Appendix A: Performance Metric Methodologies

The following sections describe the methodologies employed to evaluate existing and future conditions, as they related to the Smart Mobility Framework objectives.

1.1 Smart Mobility Framework

Caltrans' *Smart Mobility Framework 2010: A Call to Action for the New Decade* provides a broad planning framework to guide multimodal and sustainable transportation planning and project development. It also provides tools to assess how plans, programs, and projects meet Smart Mobility goals throughout the State. The Smart Mobility Framework process is consistent with both the 2018 Comprehensive Multimodal Corridor Plan Guidelines and the SB 1 Solutions for Congested Corridors Program Guidelines from the California Transportation Commission (CTC).

Smart Mobility moves people and freight while enhancing California's economic, environmental, and human resources by emphasizing convenient and safe multimodal travel, speed suitability, accessibility, management of the circulation network, and efficient use of land. In an effort to recommend improvements that aim to achieve a balanced and safe mobility system for the RTTAP Study Area, Smart Mobility objectives have been implemented to guide the planning process and transportation improvement project recommendations. The Smart Mobility Framework is premised on the following six key objectives:

- Location Efficiency
- Reliable Mobility
- Health and Safety
- Environmental Stewardship
- Social Equity
- Robust Economy

1.1.1 Performance Metrics

Performance metrics were selected to evaluate existing and future conditions to determine the potential benefits associated with preferred RTTAP multimodal improvement package. The performance metrics are coordinated with the six objectives outlined in the Smart Mobility Framework to ensure the resulting improvement recommendations provide a balanced, sustainable, and multimodal assessment of current and future corridor conditions. Requisite metrics include bicycle level of traffic stress scores; bicycle mode shift; vehicular delay reduction; vehicular travel time; crash reduction; health cost savings; vehicle emissions reduction; network vulnerability and sustainability; equitable distribution of benefits/impacts; return on investment, and "value of time" metrics including recreational activity and mobility benefit, as shown in Table 1.

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Table 1 – Smart Mobility Objectives and Performance Metrics

Smart Mobility Objective	Analysis Purpose	RTTAP Performance Metric
Location Efficiency	Bicycle Connectivity	Bicycle Level of Traffic Stress
	Multimodal Facility Access	Bicycle Mode Share (# New Trips)
Reliable Mobility	Roadway Operations	Delay Reduction (Motorized/Non-Motorized)
	Roadway Service Quality	Vehicular Travel Time
Health and Safety	Safety	Crash Reduction (Roadways & Intersections)
	Health	Health Cost Savings (per Capita)
Environmental Stewardship	Air Quality	Vehicle Emissions Reduction
	Adaptation	Network Vulnerability & Sustainability
Social Equity	Social Equity	Equitable Distribution of Benefits/Impacts
Robust Economy	Economic Development	Return on Investment
All	Community Livability	Recreational Activity (Value of Time)
		Mobility Benefit (Value of Time)

These performance metrics were used to establish an existing conditions baseline to inform an initial needs-assessment and were subsequently used to analyze future conditions with and without the RTTAP transportation improvement projects. Results from these analyses were used to establish the benefits associated with the preferred RTTAP multimodal improvement package (as presented in Chapter 6 of this plan). The performance metric methodologies employed to evaluate existing and future conditions are described in Appendix A.

Many of these performance metrics do not have established standards but were analyzed to better understand the existing and future operational characteristics the RTTAP and inform benefit/cost assessments for recommended transportation improvement projects. Use of additional metrics other than vehicular Level of Service (LOS) is consistent with the Smart Mobility Framework and with the recent Senate Bill (SB) 743 intended to streamline the California Environmental Quality Act (CEQA) process. Some metrics such as vehicular delay, collision reduction, mode shift, and vehicle miles of travel reduction can be monetized and were incorporated into a benefit-cost analysis. Other quantifiable indices, such as suitability scores (i.e. level of traffic stress analysis), adaptation

assessments, economic development assessments, and environmental justice impacts, etc. are not conducive to being monetized.

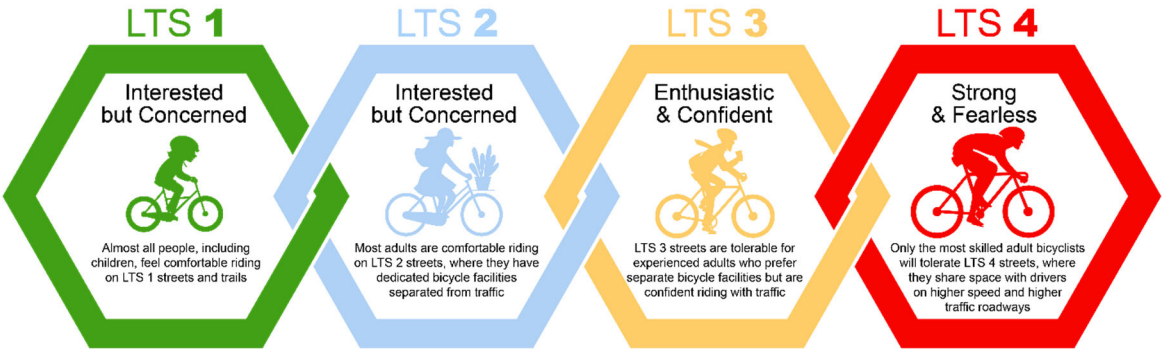
1.1.2 Location Efficiency

1.1.2.1 Accessibility and Connectivity

Bicycle Level of Traffic Stress (Bicycle LTS) measures a bicyclist's perceived sense of risk associated with riding in or adjacent to vehicle traffic. The objective is to provide a connected network of low-stress bicycle facilities within the study corridor.

Level of Traffic Stress (LTS) are calculated for roadway segments and intersections using the methods documented in the paper, *Low Stress Bicycling and Network Connectivity*, Mineta Transportation Institute, Report 11-19, May 2012. Bicycle LTS quantifies the stress level of a given roadway segment by considering a variety of criteria, including street width (number of lanes), speed limit or prevailing speed, presence and width of bike lanes, and the presence and width of parking lanes. Bicycle LTS is a suitability rating system of the safety, comfort, and convenience of transportation facilities from the perspective of the user. Moreover, the methodology allows planning practitioners to assess gaps in connectivity that may discourage active users from traversing roadways.

Bicycle LTS scores roadway facilities into one of four classifications or 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 (see Figure 4.6). Generally, LTS score of 1 indicates the facility provides a traffic stress tolerable by most children and less experienced riders, such as multi-use paths that are separated from motorized traffic. An LTS score of 4 indicates a stress level tolerable by only the most experienced cyclists who are comfortable with high-volume and high-speed, mixed traffic environments. LTS 3 and 4 represent high stress conditions for bicyclists and reflect the need for visibility and safety improvements. The figure below presents the four scoring classifications, subsequent tables show the criteria associated with determining the LTS score.



The Bicycle LTS methodology is comprised of three scoring categories: roadway segments, intersection approaches where right turn lanes exist, and unsignalized intersection crossings. The Bicycle LTS scoring criteria for intersection approaches where right turn lanes exist, for roadway segments with mixed traffic, and for roadway segments where bike lanes exist are provided in the Tables below.

