following section provides an overview of the roadway circulations setting and study roadways.

2.1 Roadway Circulation Setting

The following roadways provide primary circulation within the Study Area. The following roadway characteristics were attained using FCOG and Fresno County shape file attributes. Figure 2 identifies road classification, speed limit and truck routes within the Study Area.

North – South Alignment

State Route 99 (SR-99) is a major north-south freeway from Bakersfield, CA to Sacramento, CA. Within the study area, SR-99 is a 6-lane divided freeway with a 65 mph posted speed limit. SR-99 is a major good movement corridor.

State Route 41 (SR-41) is a major north-south freeway. Within the study area, SR-41 is a 4-lane divided freeway with a maximum 65 mph posted speed limit. SR-41 is a major good movement corridor.

Cherry Avenue is a 2-lane collector roadway, approximately 5.5 miles in length within the study area. Speed limit ranges from 40 mph to 50 mph. North of Central Avenue to Church Avenue, Cherry Avenue is classified as a truck route. Additionally, Cherry Avenue is the frontage road to Orange Elementary, Cherry Avenue Auction and Fire Station #89.

East Avenue is a 2-lane local and collector roadway, approximately 5.0 miles in length within the study area. North of American Avenue to Jensen Avenue, East Avenue is a collector roadway. Speed limit ranges from 45 mph to 50 mph. North of Central Avenue to Jensen Avenue, Cherry Avenue is classified as a truck route. Additionally, Cherry Avenue is the frontage road to the Ulta Distribution Center.

Orange Avenue is a 2-lane local and collector roadway, approximately 4.5 miles in length within the study area. North of American Avenue to Jensen Avenue (study area limits), Orange Avenue is a collector roadway (and also beyond Jensen Avenue). Speed limit is 50 mph. North of American Avenue to project limits, Orange Avenue is classified as a truck route. Additionally, Orange Avenue is the frontage road to the Amazon Distribution Center.

Cedar Avenue is a 2-lane arterial roadway, approximately 4.0 miles in length within the study area. Speed limit ranges from 40 mph to 50 mph. North of American Avenue to project limits and beyond, Cedar Avenue is classified as a truck route. Cedar Avenue assesses southbound SR-99. Additionally, Cedar Avenue is the proposed frontage road to the High Speed Rail Maintenance Facility.

Maple Avenue is a 2-lane local roadway, approximately 3.25 miles in length within the study area. Speed limit although not identified by the local agencies, should not exceed that of a collector roadway (minimum 40 mph). This roadway is not part of the truck route system.

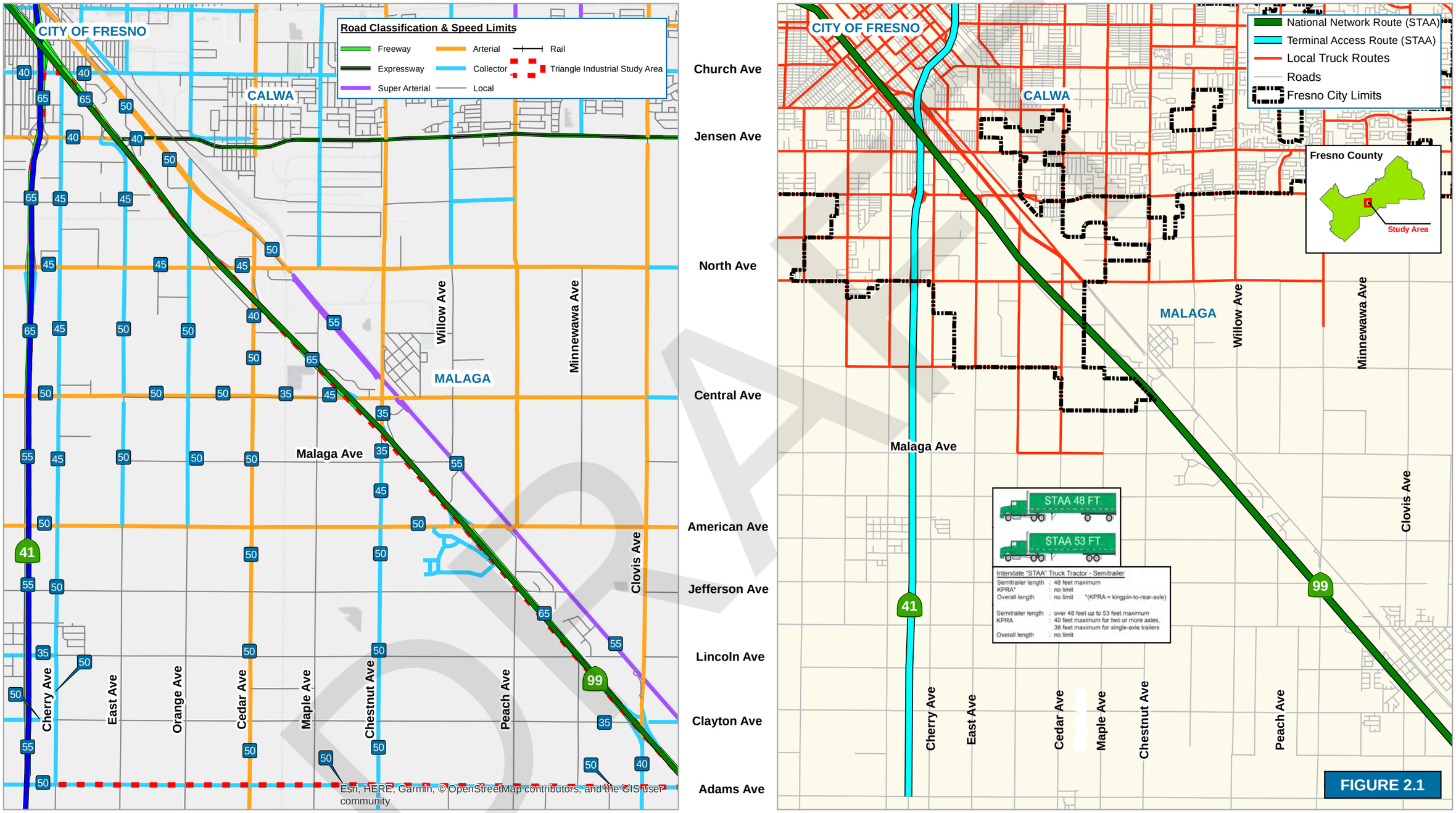


FIGURE 2.1

N

0 0.4 0.8 1.2 1.6

Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Road Classification, Speed Limits and Truck Routes

Project No. 11192258

Date 6/12/2019

Fresno Council of Governments

GHD

L:\Prj\2618\G2618\Maps\Working\Road Classification (landscape).mxd
Print date: 22 Jul 2019 - 11:39

Paper Size ANSI B (Landscape)

Data source: GHD 2019, Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

Chestnut Avenue is a 2-lane collector roadway, approximately 3.0 miles in length within the study area. Speed limit ranges from 35 mph to 50 mph (50 mph in the rural areas, south of American Avenue). Chestnut Avenue assesses southbound SR-99. This roadway is not part of the truck route system.

Peach Avenue is a 2-lane local roadway, approximately 2.0 miles in length within the study area. Speed limit although not identified by the local agencies, should not exceed that of a collector roadway (minimum 40 mph). This roadway is not part of the truck route system.

Minnewawa Avenue is a 2-lane local roadway, approximately 2.0 miles in length within the study area. Speed limit although not identified by the local agencies, should not exceed that of a collector roadway (minimum 40 mph). This roadway is not part of the truck route system.

Clovis Avenue is a 2-lane collector roadway, approximately 0.5 miles in length within the study area. North of State Route 99, Clovis Avenue is an arterial 4-lane arterial roadway. Speed limit within project area is 40 mph. Clovis Avenue accesses SR-99.

East – West Alignment

Church Avenue is a 2-lane collector roadway, approximately ¼ of a mile in length within the study area. Speed limit is 50 mph. This roadway is part of the truck route system.

Jensen Avenue is a 4-lane arterial roadway with two-way left-turn lane (TWLTL), approximately 1.0 mile in length within the study area. Speed limit is 40 mph. Jensen Avenue accesses both SR-99 and SR-41. This roadway is part of the truck route system.

North Avenue is a 4-lane arterial roadway with two-way left-turn lane (TWLTL), approximately 2.0 miles in length within the study area. Speed limit is 45 mph. North Avenue connects to SR-41. This roadway is part of the truck route system.

Central Avenue is a 2-lane arterial roadway, approximately 2.5 miles in length within the study area. Speed limit ranges from 35 mph to 50 mph. Central Avenue accesses SR-41. West of Cedar Avenue, this roadway is part of the truck route system.

American Avenue is a 2-lane arterial roadway, approximately 2.5 miles in length within the study area. Speed limit ranges from 35 mph to 50 mph. American Avenue accesses northbound SR-99 and is partially included in the truck route system (between Orange Avenue and Maple Avenue).

Jefferson Avenue, Lincoln Avenue and Clayton Avenue are 2-lane local roadways, ranging in approximately 2.5 to 3.5 miles in length within the study area. Speed limit although not identified by the local agencies, should not exceed that of a collector roadway (minimum 40 mph). These roadways are not part of the truck route system.