Table 2 LTS Criteria for Intersection Approaches with Right Turn Lanes

Right-turn Lane Configuration	Right-turn lane length (ft)	Bike Lane Approach Alignment[2]	Vehicle Turning Speed (mph)[3]	LTS Score
With Pocket Bike Lane				
Single	≤ 150	Straight	≤ 15	LTS 2
Single	>150	Straight	≤ 20	LTS 3
Single	Any	Left	≤ 15	LTS 3
Single[1] or Dual Exclusive/ Shared	Any	Any	Any	LTS 4
Without a Pocket Bike Lane				
Single	≤ 75		≤ 15	(no effect on LTS)
Single	75-150		≤ 15	LTS 3
Otherwise				LTS 4

[1] Any other single right turn lane configuration not shown above.

[2] The right turn criteria are based on whether the bike lane stays straight or shifts to the left.

[3] This is vehicle speed at the corner, not the speed crossing the bike lane. Corner radius can also be used as a proxy for turning speeds.

[4] There is no effect on LTS if the bikeway is physically separated from traffic, as on a shared-use path.

Table 3 LTS Criteria for Mixed Traffic

	Street Width		
Speed Limit	2-3 lanes	4-5 lanes	6+ lanes
Up to 25 mph	LTS 1 or 2[1]	LTS 3	LTS 4
30 mph	LTS 2 or 3[1]	LTS 4	LTS 4
35+ mph	LTS 4	LTS 4	LTS 4

[1]Use lower value for streets without marked centerlines or classified as residential and with fewer than 3 lanes; use higher value otherwise.

Table 4 LTS Criteria for Bike Lanes

Lane Factor	LTS Score			
	LTS 1	LTS 2	LTS 3	LTS 4
Alongside a Parking Lane				
Street width (through lanes per direction)	1	(no effect)	2 or more	(no effect)
Sum of bike lane and parking lane width (includes marked buffer and paved gutter)	15 ft. or more	14 or 14.5 ft.[2]	13.5 ft. or less	(no effect)
Speed limit or prevailing speed	25 mph or less	30 mph	35 mph	40 mph or more
Bike lane blockage (typically applies in commercial areas)	rare	(no effect)	frequent	(no effect)
Not Alongside a Parking Lane				
Street width (through lanes per direction)	1	2, if directions are separated by a raised median	more than 2, or 2 without a separating median	(no effect)
Bike Lane Width (includes marked buffer and paved gutter)	6 ft. or more	5.5 ft. or less	(no effect)	(no effect)
Speed limit or prevailing speed	30 mph or less	(no effect)	35 mph	40 mph or more
Bike lane blockage (typically applies in commercial areas)	rare	(no effect)	frequent	(no effect)

Note: [1] (no effect) = factor does not trigger an increase to this level of traffic stress.

[2] If speed limit < 25 mph or Class = residential, then any width is acceptable for LTS 2.

1.1.2.1 Bicycle Mode Share

To estimate the induced demand associated with the bicycle improvements proposed in the study corridor, the National Cooperative Highway Research Program (NCHRP) 552 methodology provided in the Guidelines for Analysis of Investment in Bicycle Facilities was utilized. The analysis quantifies the induced demand mode shift (induced demand) associated with the proposed improvements, and monetizes the annualized mobility, health, recreation and decreased auto use benefits provided by the projected mode shift at high, moderate and low estimates. Bicyclists are more likely to use a facility if they live within a 1.5 mile buffer than if they live outside of this distance. Moreover, the highest likelihood of a member of the population to use the facility exists if they live within a 0.5 mile buffer around the facility. The NCHRP 552 methodology suggests that bicycle commute mode share can be utilized to estimate the number of existing and future bicycle ridership based on the population, and low, moderate, and high likelihood multipliers at 1.5 mile, 1 mile, and 0.5 mile buffers that surround a facility. Each buffer area—at 0.5, 1 and 1.5 mile buffers

from the proposed improvements was created using a network-based analysis in a GIS environment. Benefit values are based on the following assumptions:

- Existing cyclists near a new facility will shift from a nearby facility to a new facility
- The new facility will induce new cyclists as a function of the number of existing cyclists relative to the attractiveness of the proposed facilities

To estimate future bicycle ridership, the population near the improvements was calculated using block level population data from the 2018 American Community Survey (ACS) 5-Year estimates, and distance buffers of 0.5 miles, 1 mile and 1.5 miles based on the NCHRP Report 552 methodology. 2018 population estimates were utilized as baseline population estimates. Population growth rates were calculated using the land use data by TAZ found in the 2015 and 2045 Greater Eureka Area Travel Model (GEATM) travel demand models and applied to the baseline to estimate future population. The total population within each buffer distance range near the proposed improvements was estimated by multiplying the proportion of area of each buffer to the area of the whole block by the estimated block population.

Using the estimated population and the sketch planning method presented in Appendix A of NCHRP Report 552, existing bicycle rates and the mobility, health, recreation, and decreased auto use benefits at high, moderate and low levels were estimated.

1.1.3 Reliable Mobility

Forecasted corridor conditions produced results for vehicle miles of travel and travel time, travel time index (TTI), and delay.

1.1.3.1 Multimodal Service Quality

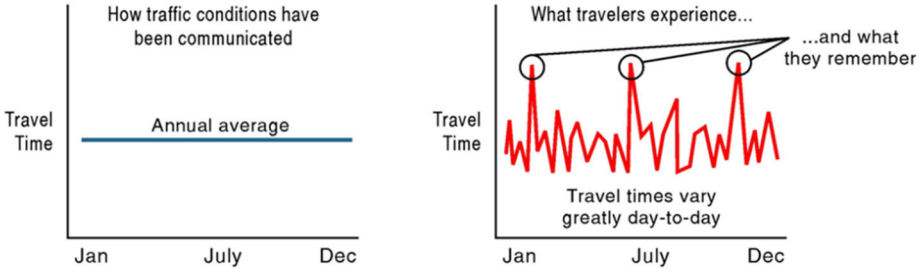
Baseline and forecasted service quality in the RTTAP was empirically based using INRIX and the National Performance Monitoring Research Data Set (NPMRDS) travel time data sets. The Federal National Performance Rule Congestion Threshold performance measure was used to determine the performance of roadway segments within the study corridor: Uncongested (>= 60 % of free-flow) vs. Congested (< 60% of free-flow). Under the federal definition, a roadway is considered congested if peak period travel speeds fall below 60% of free flow speeds. This includes delays experienced at intersections. The analysis is based on NPMRDS speed data collected over a two-year period and reflects the AM/PM peak hours. Given that free flow speed is a key variable for calculating this performance measure, free flow speed was empirically estimated for each roadway segment using NPMRDS data between the hours of midnight and 3 AM.

1.1.3.2 Intersection Operations

Intersection operations were quantified using Synchro software through the determination of Level of Service (LOS) at key intersections. LOS is a qualitative metric that describes the experience of motorists. Intersections and approaches are assigned scores from “A” through “F” with A being free-flowing traffic with little to no congestion and F being highly congested. LOS criteria are established to determine whether a given roadway facility is providing the desired quality of service. The methodologies used to determine LOS (i.e. delay, speed, density) were based on the Highway Capacity Manual (HCM) 6th Edition. Caltrans operating standards have been applied that identify the cusp between LOS C and D as the acceptable threshold for RTTAP.