Adams Avenue is a 2-lane collector roadway, approximately 5.25 miles in length within the study area. Speed limit is 50 mph. Adams Avenue accesses northbound SR-99. Adams Avenue is not part of the truck route system.

2.1.1 Study Intersections

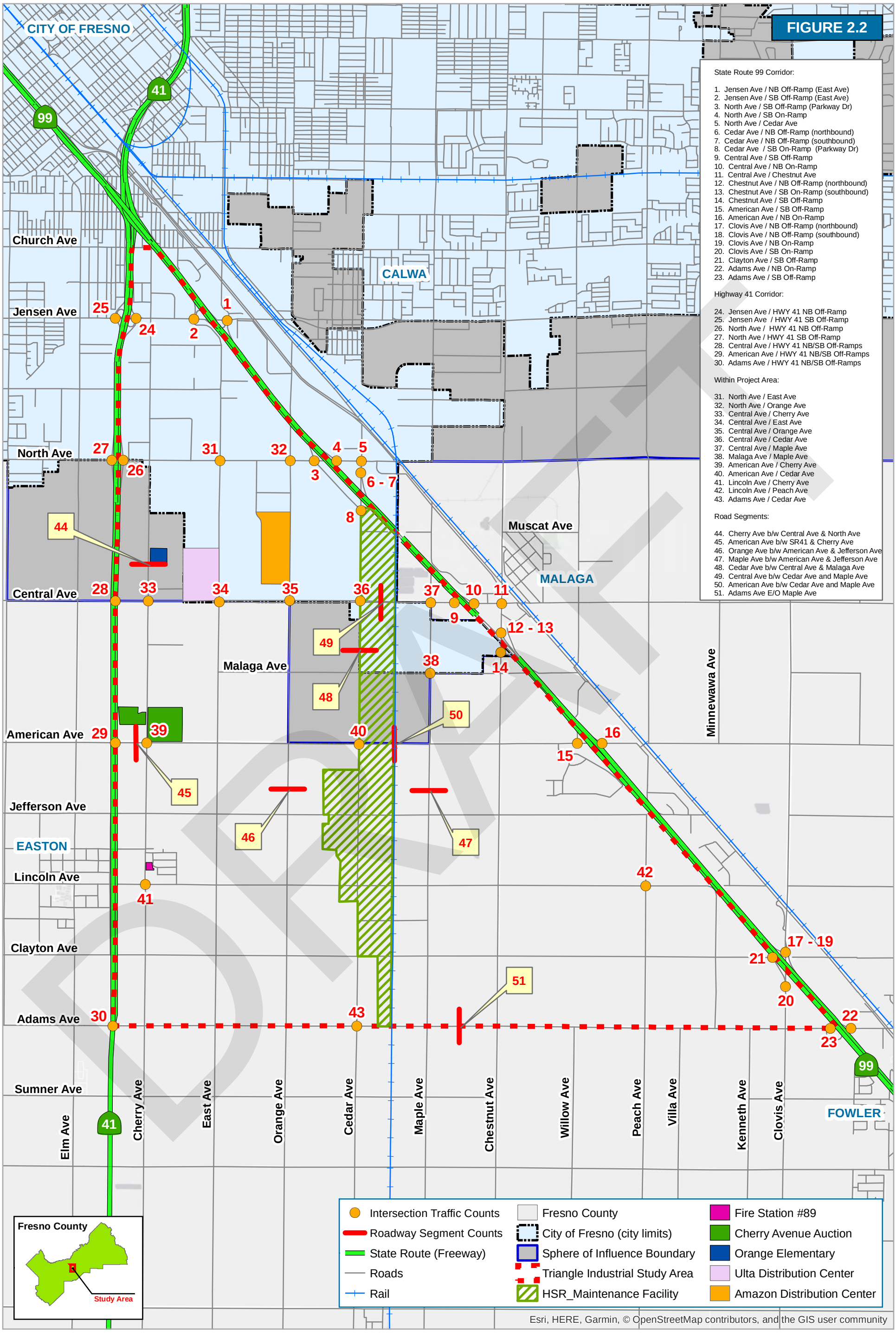
The following intersections and road segments were identified in coordination with the FCOG, City of Fresno, County of Fresno and Caltrans. The project area includes 42 intersections and 8 road segments as listed in Table 2.1. Figure 2.2 illustrates the study intersections and road segments for analysis.

Table 2.1 Study Intersections and Road Segments

Study Intersections and Road Segments	
State Route 99 Corridor	27. North Ave / HWY 41 SB Off-Ramp
1. Jensen Ave / NB Off-Ramp (East Ave)	**28. Central Ave / HWY 41 NB/SB Off-Ramps**
2. Jensen Ave / SB Off-Ramp (East Ave)	**29. American Ave / HWY 41 NB/SB Off-Ramps**
3. North Ave / SB Off-Ramp (Parkway Dr)	30. **Adams Ave / HWY 41 NB/SB Off-Ramps**
4. North Ave / SB On-Ramp	**Within Project Area**
5. North Ave / Cedar Ave	**31. North Ave / East Ave**
6. Cedar Ave / NB Off-Ramp (northbound)	**32. North Ave / Orange Ave**
7. Cedar Ave / NB Off-Ramp (southbound)	**33. Central Ave / Cherry Ave**
8. Cedar Ave / SB On-Ramp / Parkway Dr	**34. Central Ave / East Ave**
9. Central Ave / SB Off-Ramp	**35. Central Ave / Orange Ave**
10. Central Ave / NB On-Ramp	**36. Central Ave / Cedar Ave**
11. Central Ave / Chestnut Ave	37. Central Ave / Maple Ave
12. Chestnut Ave / NB Off-Ramp (northbound)	38. Malaga Ave / Maple Ave
13. Chestnut Ave / SB Off-Ramp (southbound)	39. American Ave / Cherry Ave
14. Chestnut Ave / SB On-Ramp	40. American Ave / Cedar Ave
15. American Ave / SB Off-Ramp	41. Lincoln Ave / Cherry Ave
16. American Ave / NB On-Ramp	42. Lincoln Ave / Peach Ave
17. Clovis Ave / NB Off-Ramp (northbound)	43. Adams Ave / Cedar Ave
18. Clovis Ave / NB Off-Ramp (southbound)	
19. Clovis Ave / NB On-Ramp	**Road Segments**
20. Clovis Ave / SB On-Ramp / Clayton Ave	44. Cherry Ave b/w Central Ave & North Ave
21. Clayton Ave / SB Off-Ramp	45. American Ave b/w SR41 & Cherry Ave
22. Adams Ave / NB On-Ramp	46. Orange Ave b/w American Ave & Jefferson Ave
23. Adams Ave / SB Off-Ramp	47. Maple Ave b/w American Ave & Jefferson Ave
State Route 41 Corridor	48. Cedar Ave b/w Central Ave & Malaga Ave
24. Jensen Ave / HWY 41 NB Off-Ramp	**49. Central Ave b/w Cedar Ave and Maple Ave**
25. Jensen Ave / HWY 41 SB Off-Ramp	**50. American Ave b/w Cedar Ave and Maple Ave**
26. North Ave / HWY 41 NB Off-Ramp	**51. Adams Ave E/O Maple Ave**

Notes: **Traffic volume Intersection counts provided by the City of Fresno**
Italicized Bold (road segments): Daily segment volume counts provided by the County of Fresno
Traffic volumes intersection counts provided by Caltrans
Traffic volumes intersection counts provided by Metro Traffic Data, Inc.

FIGURE 2.2



State Route 99 Corridor:

1. Jensen Ave / NB Off-Ramp (East Ave)
2. Jensen Ave / SB Off-Ramp (East Ave)
3. North Ave / SB Off-Ramp (Parkway Dr)
4. North Ave / SB On-Ramp
5. North Ave / Cedar Ave
6. Cedar Ave / NB Off-Ramp (northbound)
7. Cedar Ave / NB Off-Ramp (southbound)
8. Cedar Ave / SB On-Ramp (Parkway Dr)
9. Central Ave / SB Off-Ramp
10. Central Ave / NB On-Ramp
11. Central Ave / Chestnut Ave
12. Chestnut Ave / NB Off-Ramp (northbound)
13. Chestnut Ave / SB On-Ramp (southbound)
14. Chestnut Ave / SB Off-Ramp
15. American Ave / SB Off-Ramp
16. American Ave / NB On-Ramp
17. Clovis Ave / NB Off-Ramp (northbound)
18. Clovis Ave / NB Off-Ramp (southbound)
19. Clovis Ave / NB On-Ramp
20. Clovis Ave / SB On-Ramp
21. Clayton Ave / SB Off-Ramp
22. Adams Ave / NB On-Ramp
23. Adams Ave / SB Off-Ramp

Highway 41 Corridor:

24. Jensen Ave / HWY 41 NB Off-Ramp
25. Jensen Ave / HWY 41 SB Off-Ramp
26. North Ave / HWY 41 NB Off-Ramp
27. North Ave / HWY 41 SB Off-Ramp
28. Central Ave / HWY 41 NB/SB Off-Ramps
29. American Ave / HWY 41 NB/SB Off-Ramps
30. Adams Ave / HWY 41 NB/SB Off-Ramps

Within Project Area:

31. North Ave / East Ave
32. North Ave / Orange Ave
33. Central Ave / Cherry Ave
34. Central Ave / East Ave
35. Central Ave / Orange Ave
36. Central Ave / Cedar Ave
37. Central Ave / Maple Ave
38. Malaga Ave / Maple Ave
39. American Ave / Cherry Ave
40. American Ave / Cedar Ave
41. Lincoln Ave / Cherry Ave
42. Lincoln Ave / Peach Ave
43. Adams Ave / Cedar Ave

Road Segments:

44. Cherry Ave b/w Central Ave & North Ave
45. American Ave b/w SR41 & Cherry Ave
46. Orange Ave b/w American Ave & Jefferson Ave
47. Maple Ave b/w American Ave & Jefferson Ave
48. Cedar Ave b/w Central Ave & Malaga Ave
49. Central Ave b/w Cedar Ave and Maple Ave
50. American Ave b/w Cedar Ave and Maple Ave
51. Adams Ave E/O Maple Ave

N

0 0.25 0.5 0.75 1
Miles

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Study Intersections and Road Segments

Project No. 11192258
Date 6/12/2019

Fresno Council of Governments
GHD

L:\Prj\2618\G2618\Maps\Working\Study Intersections and Road Segments.mxd
Print date: 17 Jul 2019 - 08:20

Paper Size ANSI B (portrait)

Data source: GHD 2019, Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2

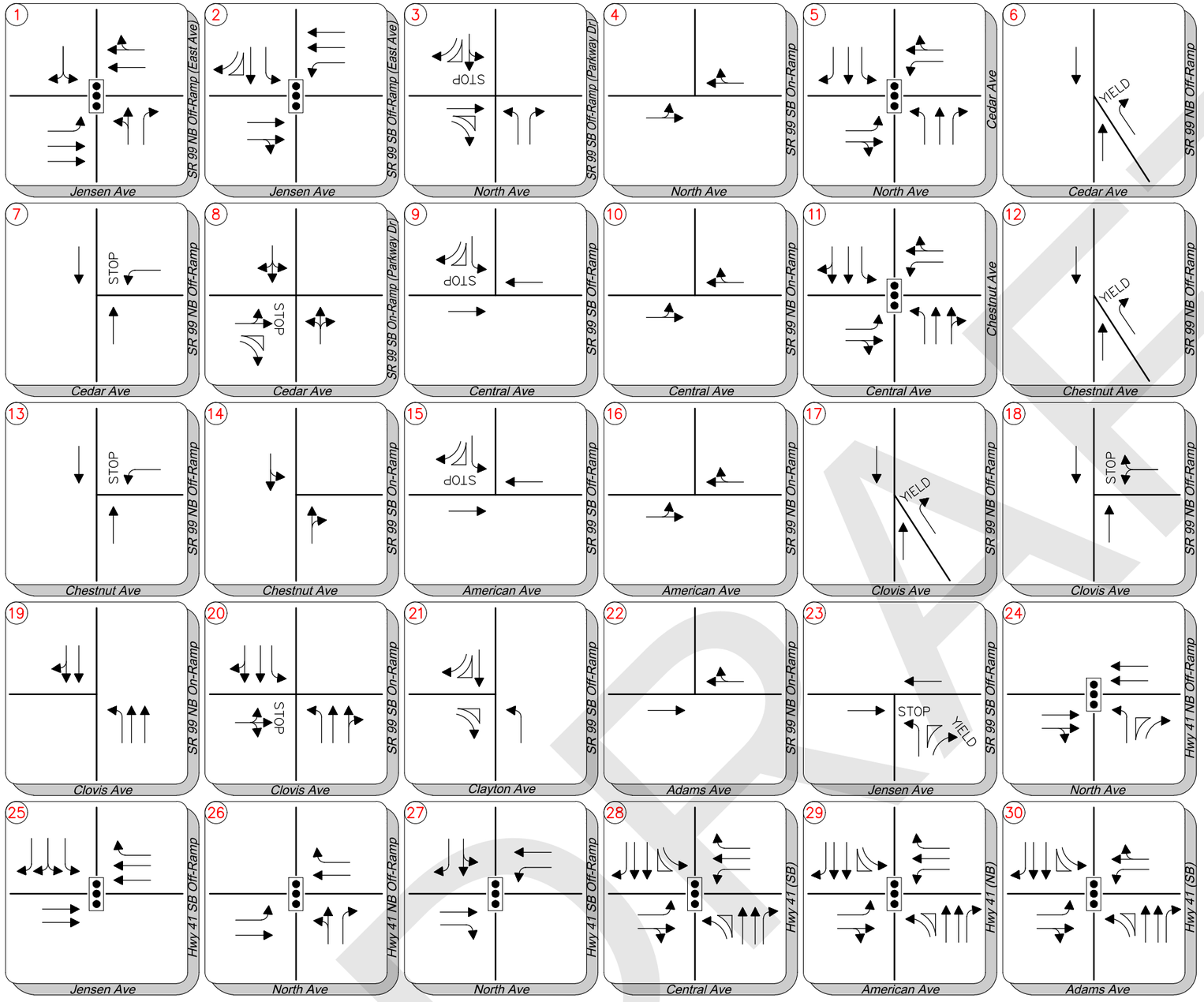
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

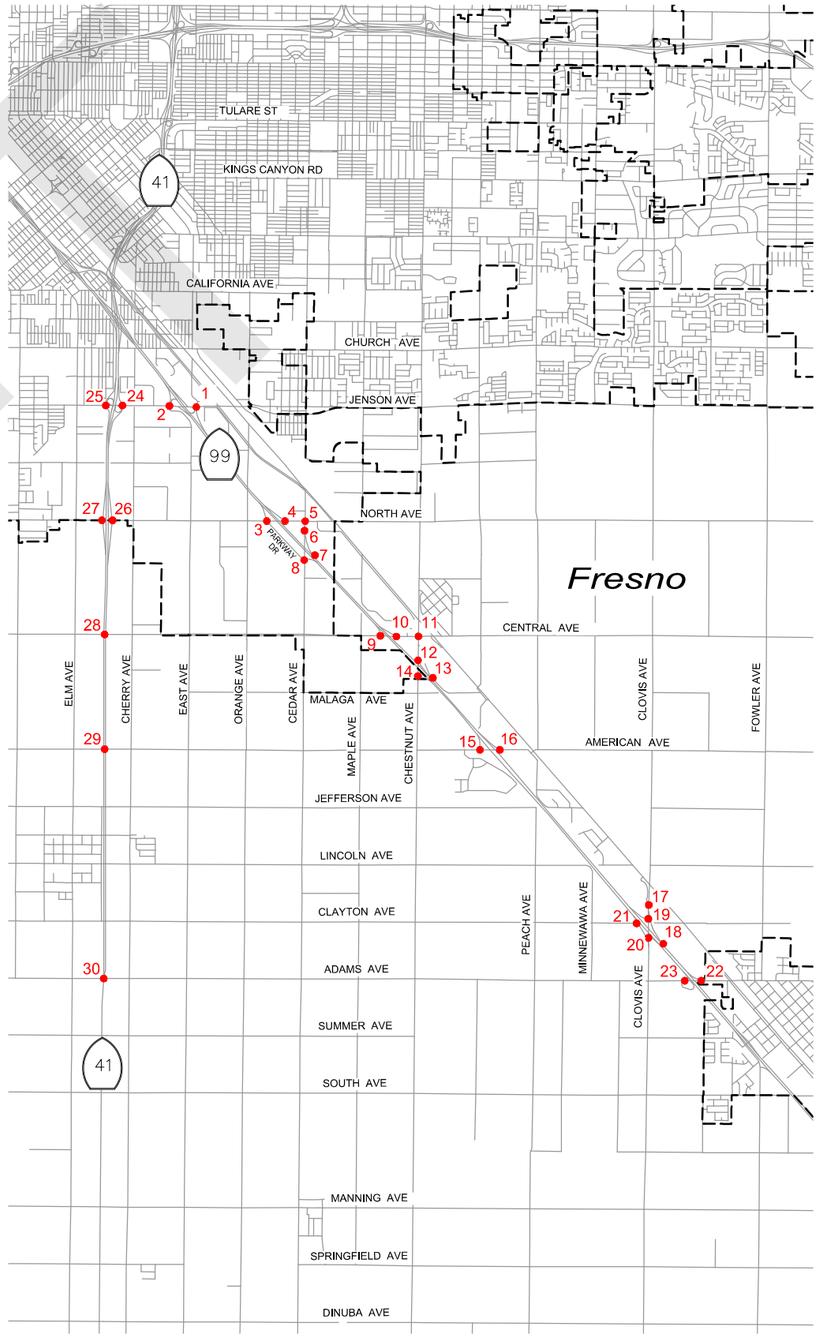
2.2 Data Collection and Analysis

As a collaborative approach GHD requested recent data collection traffic counts from City of Fresno, County of Fresno and Caltrans. Intersection and segment locations provided from the City of Fresno, County of Fresno and Caltrans are noted in the above table (Table 2.1)

The remaining of the intersections were collected by Metro Traffic Data Inc. on Thursday, May 23rd, 2019. No known special events were occurring in the area at the time of the traffic counts. Counts were obtained in the absence of inclement weather and during school session.