1.1.3.3 Multimodal Service Reliability

Travel time reliability is defined as the variation in travel time for the same trip from day to day ("same trip" implies a trip made with the same purpose, from the same origin, to the same destination, at the same time of the day, using the same mode, and by the same route). If variability is large, the travel time is considered to be unreliable, because it is difficult to generate consistent and accurate estimates for it. If there is little or no variation in the travel time for the same trip, the travel time is considered to be reliable.



Future buffer times are proportional to correlation between Travel Time Index (TTI) between existing condition and future conditions. Average travel time in calculation of TTI (which is a ratio of average travel time and free flow travel time) was generated by adjusting National Performance Management Research Data Set (NPMRDS) observed travel times by results from Synchro traffic analysis while the free flow travel time was calculated based on an average speed of 45 miles per hour throughout the corridor. The following performance metrics for passenger vehicles were generated:

- Buffer time
- Buffer time index

Both the national rule's definition of reliability (based on 80th percentile speed) and the HCM definition of reliability (based on 95th percentile speed) were applied.

Federal definitions from the National Performance Management Measures Rule were used to define reliability. Both the national rule's definition of reliability (based on 80th percentile speed) and the HCM definition of reliability (based on 95th percentile speed) were applied. Buffer Time represents the additional time a motorist needs to budget for to ensure they arrive at their destination at the expected time 95% of the time. Buffer Time Index (BTI) simply normalizes Buffer Time for distance and is expressed as a ratio or percentage (added percent of time required). A higher BTI indicates more time drivers need to budget for to drive the corridor as a typical drive time becomes less reliable. BTI equal to or greater than 0.5 indicates that a motorist will need to budget 50+ percent more time over the normal travel window (i.e., departing earlier) to ensure an on-time arrival 95 percent of the time (i.e., equates to allowing for one late arrival for every 30 trips). Table 5 displays the Buffer Time Index thresholds as they relate to reliability.

Table 5 Buffer Time Index Thresholds

Reliable	Moderately Reliable	Unreliable
BTI[A] < 0.25	BTI[A] 0.25 – < 0.5	BTI[A] > = 0.5

[A] Buffer Time Index – A measure of reliability, measures percentage of travel time devoted to being on time above average travel time.

To estimate the change in reliability (buffer time only) as a result of the RTTAP improvement concepts, the change of travel time reliability was holistically projected for each RTTAP alternative under future year conditions. The relative change in the Travel Time Index (TTI) between baseline and future was applied to adjust the empirically based NPMRDS baseline estimate of buffer time. This assumes that the effect of construction, weather, and incidents reflected in the most recent 12-24 months of NPMRDS data is reasonably reflective of the frequency of like events in the future.

1.1.4 Health and Safety

1.1.4.1 Design and Speed Suitability (i.e., Crash Reduction Potential of Infrastructure Improvements)

Based on the contributing factors from the baseline crash hot-spot assessment, Parts B and D of the Highway Safety Manual (HSM) 2010 were applied to identify location-specific and corridor-wide countermeasures. At intersections, Part C of the HSM was applied to estimate the potential safety performance and crash reduction potential of identified infrastructure design treatments. Vehicular and bicycle/pedestrian related crashes and countermeasures identified to improve safety were summarized for input into the Highway Safety Improvement Program (HSIP) analyzer to compute anticipated crash reduction. Estimated crash reductions are then monetized using societal cost estimates from the Caltrans 2018 Economic Parameters.

1.1.5 Social Equity

1.1.5.1 Equitable Distribution of Benefits and Impacts

A qualitative assessment of the distribution of benefits (i.e., access to and utilization of) and impacts (construction, environmental, and right-of-way impacts) of the proposed future transportation investments in the RTTAP relative to advantaged and disadvantaged communities was determined using disadvantaged and/or low-income communities web-based mapping resources, per SB 535.

1.1.6 Robust Economy

1.1.6.1 Return on Investment

To provide an indication of the projected return on investment of the proposed investment in the RTTAP, a holistic 20-year life cycle benefit-cost (B/C) metric is computed based on the net present value (i.e. life cycle duration using a discount rate of four percent) incorporating the following five measures of effectiveness:

- Safety Benefit (predicted crash reduction)
- Health Benefit (mode shift to active transportation)

- Vehicle Emission Reduction Benefit (vehicular delay reductions)
- Operations and Maintenance Costs
- Initial Capital Costs

Monetized benefits were based on the 2018 societal cost parameters developed by Caltrans. Improvement costs (capital and operations and maintenance) used a format based on Caltrans preparation guidelines for developing project planning cost options.

The following assessments, though qualitative, relate to the robust economy objective given the importance of ensuring and protecting the integrity and sustainability of the proposed RTTAP investment.

1.1.6.2 Economic Development

An economic assessment using IMPLAN economic multipliers of the short- and long-term economic impacts of the proposed investments in the RTTAP on Gross Regional Product, job creation and income.

1.1.6.3 Plan/Policy Consistency

A qualitative assessment of the degree that the proposed investments in the RTTAP are politically and institutionally feasible and implementable.

Appendix B:
Public Workshop Summaries

Phase 1 (Workshops #1 and #2) summary provided.
Additional summaries are forthcoming.

MEMO

TO: Gary Mills, GHD, Project Manager
Kristine Cai, FCOG Project Manager

FROM: Kim Anderson, RGS Senior Advisor
Task Manager for Public Outreach

DATE: April 1, 2020

RE: Phase 1 Outreach Interim Report April 2020 Update

Introduction:

This memorandum summarizes public input received to date during Phase 1 of the public outreach effort for the Reverse Triangle Transportation Area Plan. This phase of outreach included monitoring and updating the dedicated project website and on-line interactive mapping tool, analyzing the first public workshop findings, publicizing and conducting the second public workshop, and continuing to promote the follow-on virtual workshop for those unable to attend the live workshop. The project team is currently updating the public participation plan to include more virtual and on-line elements. A final report will be provided at the end of the Phase 1 process.

Workshop #1:

Date: November 23, 2019

Project Team Staff in Attendance: Kendall Flint (RGS), Kim Anderson (RGS), Gary Mills (GHD), Joe Ramirez (GHD), Kristine Cai (Fresno COG), Braden Duran (Fresno COG)

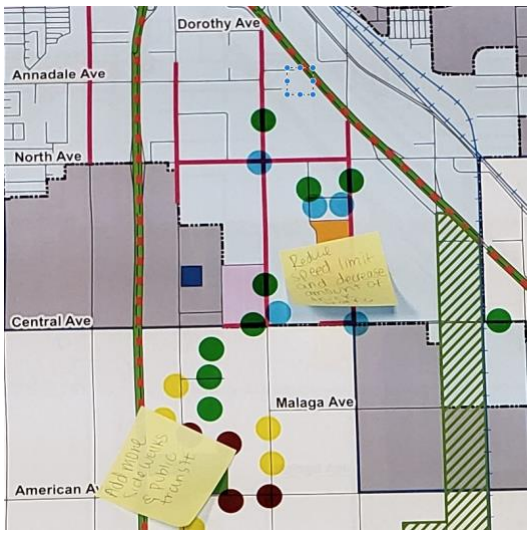
The workshop set-up included a project overview presentation, interactive mapping station, map exhibit stations (both background maps and project area section maps), and a final click

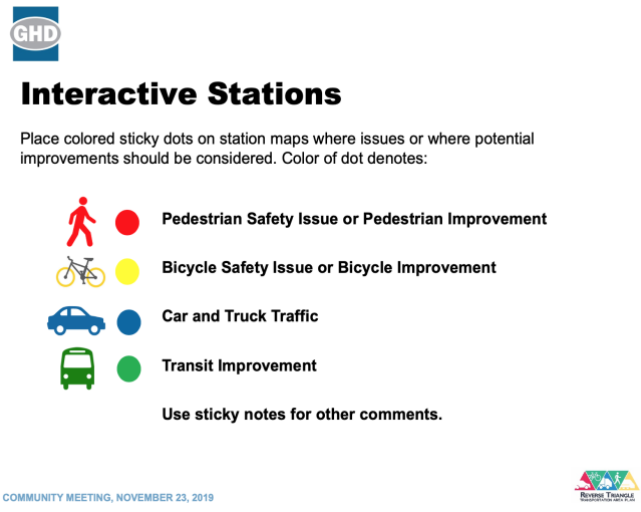
polling activity to gain input from attendees (see Attachment A: Workshop Overview for additional detail).

The workshop was promoted via press release to local media, through flyers, postcards, and project cards; on various social media outlets; and by email blasts.

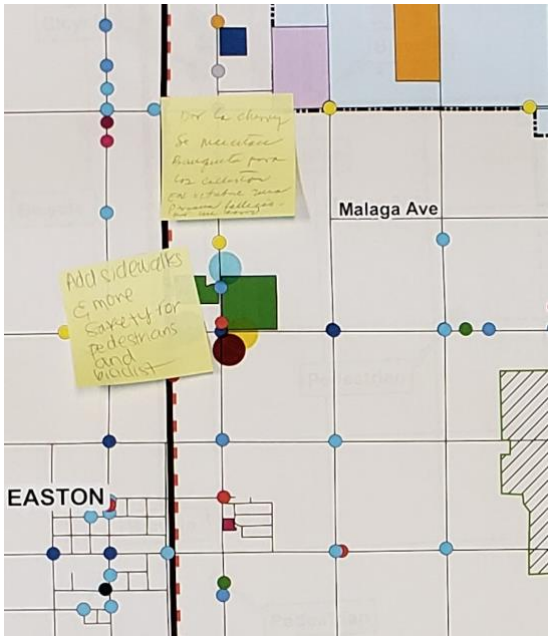
Of the individuals on the workshop sign-in sheet, approximately 20 were active participants and answered the polling section of the presentation. A full report of the workshop survey responses is included as Attachment B.

Workshop Stations Summary:

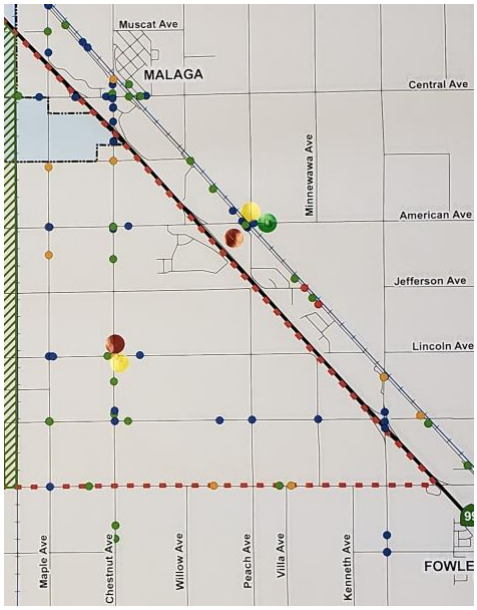




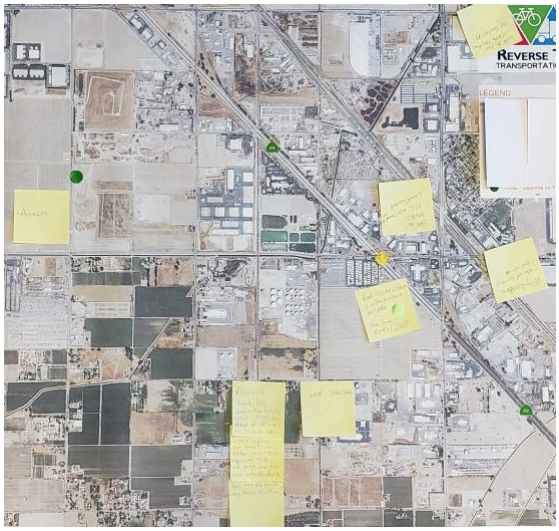
Map	Dot Type	Location	Landmark
Bikeways	Transit Improvement (1)	S. East Ave between Annadale & North	Pepsi Bottling
Bikeways	Car & Truck (1)	North Ave @ South East Ave	Intersection
Bikeways	Transit Improvement (2); Car & Truck (2)	S Orange Ave between Central & North Avenues	Amazon Distribution
Bikeways	Car & Truck	South Orange & Central	Intersection
Comment: Reduce speed limit & decrease truck traffic			
Bikeways	Transit Improvement	Central Avenue, between South Cedar & South Maple Streets	Future HSR Maintenance Facility
Bikeways	Car & Truck (2); Transit Improvement (1)	South East Avenue @ Central Ave	Ulta Distribution
Bikeways	Transit Improvement (3); Pedestrian Issue or Improvement (4); Bicycle Issue or Improvement (5)	South Cherry Avenue & South Avenue, between Central & American Avenues	Cherry Avenue Auction
Comment: Add more sidewalks & public transit			



Map	Dot Type	Location	Landmark
RW Class	Transit Improvement (1); Pedestrian Issue or Improvement (1)	North Avenue @ East Avenue	Intersection
RW Class	Car & Truck (1)	North Avenue @ S Cedar	Intersection
RW Class	Transit Improvement (1)	S Cherry Avenue between North & Central Avenues	Orange Center School
Map	**Dot Type**	**Location**	**Landmark**
PC Factor	Post It Note (Other)	Central Ave @ SR 41	Intersection
Comment (Translated From Spanish): Placeholder – translation pending			
PC Factor	Car & Truck (1); Pedestrian Issue or Improvement; Bicycle Issue or Improvement	S Cherry Avenue, near American Ave	Cherry Avenue Auction
Comment: Add sidewalks and more safety to pedestrians and bicyclists			
RW Class	Pedestrian Issue or Improvement	Cherry Ave between Central & American Avenues (E Britten Ave)	Cherry Avenue Auction
Comment: There are communities on Britten and Daleville Ave that need basic infrastructure of bike lanes, sidewalks			
RW Class	Bicycle Improvement or Issue (1); Pedestrian Improvement or Issue (1)	S East Ave, north and south of American	Future HSR Maintenance Facility
RW Class	Car & Truck (2); Transit Improvement (1)	South E. Avenue @ Central Ave	Ulta Distribution
RW Class	Transit Improvement (3); Pedestrian Issue or Improvement (4); Bicycle Issue or Improvement (5)	South Cherry Avenue & South Avenue, between Central & American Avenues	Cherry Avenue Auction
Comment (Translated from Spanish): Transportation needed for daily commute to work and would be considered more secure than walking especially when carrying groceries. Security for walkers, motorists don't respect right of way of walkers. Could avoid collisions (deaths) with walkers.			
RW Class	Transit Improvement (4)	Cedar Ave between American & Lincoln	Corridor
RW Class	Transit Improvement (5)	South Chestnut Ave between Malaga & American	Corridor
Comment: Add public transit and reduce truck traffic			