Figure 2.3A and 2.3B presents the existing intersection lane geometrics and traffic controls. Figure 2.4A and 2.4B presents the existing weekday AM and PM peak hour volumes.





REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

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REVERSE TRIANGLE TRANSPORTATION AREA PLAN

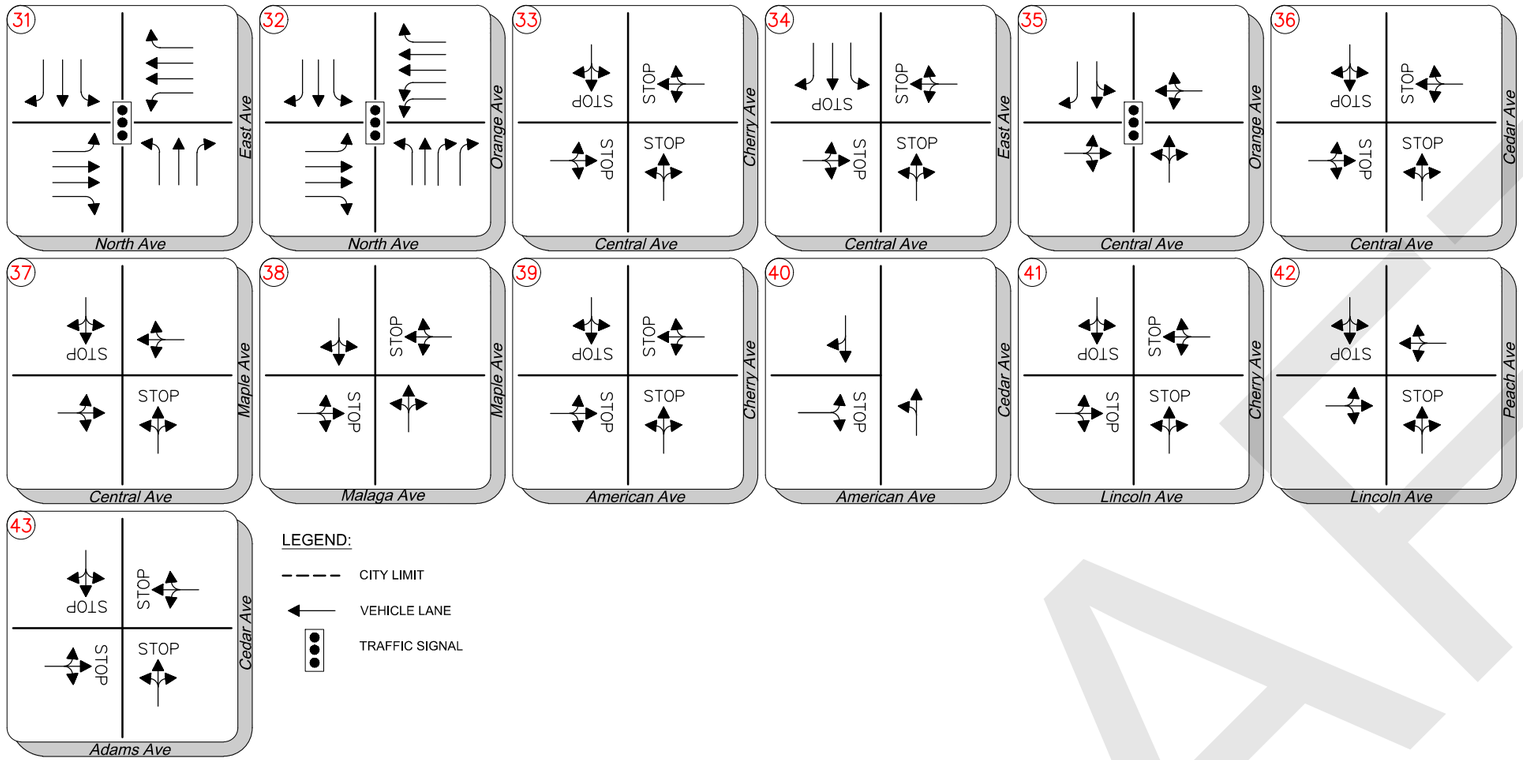
EXISTING LANE GEOMETRICS AND CONTROL

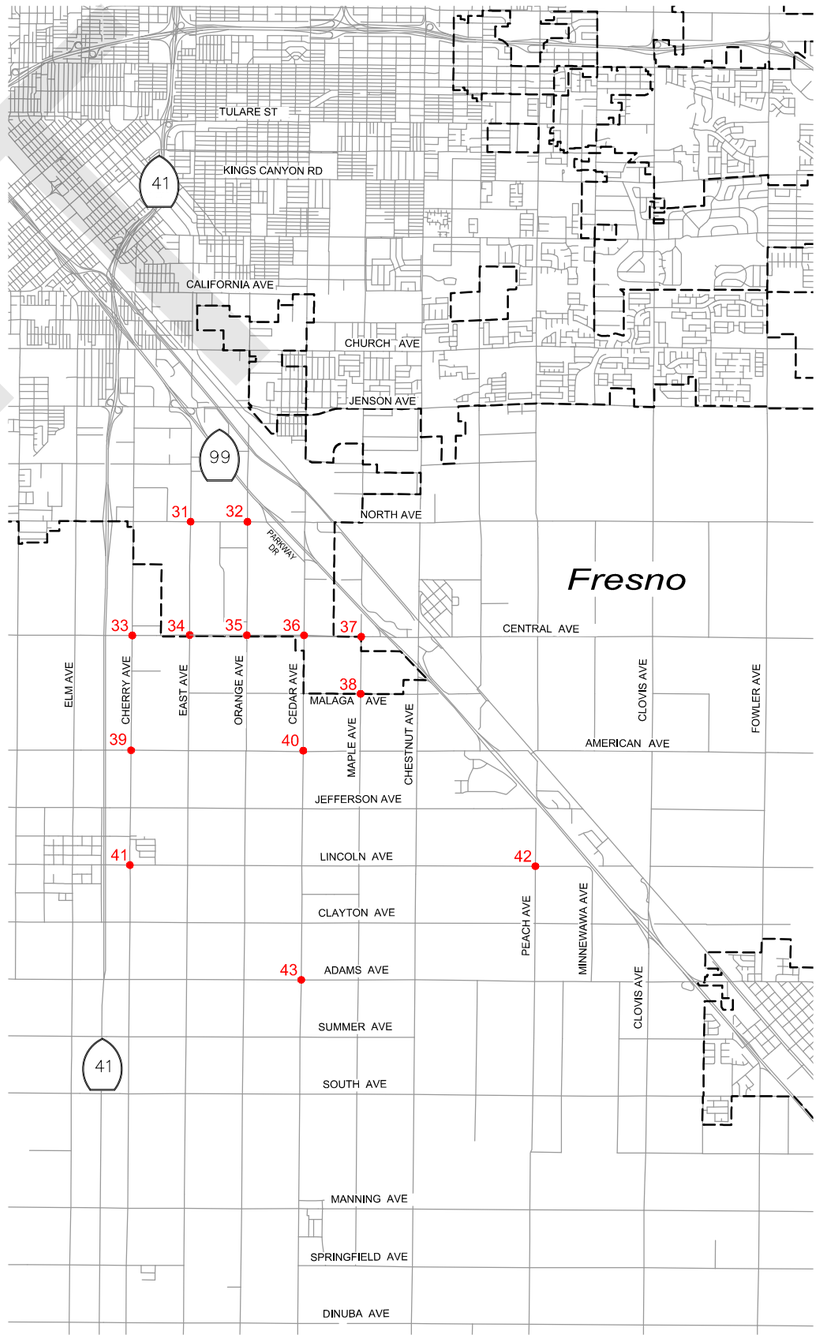
Project No. **11192258**
Report No. **001**
Date **07.10.2019**

FIGURE 2.3A

Filename: L:\Prj\2618\T2618\T2618TG001.dwg Plot Date: 17 July 2019 - 2:13 PM

Source:





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REVERSE TRIANGLE TRANSPORTATION AREA PLAN

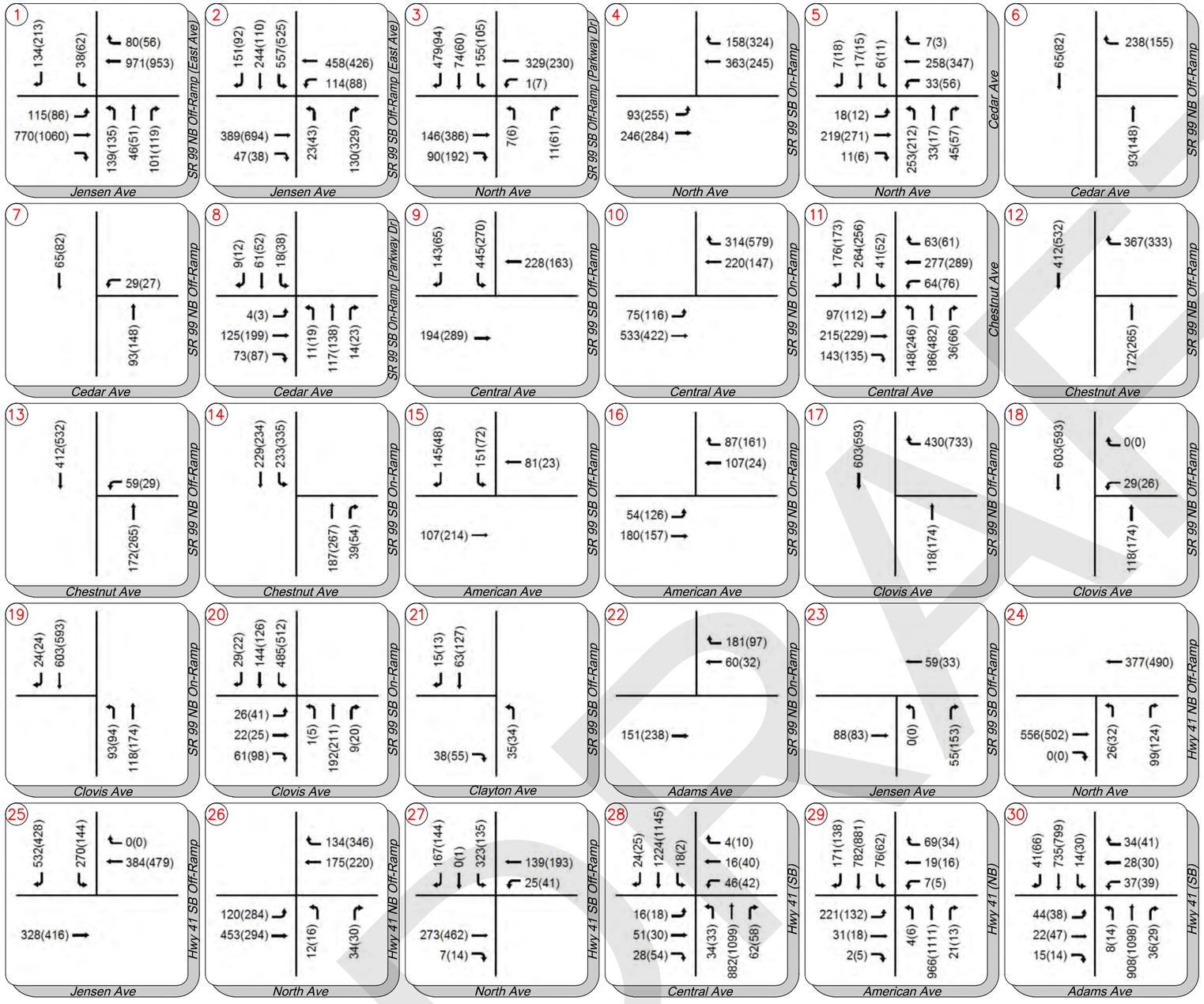
EXISTING LANE GEOMETRICS AND CONTROL

Project No. 11192258
Report No. 001
Date 07.10.2019

FIGURE 2.3B

Filename: L:\Prj\2618\T2618\T2618TG001.dwg Plot Date: 17 July 2019 - 2:14 PM

Source:



REVERSE TRIANGLE
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REVERSE TRIANGLE TRANSPORTATION AREA PLAN

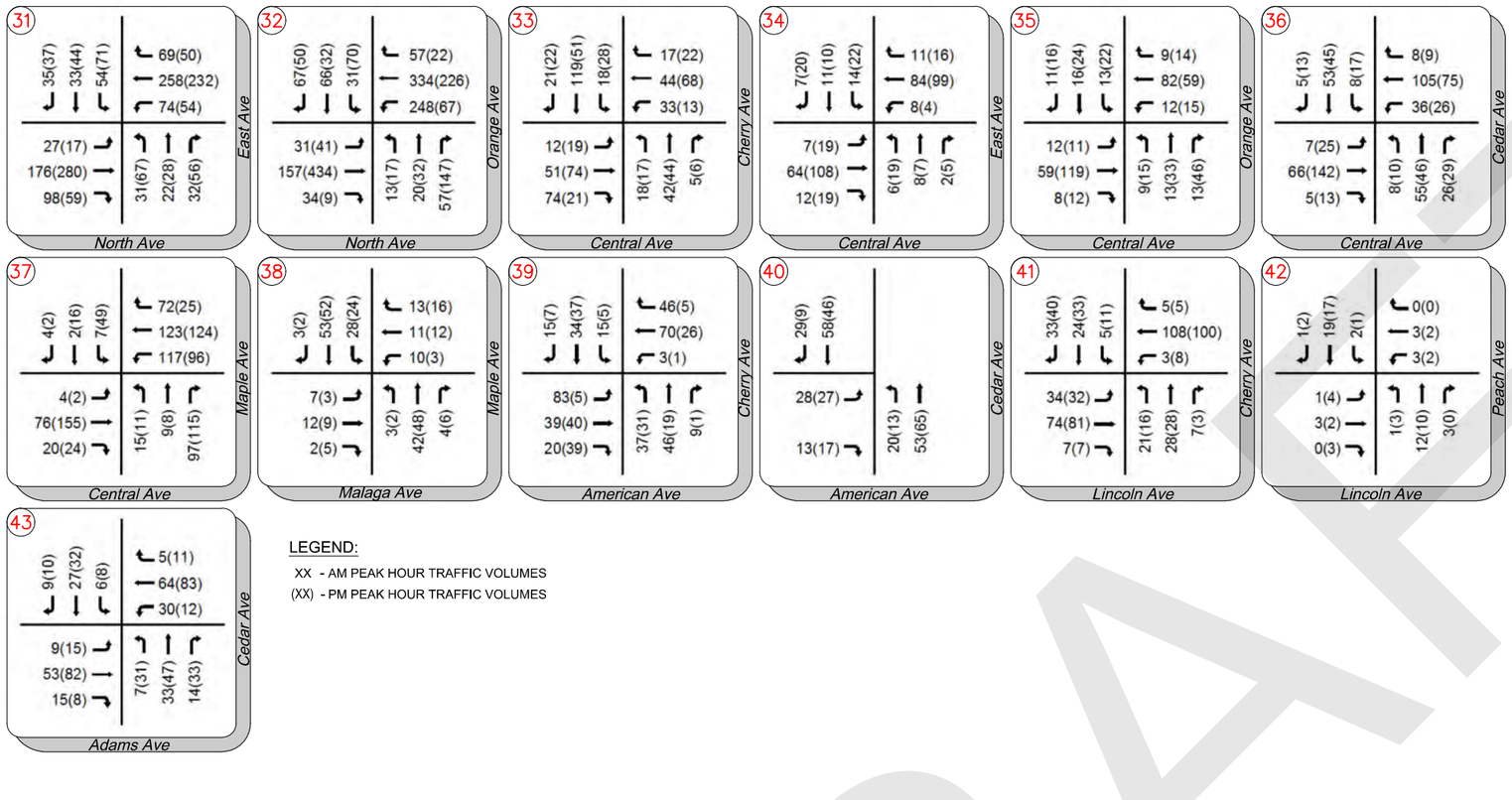
EXISTING PEAK HOUR TRAFFIC VOLUMES

Project No. **11192258**
Report No. **001**
Date **07.10.2019**

FIGURE 2.4A

Filename: L:\Prj\2618\T2618\T2618TG001.dwg Plot Date: 17 July 2019 - 2:15 PM

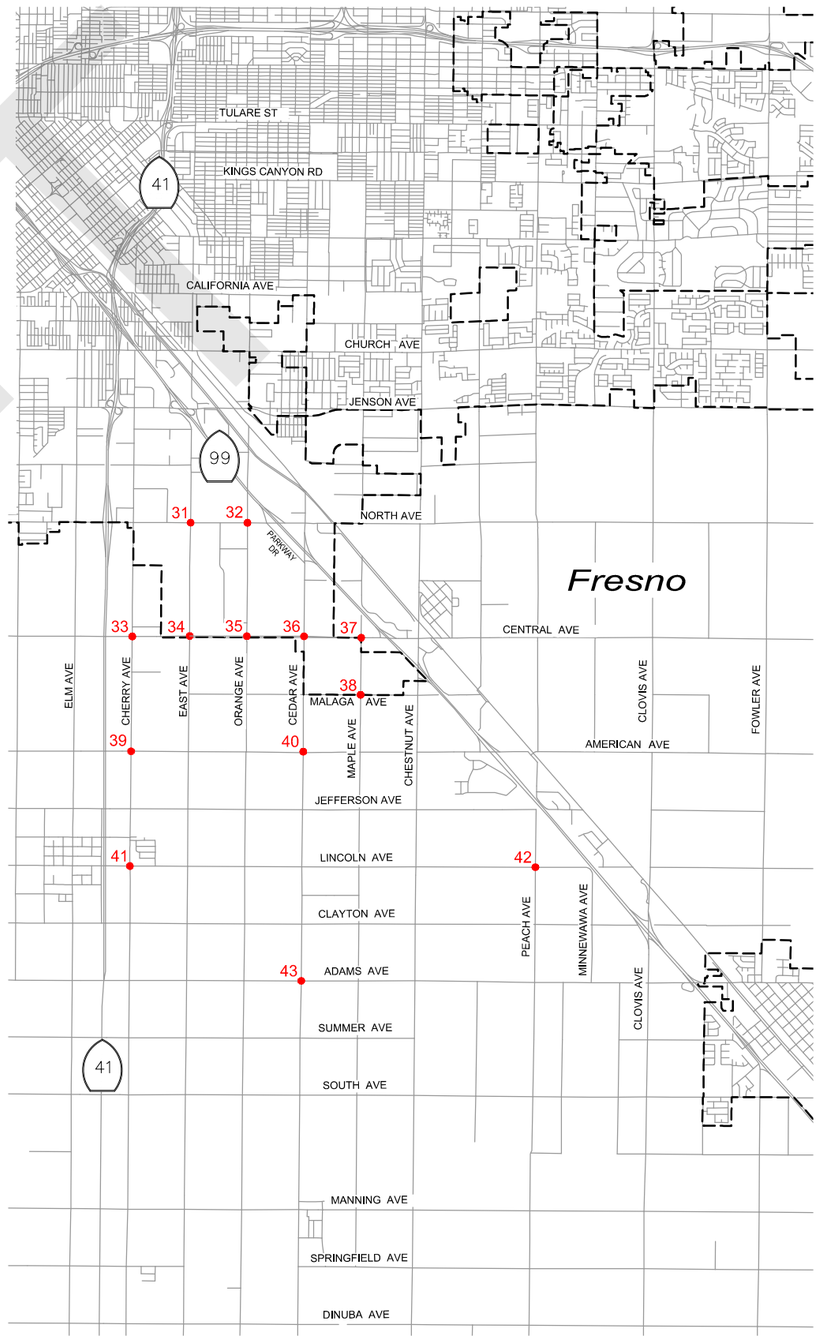
Source:



LEGEND:

XX - AM PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



REVERSE TRIANGLE TRANSPORTATION AREA PLAN

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REVERSE TRIANGLE TRANSPORTATION AREA PLAN

EXISTING PEAK HOUR TRAFFIC VOLUMES

Project No. 11192258
Report No. 001
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FIGURE 2.4B

Filename: L:\Prj\2618\T2618\T2618TG001.dwg Plot Date: 17 July 2019 - 2:15 PM

Source:

3. Level of Service Methodologies and Guidelines

The following section presents a summary of the general level of service (LOS) methodologies and guidelines used in the analysis of intersections.

3.1 General LOS Methodologies

Intersection level of service (LOS) was calculated for all control types (e.g. signalization, stop sign controlled) using the Synchro 10.0 (Trafficware) integrated computer software program. LOS determinations are presented on a letter grade scale from "A" to "F", whereby LOS "A" represents "free-flow" conditions and LOS "F" represents over capacity conditions.

3.1.1 Intersection LOS Methodologies

For signalized intersections, intersection delays and LOS are average values for all intersection movements. Table 3.1 presents the delay-based LOS criteria for different types of intersection control.

3.2 Agency LOS Guidelines and Policies

3.2.1 City of Fresno LOS Guidelines[1]

The following City of Fresno guidelines is direct language taken from the City of Fresno Traffic Impact Study Report Guidelines (October 18, 2006 – updated February 2, 2009).

All City intersections and roadway segments shall operate at a LOS D or better under the near-term conditions, unless a finding of overriding consideration was adopted in the Master General Plan EIR. Under long-term conditions (Year 2025 Conditions) all City intersections and roadway segments shall operate at a LOS D or better, except for the roadway segments adopted in the Master Genera l Plan EIR to operate at LOS E or F. The LOS shall be based on average delay for signalized and unsignalized intersections and Florida Tables (Tables 3.2 below) for roadway segments. The traffic analysis methodologies for the facility types indicated below will be accepted without prior consultation.

- *Signalized Intersections 1 - Highway Capacity Manual* using Highway Capacity Software (HCS), TRAFFIX, Synchro, or other software approved by the City Traffic Engineer*
- *Un-signalized Intersections - Highway Capacity Manual" 'using HCS, TRAFFIX. Sim-Traffic, or other software approved by the City Traffic Engineer*
- *Signal Warrants - MUTCD Signal Warrants**
- *Roadway Segments - HCM*, Florida Tables*

[1] City of Fresno Traffic Impact Study Report Guidelines, October 18, 2006 (Updated on February 2, 2009)

Table 3.1 – Level of Service (LOS) Criteria for Intersections

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle		
				Signalized	Un-signalized	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	<10.0	<10.0	<10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and <20.0	>10.0 and <15.0	>10.0 and <15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and <35.0	>15.0 and <25.0	>15.0 and <25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and <55.0	>25.0 and <35.0	>25.0 and <35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and <80.0	>35.0 and <50.0	>35.0 and <50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0	>50.0

References: Highway Capacity Manual 6th Edition

While the City of Fresno does not officially advocate the use of any software, Synchro is the software used by City staff. The LOS analysis at study intersections shall be conducted using the following default values as applicable:

- *Use of signal timing plans, if available. If not available, then:*
    - *Minimum split time for protected left-turn phase shall not be less than 12 seconds if volumes warrant the need.*
    - *Minimum pedestrian times should be satisfied on all phases with pedestrian phase for signals modeled as coordinated signals.*
    - *For study intersections modeled as actuated uncoordinated signals, the intersections shall be evaluated with at-least 10 pedestrian calls per hour in the Existing + Project and 2025 Conditions, if pedestrian projections are not available.*
    - *If existing cycle lengths are available they should be utilized. In instances were existing cycle lengths are not available, LOS calculations should be conducted using the natural cycle lengths. The cycle lengths should remain constant for comparison purposes unless the project is changing the character of the intersection and it is noted in the report.*
    - *In instances where signalized intersections are coordinated, coordinated cycle lengths should be determined based on the natural cycle lengths of the coordinated signals and shall be used for evaluation purposes.*
    - *Minimum All-Red time(s) shall equal 1.0 seconds.*
    - *Minimum Yellow time shall equal 3.5 seconds, or greater based upon the approach speeds.*

3.2.1.1 Significant Impact Threshold (City)

For study intersections, the impact is considered significant if the addition of the traffic generated from the proposed project results in any one of the following:

- *Triggers an intersection operating at acceptable LOS to operate at unacceptable levels of service*
- *Triggers an intersection operating at unacceptable LOS (LOS E) to operate at LOS F.*
- *Increases the average delay for a study intersection that is already operating at unacceptable LOS.*

Table 3.3 – Volume Thresholds for Roadway Levels of Service - Urban

Uninterruped Flow Highways						
Lanes	**Median**	**A**	**B**	**C**	**D**	**E**
2	Undivided	*	8,600	17,000	24,200	33,300
2	Divided	*	36,700	51,800	65,600	72,600
6	Divided	*	55,500	77,700	98,300	108,800
Uninterupted Flow Highway Adjustments						
Lanes	**Median**	**Exclusive left lanes**			**Adjustment factors**	
2	Divided	Yes			+5%	
Multi	Undivided	Yes			-5%	
Multi	Undivided	No			-25%	

Reference: Florida Department of Transportation Table 1, Generalized Annual Average Daily Volumes for Florida's Urbanized Areas.
*Note: * = Cannot be achieved using table input value defaults*

3.2.2 County of Fresno LOS Guidelines[2]

The following County of Fresno guidelines is direct language taken from the County of Fresno Guidelines Traffic Impact Study (Draft May 2018).

The Fresno County Circulation System is a street and highway plan designed to provide for the safe and efficient movement of people and goods to and within the county and to ensure safe and continuous access to land.

Policy TR-A.2 - The County shall plan and design its roadway system in a manner that strives to meet Level of Service (LOS) D on urban roadways within the spheres of influence of the cities of Fresno and Clovis and LOS C on all other roadways in the county.

In no case should the County plan for worse than LOS D on rural County roadways, worse than LOS E on urban roadways within the spheres of influence of the cities of Fresno and Clovis, or in cooperation with Caltrans and the Council of Fresno County Governments, plan for worse than LOS E on State highways in the county.

3.2.2.1 Significant Impact Threshold (County)

A project is considered to have a significant impact if its traffic, when added to the traffic of the without-project condition, would cause any of the changes in traffic conditions described below.

1. ***On roadway segments:***

[2] Fresno County Guidelines for the Preparation of Traffic Impact Studies (Draft May 2018)

a) *Cause a roadway that is operating at an acceptable LOS to deteriorate to an unacceptable LOS; OR*

b) *Cause the V/C ratio (on a directional peak hour basis) to increase by more than 0.05 on a roadway that is already operating at an unacceptable LOS. It should be noted that a decrease from an unacceptable LOS to a lesser LOS (e.g. from LOS D to LOS E in County areas) is not considered an impact unless the corresponding V/C ratio increase is greater than 0.05.*

2. At signalized intersections:

a) *Cause an intersection that is operating at an acceptable LOS to deteriorate to an unacceptable LOS; OR*

b) *Cause the average delay to increase by more than 5.0 seconds at a signalized intersection that is operating at an unacceptable LOS. It should be noted that a decrease from an unacceptable LOS to a lesser LOS (e.g. from LOS D to LOS E in County areas) is not considered an impact unless the corresponding delay increase is greater than 5.0 seconds.*

3. At unsignalized intersections, including all-way stop, minor approach stop, and roundabouts

a) *Cause a movement or approach that is operating at an acceptable LOS to deteriorate to an unacceptable LOS; OR*

b) *Cause the average delay to increase by more than 5.0 seconds on a movement or approach that is operating at an unacceptable LOS. It should be noted that a decrease from an unacceptable LOS to a lesser LOS (e.g. from LOS D to LOS E in County areas) is not considered an impact unless the corresponding delay increase is greater than 5.0 seconds.*

4. On roadways with a paved width of less than 18 feet (essentially one-lane roadways)

a) *Cause a roadway that already carries 100 vehicles per day (vpd) or less to carry more than 100 vpd; OR*

b) *Cause a roadway that already carries more than 100 vpd to carry any additional traffic.*

5. On roadways that require analysis based on the traffic volume criteria described above, cause an increase in the traffic index of 0.5 or more, EXCEPT on roadways that have been resurfaced within the last five years and for which the design traffic index at the time of the resurfacing exceeded the calculated traffic index with the project. If the design traffic index is not available then the exception shall not apply.