Map	Dot Type	Location	Landmark
C Severity	Car & Truck (1); Bicycle Issue or Improvement (1); Pedestrian Issue or Improvement (1)	American Ave @ S Peach Avenue, near South Golden State	Intersection
C Severity	Pedestrian Issue or Improvement; Bicycle Issue or Improvement	S Chestnut Avenue @ Lincoln Ave	Intersection



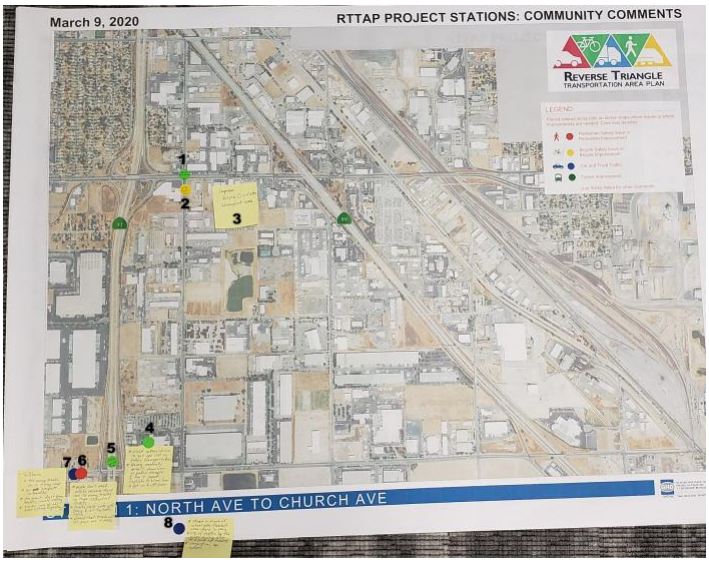
Map	Dot Type	Location	Landmark
Sub-Area 2 Table 1	Transit Improvement (1)	S Orange Avenue between East North & Central Avenues	Amazon Distribution
Sub-Area 2 Table 1	Bicycle Issue or Improvement (1); Transit Improvement	Church Avenue @ SR 99	Intersection
Comment 1: Road construction & infrastructure terrible. One-lane roads/dust			
Comment 2: SBR for trucks; EBL turn [not readable] Chestnut/Central			
Comment 3: Polling Question – use ped beacons – grade separation			
Comment 4: Loss of low-income residences at Central/99			
Sub-Area 2 Table 1	Post-It Note Comments	Malaga Ave S Cedar & S Maple Aves	FedEx
Comment 1: Racoville property has been in the family since the 1930s. Almost all of us are related. We cannot replace our homes in another area. Too expensive. Traffic and dust due to poor infrastructure. How can we handle any more traffic?			
Comment 2: Dust - shoulders			

Map	Dot Type	Location	Landmark
Sub-Area 2 Table 2	Car & Truck (4); Pedestrian Issue or Improvement (5)	Central & North Avenues between South Cherry & South Orange Avenues	Amazon & Ulta Distribution
Comment: Reduce speed lmt and add more pedestrian safety. Add public transportation.			
Sub-Area 2 Table 2	Car & Truck (1)	2109 E. Malaga Rd	Gary Raco Property
Comment: What will this land end up being like after American & Central are completed with overpasses. Will it be closed without improvement or will be improved upon completion?			
Sub-Area 2 Table 2	Car & Truck (1)	E Central @ Hwy 99	Mobile Home Park
Comment: Low-income mobile home residents will be displaced if Caltrans interchange project implemented on Central & new & more truck volume & VMT			
Sub-Area 2 Table 2	Car & Truck (3)	E Central Ave between Hwy 99 & South Peach Ave	Malaga
Comment 1: High truck traffic on Malaga/parking of non-residents to serve surrounding industrial			
Comment 2: Planned & new truck stop/parking in Malaga will increase truck impact on roadway safety, health			
Comment 3: Biomass & glass factory (Malaga) served by truck traffic			

WORKSHOP #2

Date: March 9, 2020

Project Team Staff in Attendance: Kim Anderson (RGS), Gary Mills (GHD), Joe Ramirez (GHD), Kristine Cai (Fresno COG), Braden Duran (Fresno COG)



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The workshop was promoted via press release to local media, through flyers, postcards, and project cards; on various social media outlets; and by email blasts to previous attendees and project area employers.

Of the 20 individuals on the workshop sign-in sheet, approximately 13 were active participants and answered the polling section of the presentation. A full report of the workshop survey responses is included as Attachment B.

Station 1: Church Ave to North Ave

1. Improve bus times (Transit Improvement)
2. Bike lanes all over (Bicycle Safety Issue for Bicycle Improvement)
3. Improve bicycle circulation throughout the area
4. a. Would rather drive to not get lost on public transportation
   b. Hmong residents aren't familiar with public transportation and don't speak English to know on & off and costs
5. More lanes (Transit Improvement)
6. a. People don't walk outside because there are too many trucks on these residential streets
   b. Trucks have made wide turns & hit traffic lights
   c. Afraid that trucks will hit your car or people
7. a. Too many trucks on a 2-way road
   b. No complete sidewalks
   c. Too much dust from traffic; unsafe walking
   d. Trucks run at all hours/time (night/day)
8. a. Street in front of the school gets flooded when there is rain
   b. Lots of traffic by the school during drop offs & pick ups hours
   c. Congestion by school

Station 2: North Ave to American Ave

1. Car and Truck Traffic
2. Car and Truck Traffic

3a. Enforcement (peds) near Cherry Ave Auction

3b. Pedestrian Safety Issue or Pedestrian Improvement

4. Bicycle Safety Issue for Bicycle Improvement
5. Car and Truck Traffic
6. Pedestrian safety by Orange Center school & bicycle
7. Widen Orange to 4-lanes Central to North
8. Cedar from North to Center widen to 4-lanes
9. Match what Caltrans is doing w/new project
10. Car and Truck Traffic
11. Car and Truck Traffic
12. Bus routes (Transit Improvement)

13a. Bicycle Safety Issue for Bicycle Improvement

13b. Pedestrian Safety Issue or Pedestrian Improvement

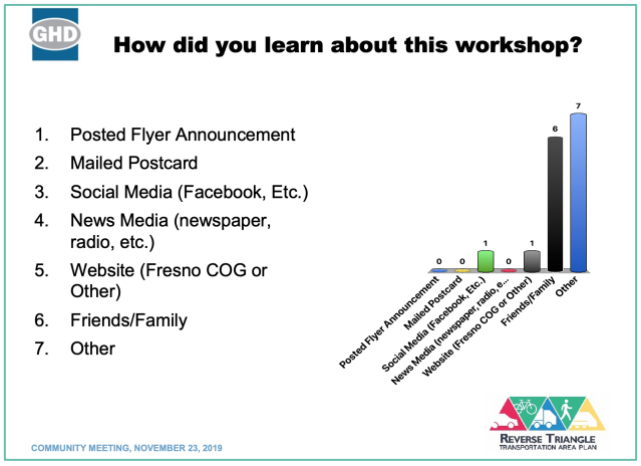
14. Car and Truck Traffic
15. Car and Truck Traffic
16. Pedestrian Safety Issue or Pedestrian Improvement
17. Complete bike paths (Bicycle Safety Issue for Bicycle Improvement)
18. Car and Truck Traffic
19. Bus routes (Transit Improvement)
20. Transit Improvement
21. Transit Improvement
22. a. Traffic to/from Cherry Auction does not allow residents from Bretten Ave to enter/leave.
    b. Too congested for emergency services to enter or leave
23. Speed bumps (needed)
24. Accident due to high speed, hit my fence, my father walks the path
25. Car and Truck Traffic
26. Pedestrian Safety Issue or Pedestrian Improvement