3.2.3 California Department of Transportation (Caltrans) Guidelines[3]

The following County of Fresno guidelines is direct language taken from the California Department of Transportation Guide for the Preparation of Traffic Impact Study (December 2002).

Caltrans level of service (LOS) for operating State highway facilities is based upon measures of effectiveness (MOEs) which are described in Appendix "C-2" in the TIS. Additionally, as noted in Appendix "C-3" of the TIS, Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained.

3.2.3.1 Measures of Effectiveness by Facility Type

Measures of effectiveness for level of service definitions located in the most recent version of the Highway Capacity Manual, Transportation Research Board, National Research Council. Table 3.4 illustrated the type of facility and its measure of effectiveness as described in the TIS. Additionally, Table 3.5 shows the transition between LOS "C" and LOS "D" criteria for signalized intersections and terminals.

Table 3.4 – Measures of Effectiveness by Facility Type

Type of Facility	Measure of Effectiveness (MOE)
Basic Freeway Segments	Density (pc/mi/ln)
Ramps	Density (pc/mi/ln)
Ramp Terminals	Delay (sec/veh)
Multi-Lane Highways	Density (pc/mi/ln)
Two-Lane Highways	Percent-Time-Following Average Travel Speed (mi/hr)
Signalized Intersections	Control Delay per Vehicle (sec/veh)
Unsignalized Intersections	Average Control Delay per Vehicle (sec/veh)
Urban Streets	Average Travel Speed (mi/hr)

Table 3.5 – Signalized Intersections and Ramp Terminals

LOS	Control Delay per Vehicle (sec/veh)
A	≤ 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

[3] California Department of Transportation Guide for the Preparation of Traffic Impact Studies (TIS), December 2002

3.3 Intersection Operation Analysis Software

The Synchro 10 (Trafficware) software suite was used to implement the LOS analysis for signalized/unsignalized intersections analyzed within this study.

3.4 Significance Thresholds

The following thresholds of significance are used to determine if the proposed Project causes a significant impact and requires mitigation:

3.4.1 Signalized Intersections

- The Project causes the intersection's acceptable LOS to decline to an unacceptable LOS

3.5 Technical Analysis Parameters

This TIA provides evaluation of traffic operating conditions by incorporating appropriate heavy vehicle adjustment factors, peak hour factors, and signal timings and reports the resulting intersection delays and LOS as estimated using Synchro 10.0. The following section describes all technical parameters incorporated into intersection analysis.

Table 3.6 presents technical parameters which were applied to study intersections during the analysis.

Table 3.6 – Intersection LOS: Technical Analysis Parameters

Technical Parameters	Assumption
% Trucks	Intersection Overall Approach, based on Existing Counts, min 2%
PHF for Existing & Short Term	Intersection Overall Approach, based on Existing Counts
PHF for Future Conditions	Intersection Overall, 0.92 or higher
Signal Timings	Based on Agency timing plans (City of Fresno and Caltrans)
Grade	2% or less at all intersections

4. Existing Conditions

The *Existing* conditions is the analysis scenario in which current operations at study locations are analyzed and establishes the baseline traffic conditions.

4.1 Intersection Operations

Existing weekday AM and PM peak hour intersection traffic operations were quantified utilizing the existing traffic volumes, signal timings, and intersection lane geometrics and control. Table 4.1 presents intersection operations for the *Existing* conditions.

Table 4.1 – Existing Peak Hour Conditions Intersection Operations

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	Jensen Avenue / SR-99 NB Off-Ramp (East Avenue)	Signal	D	18.7	B	–	16.0	B	–
2	Jensen Avenue / SR-99 SB Off-Ramp (East Avenue)	Signal	D	48.7	D	–	36.7	D	–
3	**North Avenue / SR-99 SB Off-Ramp (Parkway Dr)**	**TWSC**	**D**	**90.2**	**F**	**Yes**	**86.4**	**F**	**No**
4	North Avenue / SR-99 SB On-Ramp	None	D	N/A					
5	North Avenue / Cedar Avenue	Signal	D	21.1	C	–	19.5	B	–
6	Cedar Avenue / SR-99 NB Off-Ramp (northbound)	None	D	N/A		–			–
7	Cedar Avenue / SR-99 NB Off-Ramp (southbound)	TWSC	D	9.7	A	No	10.9	B	No
8	Cedar Avenue / SR-99 SB On-Ramp (Parkway Dr)	TWSC	D	10.9	B	No	10.8	B	No
9	**Central Avenue / SR-99 SB Off-Ramp**	**TWSC**	**D**	**73.8**	**F**	**No**	18.8	C	No
10	Central Avenue / SR-99 NB On-Ramp	None	D	N/A					
11	Central Avenue / Chestnut Avenue	Signal	D	29.6	C	–	32.6	C	–
12	Chestnut Avenue / SR-99 NB Off-Ramp (northbound)	None	D	N/A					
13	Chestnut Avenue / SR-99 NB Off-Ramp (southbound)	TWSC	D	15.6	C	No	17.9	C	No
14	Chestnut Avenue / SR-99 SB On-Ramp	None	D	N/A					
15	American Avenue / SR-99 SB Off-Ramp	TWSC	D	12.0	B	No	11.9	B	No
16	American Avenue / SR-99 NB On-Ramp	None	D	N/A					

Table 4.1 – Existing Peak Hour Conditions Intersection Operations

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
17	Clovis Avenue / SR-99 NB Off-Ramp (northbound)	None	D	N/A					
18	Clovis Avenue / SR-99 NB Off-Ramp (southbound)	TWSC	D	12.4	B	No	12.5	B	No
19	Clovis Avenue / SR-99 NB On-Ramp	None	D	N/A					
20	**Clovis Avenue / SR-99 SB On-Ramps**	**TWSC**	**D**	32.0	D	No	**75.6**	**F**	**No**
21	Clayton Avenue / SR-99 SB Off-Ramp	TWSC	D	9.1	A	No	9.5	A	No
22	Adams Avenue / SR-99 NB On-Ramp	None	D	N/A					
23	Adams Avenue / SR-99 SB Off-Ramp	TWSC	D	9.0	A	No	9.8	A	No
24	Jensen Avenue / HWY-41 NB Off-Ramp	Signal	D	5.9	A	–	8.8	A	–
25	Jensen Avenue / HWY-41 SB Off-Ramp	Signal	D	20.2	A	–	9.9	A	–
26	North Avenue / HWY-41 NB Off-Ramp	Signal	D	7.2	A	–	10.6	B	–
27	North Avenue / HWY-41 SB Off-Ramp	Signal	D	50.5	D	–	10.8	B	–
28	Central Avenue / HWY-41 NB/SB Off-Ramps	Signal	D	29.3	C	–	24.7	C	–
29	American Avenue / HWY-41 NB/SB Off-Ramps	Signal	D	35.6	D	–	25.0	C	–
30	Adams Avenue / HWY-41 NB/SB Off-Ramps	Signal	D	20.2	C	–	22.3	C	–
31	North Avenue / East Avenue	Signal	D	19.0	B	–	19.1	B	–
32	North Avenue / Orange Avenue	Signal	D	16.8	B	–	19.0	B	–
33	Central Avenue / Cherry Avenue	AWSC	D	8.8	A	No	8.2	A	No
34	Central Avenue / East Avenue	AWSC	D	8.6	A	No	9.9	A	No
35	Central Avenue / Orange Avenue	Signal	D	9.4	A	–	10.1	B	–
36	Central Avenue / Cedar Avenue	AWSC	D	9.0	A	No	10.6	B	No
37	Central Avenue / Maple Avenue	TWSC	D	14.7	B	No	23.7	C	No
38	Malaga Avenue / Maple Avenue	TWSC	D	10.5	B	No	10.1	B	No
39	American Avenue / Cherry Avenue	AWSC	D	8.4	A	No	7.5	A	No

Table 4.1 – Existing Peak Hour Conditions Intersection Operations

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
40	American Avenue / Cedar Avenue	TWSC	D	10.0	A	No	9.5	A	No
41	Lincoln Avenue / Cherry Avenue	AWSC	D	8.5	A	No	8.4	A	No
42	Lincoln Avenue / Peach Avenue	TWSC	D	9.2	A	No	9.3	A	No
43	Adams Avenue / Cedar Avenue	AWSC	D	8.1	A	No	8.4	A	No

Notes:
NB=Northbound, SB=Southbound, SR=State Route, HWY=Highway (State Route), N/A=Not Applicable
1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor approach for TWSC intersections; average of all approaches for AWSC, signal
3. Warrant = Based on California MUTCD Warrant 3
4. None = No stop control type, movement is free-flow, therefore no delay was registered. Intersections movement consists of on/off ramp thru movements.