27. Car and Truck Traffic
28. Bus stops along employment corridors
29. Car and Truck Traffic
30. Need fire station w/in area, better response times
31. Widen Central to 4-lanes (SR-41 Golden State)
32. Car and Truck Traffic
33. Car and Truck Traffic
34. Car and Truck Traffic
35. Car and Truck Traffic
36. Bus route/shuttle (Transit Improvement)
37. Cross traffic peds (Pedestrian Safety Issue or Pedestrian Improvement)
38. Car and Truck Traffic
39. a. Traffic from/to Cherry Auction is very congested.
    b. Residents are squeezed out/in from Cherry. Too much!!
40. Car and Truck Traffic
41. Bike paths should start at intersections not half the street, bike path sidewalks to Cherry Auction

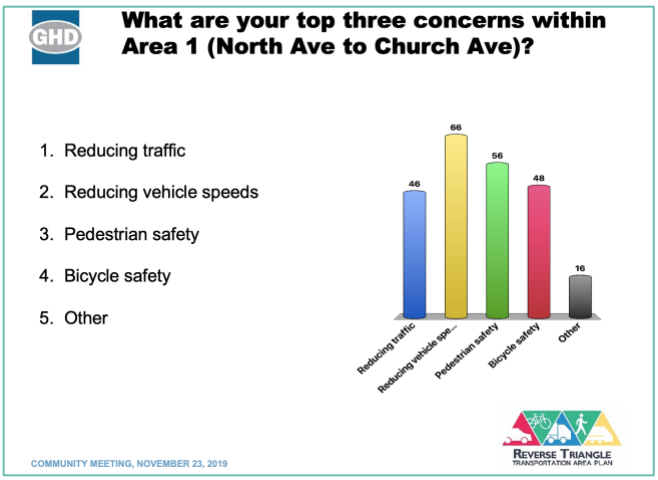
Station 3: American Ave to Adams Ave

1. Car and Truck Traffic
2. Bus route to WUHS (Washington Union High School) - Transit Improvement

Key Findings from Workshop Polling (both workshops):



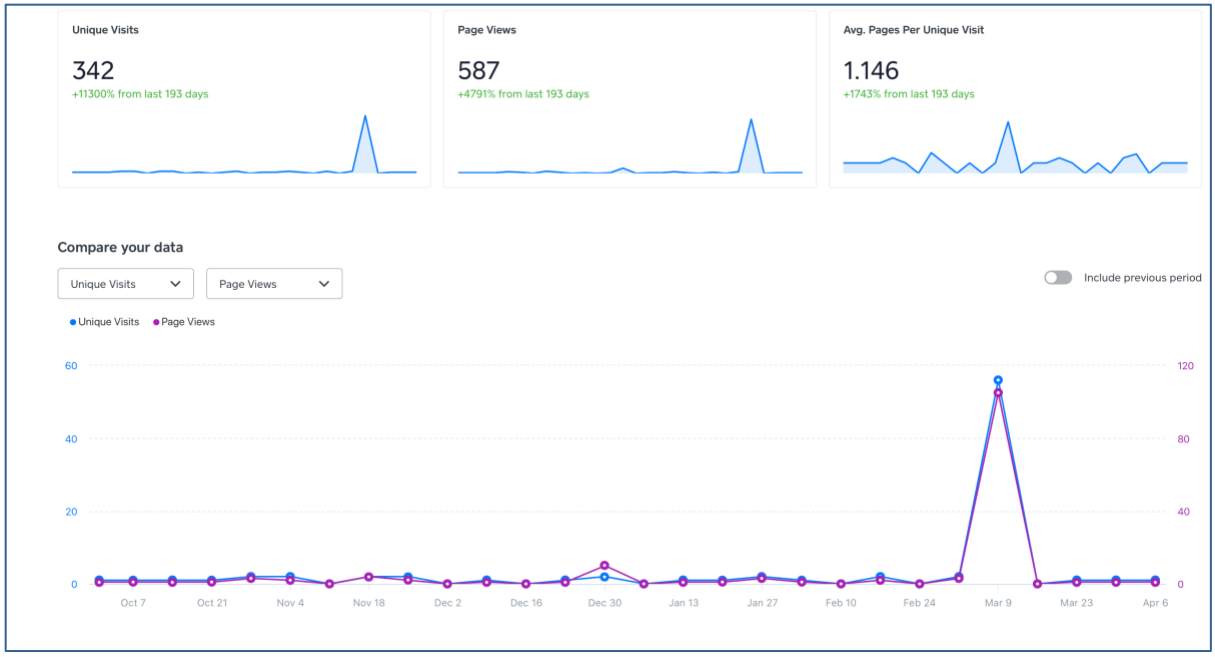
- Most participants found out about the workshop from friends/family or through other means
- Good representation of all age groups
- The majority of respondents did not live or work in the study area.
- While there is some support for pedestrian and bicycle improvements, survey responses indicate that many destinations are too far to walk, or bike and/or respondents would rather drive

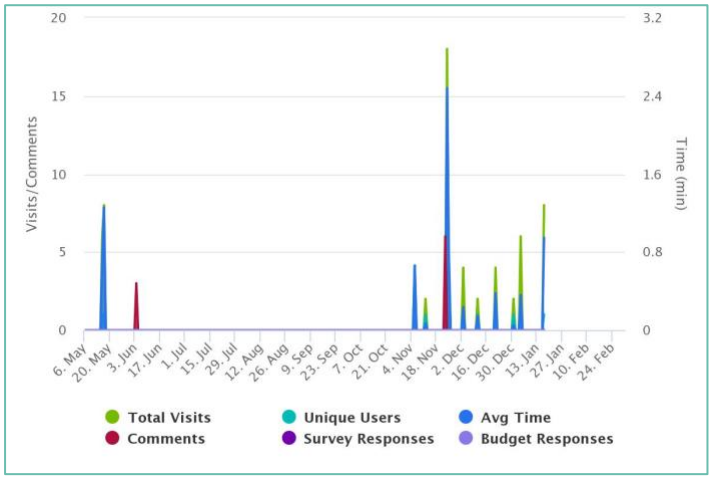


- When asked for their top two ***safety*** concerns, respondents cited pedestrian, auto, and bike safety as their top two concerns
- Speed reduction and traffic congestion are the top two concerns in all three sub-areas polled
- Top three needs participants identified in the study area are roadway improvements to reduce speeds, sidewalks, and bike lanes and/or separated paths.