As presented in Table 4.1, all study intersections for Existing conditions are currently found to operate at or above the threshold LOS D, except for the following intersections during the AM and/or PM peak hours:

- #3 - North Avenue / SR-99 SB Off-Ramp (Parkway Dr)
- #9 - Central Avenue / SR-99 SB Off-Ramp
- #20 - Clovis Avenue / SR-99 SB On-Ramps

4.2 Daily Segment Operations

Existing roadway segments were quantified using existing AADT values collected on Wednesday, May 8, 2019. Table 4.2 contains a summary of the roadway segments LOS results under Existing Conditions.

Table 4.2 Roadway Segments Level of Service

#	Roadway Segment	Limits	No. of Lanes	Facility Type	AADT	LOS
44	Cherry Avenue	Central Avenue & North Avenue	2	Collector	1,720	B
45	American Avenue	Highway 41 & Cherry Avenue	2	Arterial	2,580[1]	B
46	Orange Avenue	American Avenue & Jefferson Avenue	2	Local	510	B
47	Maple Avenue	American Avenue & Jefferson Avenue	2	Local	830	B
48	Cedar Avenue	Central Avenue & Malaga Avenue	2	Arterial	1,620	B
49	Central Avenue	Cedar Avenue & Maple Avenue	2	Arterial	3,490	B
50	American Avenue	Cedar Avenue & Maple Avenue	2	Arterial	2,330	B
51	Adams Avenue	East of Maple Avenue	2	Collector	2,250	B

1. Seven-day average total

As shown in Table 4, all of the study roadway segments are currently operating at acceptable conditions under Existing conditions.

5. Conclusions

In general, existing traffic operating conditions indicate the study intersections generally meet or exceed current LOS thresholds. At a few ramp locations along the southbound State Route 99 corridor between Clovis and North Avenues experience unacceptable operations under Existing conditions. Mitigation measures for these locations will be identified in the upcoming TIAR. Currently, Caltrans is working on several studies within the study area that will identify recommended improvements.

Appendices

Appendix A: Traffic Peak Hour Volume Counts

- Metro Traffic Data, Inc.
- City of Fresno
- Caltrans

Appendix B Roadway Segment Daily Counts

- Metro Traffic Data, Inc.
- County of Fresno

Appendix C: Signal Timing Plans

- Caltrans
- City of Fresno

Economic Setting

Summary of Findings

Overall Finding

Located at the southern edge of the City, the 14.6-square-mile Project Area includes portions of the City and unincorporated County. The Project Area's boundaries-- State Highway 41, State Highway 99, and Adams Avenue—are major transportation corridors that have helped the area become a node for industrial distribution uses. [insert additional narrative about scattered residential uses and limited infrastructure capacity on south side of Project Area.]

Individual Findings

Finding 1: There are nearly 300 businesses within the Project Area, including a large number of Manufacturing, Construction, Wholesale, and Transportation/Warehousing enterprises. Instead of being concentrated in a particular sector, businesses in most of these industries appear to be spread across multiple sectors. For example, Manufacturing companies produce metal, trucking, packaging, and printing products. There is a similar level of variation for Construction and Wholesale businesses. Within the Transportation/Warehousing industry, however, there is a large concentration of long-distance trucking freight businesses; given the superior transportation access provided by the Reverse Triangle to many other areas of the state, these businesses may benefit from serving clients inside and outside the Project Area.

Finding 2: More than 40 percent of the Project Area's 11,000 jobs are concentrated in the Manufacturing industry, with Retail Trade providing another 28 percent of local jobs. Top employers include Taylor Communications (a printing company), Amazon, Ulta, and Mission Foods; these four companies alone account for more than half of Project Area jobs. [Isabel to insert anecdotal findings from interviews]

Finding 3: The Project Area has approximately 10.3 million sq. ft. of industrial space, which accounts for about 16 percent of the City's industrial inventory. Industrial space has been constructed over time and includes Class A, Class B, and Class C product. More than half of existing inventory is contained within about 150 Class C buildings constructed as far back as the 1960's and as recently as the early 2000's; about half of this space is characterized as warehouse, while nearly 30 percent is characterized as Service and more than 10 percent as Distribution space. Class B space accounts for almost 20 percent of Project Area industrial inventory; this space is spread across about 45 buildings constructed mostly in the early 1990's, mid-2000's, and between 2013 and 2018. There are only 8 Class A buildings in the Project Area—these spaces are classified as Distribution (50 percent) or Warehouse (50 percent) and were built in 2008 or 2018.

Finding 4: In recent years, the Project Area has experienced significant growth and improvement in the industrial sub-market. Since 2010, the Project Area has experienced industrial inventory growth of about 35 percent, rental rate increases of about 10 percent, and strong occupancy rates in the range of 90-92 percent. During 2018, the Project Area experienced several

prominent industrial leases and sales, including 30 lease agreements and four property sales. [Isabel to insert anecdotal findings from interviews]

Finding 5: While the Project Area remains an ideal location for industrial development, additional new industrial development appears to be on hold in the near-term and the Project Area may experience increased competition from other sub-markets. At this time, there are no proposed development projects in the County portion of the Project Area. According to interviews with local stakeholders, additional infrastructure investment, particularly at Highway 99 and the railroad tracks crossing North Avenue east of the Project Area, would be needed to accommodate the next wave of industrial development. In the meantime, new development may be more attracted to areas that have large, shovel-ready industrial tracts ready that can more easily accommodate new industrial development, such as Visalia. *Pending data from City.*

Finding 6: The Project Area also has a small residential community with approximately 3,600 people and 1,200 residential units. This community is slightly older, more diverse, and earns lower incomes than the City as a whole, although residents there are more likely to be employed compared to the City overall. The Project Area has a greater share of persons 45-74 years old, a concentration of minority residents, and a larger proportion of people of Hispanic origin compared to Fresno as a whole. The average household income ($65,000) is also about $5,000 lower than the City average. More than one-third of employed residents work in Agriculture/Mining, which is a much larger concentration than Fresno as a whole (6 percent).

Finding 7: The lack of traditional retail and office development in the Project Area is consistent with the relatively small number of residents. Local population drives demand for local-serving brick-and-mortar retail and office space. The Project Area is located between two rural communities: Malaga (with a population of about 1,000) and Easton (with a population of about 2,000). Combined, these communities have a small amount of local-serving retail, such as convenience stores, small grocery stores/markets, and bank services. For community and regional retail goods and services, existing centers in Fresno, Fowler, and Selma can be accessed within a 15-20 minute drive. [Isabel working to expand this evaluation to include local-serving retail.]

Interview Take Away's

Interviews Conducted To Date

- Terry Hirschfield, Orange Center School District, August 2019
- Lupe Perez and Kelly Trevino, City of Fresno, July 19, 2019
- Jim Anderson, Malaga County Water District, July 8, 2019
- Ethan Smith, SIOR, CCIM, June 24, 2019
- Leland Parnagian, Fowler Packing, June 21, 2019
- Eric Wickland, Ulta, June 17, 2019
- *1-2 additional interviews requested through Manufacturer's Alliance*

Key Observations from Interviewees

- Project Area is strong location for distribution because of transportation access *and* available workforce.
- Regional competitor cities for distribution include Salt Lake City, Visalia, Fresno, Reno. Fresno is a less expensive place to set up shop for businesses that have to be in California. Locally, competitor cities include Selma, Hanford, Visalia, Fowler, Madera, as well as some other parts of Fresno (SW Fresno or near airport).
- That being said, industrial development opportunities are increasingly limited between Central and North. As a result, Visalia's competitive position is growing.
- Southern portion of Project Area could be attractive for more industrial development IF utilities can be provided. No sewer or water south of Central and west of Maple.
- Major Transportation Nodes causing concern include:
  - interchange at North Avenue (would like to accelerate this project)
  - otherwise, North Ave and Central Ave handle traffic well.
  - North Avenue users get a bit squeezed. Is ultimately buildout only one lane each direction? Is this a collector?
  - Just east of the triangle area, the North Avenue crossing at the railroad is a huge choke point in need of a solution.
  - Pinch points are Central Avenue, next stop is American. Infrastructure at interchanges is very important, increasing capacity at interchange. East, Orange, Cedar, and Cherry connections at Central and American are really important.
  - High priority area would include to Cherry Market and into that neighborhood.
  - Getting to 99 is really important. Prioritize on/off of 99. Then prioritize surface streets with most opportunity for future industrial development; some streets are too chopped up already.
- Orange Center Elementary School has 350 students, including pre school. K-8 school with pre school.
  - Majority of students ride the bus. District provides busing. Students driven in if they have inter-district transfers.
  - Very limited number of students walk because there are no sidewalks and/or access.