Virtual Workshop:

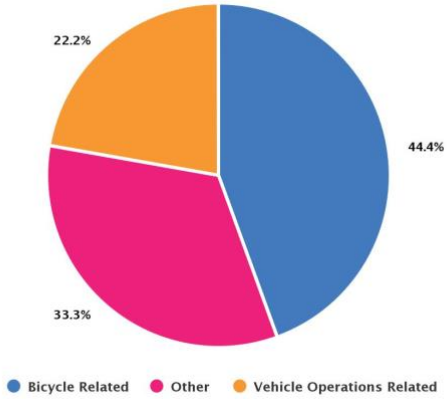
Website Analytics (October 22-April 10): 342 Unique Visitors with 587 webpage views. The virtual survey and workshop exhibits were added to the website approximately one week after the workshop. To date no virtual survey responses or comments have been received.





Interactive Mapping Tool (Social Pinpoint)

Summary: The interactive map tool has been live on the project website since the week prior to the November 23 workshop. Description and graphics in the mapping tool mirror the maps displayed on the website with some additional information to clarify map feature locations.



Through April 1, the mapping tool has produced 157 total visits with 56 unique users; 13 of those users left comments. Comments received were broadly categorized as bicycle related, traffic operations related, or other and are summarized in the graphic at right.

Three of the comments identified bicycle accident locations. The remaining six comments are summarized below:

Comment Translated from Spanish: We need more looks, the street is dark, tree blocking the only light on
This is a community of residents that do not have sidewalks, wide enough streets, nor bike lanes.
Roy Ave end of street
need signal, highway patrol, directing traffic to north, during Cherry Auction (congestion)
Seek funding to plant more trees.
All of S Cherry Ave has increase Heavy duty truck traffic that can't be sustained on just 2 lanes. Speed of trucks, the dust they whip up, no sidewalks, unpaved county roads are all hazards for residents

These comments will be incorporated into the workshop map comments at the end of the phase 1 outreach.

Next Steps:

The project team will continue outreach efforts to encourage more survey responses from the virtual workshop platform and will continue to promote the on-line interactive mapping tool during the remainder of the Phase 1 outreach effort. A particular effort will be potential pop-up events and presentations to civic, community, and faith-based groups, as well as another press release, email blast, and social media postings. Many of the meetings will move to a virtual format, given current shelter-in-place and social distancing protocols currently in place.

Appendix C: Baseline Conditions Memorandums

Baseline Conditions Memorandums are available via the RTTAP project website: https://www.fresnocog.org/reverse-triangle-transportation-area-plan-study/

Appendix D: Employment and Commute Assessment

Memorandum

March 15, 2021

To:	Gary Mills, GHD Makinzie Clark, GHD	Project:	Reverse Triangle Transportation Area Plan (RTTAP)
From:	Paige Thornton, GHD	Ref/Job No.:	11192258/2618
CC:			

Subject: RTTAP Employment and Commute Assessment

1. Introduction

The Reverse Triangle Transportation Area Plan (RTTAP) study area includes the area north of Adams Avenue, west of State Route (SR) 99, east of SR 41, and south of where the two highways converge in the southern extent of the City of Fresno. A portion of the northern study area is within the city's sphere of influence, while the remainder is within unincorporated Fresno's County.

Top employers within the study area include Taylor Communications, Ulta, Amazon, and Mission Foods, which combined account for more than half of study area jobs. The predominant industry sector of the almost 10,000 jobs associated with the study area is manufacturing, followed by Retail Trade, which brings a fair amount of truck traffic to the area.

The commute characteristics of employees, the location of major employers, and the impact of goods movement associated with job centers in the study area is vital in understanding travel patterns and transportation needs within the Reverse Triangle. This memorandum presents the job profile, as well as the commute flows of the employed individuals who either live and/or work in the study area. The data analyzed and presented herein is sourced from the U.S. Census Longitudinal Employer-Household Dynamics (LEHD) On the Map data sets for 2018.

GHD
2200 21st Street Sacramento California 95818 United States
T +1 916 372 6606 **W** www.ghd.com

2. Study Area Job Profile

The study area, which is comprised of almost 15 square miles and 139 Census blocks, is associated with 9,774 employees who either live and/or work in the study area. These 9,774 employees encompass all jobs associated with the study area, including jobs of employees who work and live in the study area, those who live within it but work outside of it, or those who live outside of it but work within it.

Error! Reference source not found. presents a heat map of the distribution of study area jobs, which shows where the jobs of workers employed in the study area are located. As seen, most of the jobs within the study area boundaries are concentrated in the northern portion of the study area.

Of the 9,774 employees, the top five North American Industry Classification System (NAICS) industry sectors are presented in Table 1. As shown, manufacturing is the predominant industry sector with 41 percent of the total number of study area employees living and/or working in this sector.

Table 1: Top Industry Sectors in Study Area

NAICS Industry Sector	Total Area Jobs	Percent of Total Area Jobs
Manufacturing	4,046	41.4%
Wholesale Trade	1,510	15.4%
Transportation and Warehousing	1,375	14.1%
Construction	626	6.4%
Retail Trade	491	5.0%

Source: Longitudinal Employer-Household Dynamics (LEHD), U.S. Census, 2018

As seen in Table 2, of the 9,774 employed persons living and/or working in the RTTAP study area, 1,461, or 14.9 percent, are residents of the study area. Of the 1,461 employees living in the study area, 93.3 percent live in the study area but are employed outside, while 6.7 percent both live and work in the study area. Of the total number of workers who are employed in the study area, 99 percent live outside but are employed inside the study area.

Table 2: Distribution of Total Employees Living and/or Working in the Study Area

Employees Living and/or Working in the Study Area	Total # of Jobs	% of Total
Total Employees Living or Working in Study Area	9,774	100.0%
Study Area Employed Residents	1,461	100.0%
Living in the Study Area but Employed Outside	1,363	93.3%
Living and Employed in the Study Area	98	6.7%
Study Area Employed Persons	9,774	100.0%
Living and Employed in the Study Area	98	1.0%
Living Outside of the Study Area but Employed Inside	9,676	99.0%

Source: Longitudinal Employer-Household Dynamics (LEHD), U.S. Census, 2018

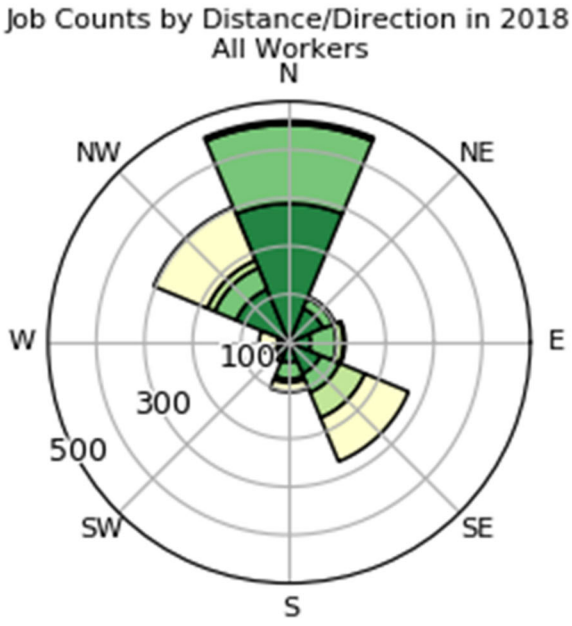
3. Study Area Commute Flows

3.1 Workers

Most workers who travel into the study area for work live within the City of Fresno and surrounding Fresno County cities. With roughly 41 percent of employees associated with the study area living to the north in the City of Fresno, the City is the predominant home destination among this population. About 6 percent of the total number of employees live in the City of Clovis, while each of the Cities of Sanger, Selma, and Madera are home to 2 percent of workers. The remainder of the study area's employed persons live mostly in nearby cities dispersed within Fresno County, Madera County to the north, or Tulare County to the south, with some living in locations beyond these boundaries.

Figure 1 shows the distance and direction of the distribution of home destinations of study area workers. As shown below, 46.5 percent of study area workers live less than 10 miles away, with most traveling to the north of the study area. **Error! Reference source not found.** shows the work to home destinations for study area workers. As seen, many workers live in within Fresno County, with many home destinations concentrated within the City of Fresno and surrounding areas.

Figure 1: Work to Home Destinations by Distance/Direction (Workers)



Jobs by Distance - Home Census Block to Work Census Block

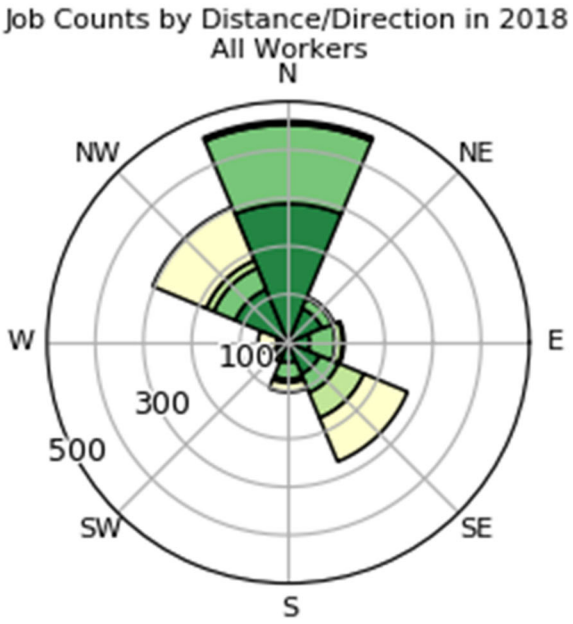
	2018 Count	Share
Total All Jobs	1,461	100.0%
Less than 10 miles	677	46.3%
10 to 24 miles	381	26.1%
25 to 50 miles	115	7.9%
Greater than 50 miles	288	19.7%

3.2 Employed Residents

Of the 1,461 employed persons living within the study area, most work in the City of Fresno, as well as other cities in the County. As shown in **Error! Reference source not found.**, about 46 percent work less than 10 miles from their home destinations. Of the employed study area residents, roughly 39 percent work in the City of Fresno, 4 percent in the City of Clovis, 3 percent in the City of Fowler, and 2 percent in the Cities of Visalia and Selma. The remainder of this population work in other locations within Fresno County and beyond.

Figure 2 displays the home to work destinations for employed RTTAP study area residents. As shown, many employed study area residents work in the City of Fresno and other Fresno County cities.

Figure 2: Work to Home Destinations by Distance/Direction (Employed Residents)



Jobs by Distance - Home Census Block to Work Census Block

	2018 Count	2018 Share
Total All Jobs	1,461	100.0%
Less than 10 miles	677	46.3%
10 to 24 miles	381	26.1%
25 to 50 miles	115	7.9%
Greater than 50 miles	288	19.7%

Appendix E: IMPLAN Economic Benefit Assessment

Economic Impacts

Introduction: As part of the evaluation of the multiple benefits to be derived from the identified project recommendations for the study area corridors, we also look at the future economic impact on the Fresno region from implementation of the plan's projects by the various jurisdictions. While the other sections of the report monetize many of quantifiable benefits such as improved safety and air quality, this section discusses the ways project implementation can strengthen the regional transportation system and enhance economic growth.

An economic impact analysis shows how the regional impacts/benefits of the recommended improvements from the Fresno Reverse Triangle Transportation Area Plan help achieve the economic goals in various local and regional plans to increase jobs and improve quality of life for residents within the study area and beyond. The recommended transportation investments for the Reverse Triangle study area are primarily multi-modal solutions focused on safety improvements related to collisions at intersections (lighting, signage, and signalization) and on solutions to increase opportunities for bicycle and pedestrian travel and safety for these users.

An economic impact analysis of the corridors' improvements was conducted and is presented in terms of regional impacts for gross regional product (GRP), jobs, and personal income. To analyze these impacts the economic impacts a model of the economy, called "impact analysis for planning" or IMPLAN was deployed. This model enables one to examine the impact structure of each investment. In the case of construction projects, project expenditures are tracked through the supply chain, from the construction contractor and its employees (direct impacts), to its suppliers and to their employees and onward to further levels of suppliers, employees, and their suppliers (indirect impacts). It also enables the examination of the effects from all the associated income to employees and their household purchases (induced impacts).

This report analyzes the economic impacts associated with the recommended investments identified across the plan timeline; however, since project implementation is within the purview of the local agencies, and the timeline for implementation is uncertain, we talk about total impacts over the life of plan implementation instead of a year-by-year impact analysis. The estimated project investments total $368.22 million.

Methodology: To analyze the economic impacts of these investments we utilize a model of the economy, called "impact analysis for planning" or IMPLAN. This model is in a sense a general accounting system of transactions between industries, businesses, and consumers that estimates the range of economic impacts. Using the IMPLAN modelling software we create complete, extremely detailed Social Accounting Matrices and Multiplier Models of the San Joaquin County economy that enables in-depth examination of the impacts of the projects. This model enables us to examine the impact structure of each investment. For example, in the case

of a construction project, we can trace the project expenditures through the supply chain, from the construction contractor and its employees (direct impacts), to its suppliers and to their employees and onward to further levels of suppliers, employees, and their suppliers (indirect impacts). It also enables us to examine the effects from all the associated income to employees and their household purchases (induced impacts). The model thereby allows us to generate an estimate of how the original investment is multiplied through additional activity in the economy.

We note that not all needs in the various projects' supply chains will be able to be filled within Fresno County. For example, a construction company may need specialized equipment that is only available in another county, state or nation. It may also choose to acquire supplies from other areas if more competitive prices are offered elsewhere. The workers themselves may commute from outside the County, representing an import of labor. Spending that occurs outside of the County is a leakage from the system and reduces the local economic impact, so detailed data on business and consumer purchases are sometimes used to adjust the project multipliers in the IMPLAN model. Even with these necessary adjustments, it is important to remember that the underlying model depends on structural relationships developed from data at a particular moment. As firms enter or exit the county's economy, they may change those structures. Similarly, new technologies and changes in resource endowments can transform the local economic structure. Those changes are typically gradual, but during periods of technological or structural change they can contribute to significant differences in estimated multipliers for models created from one year to the next. We assume that all initial project spending occurs within Fresno County and then allow the model to estimate the leakage. In the case of the Fresno region, this leakage is minor and does not significantly impact the conclusions.

In addition to the trade flows of goods and services, the model incorporates estimates of workers who commute from other counties. That allows us to account for out-of-county workers whose household spending is mostly close to their residences rather than in their place of employment. Because supply chains and worker profiles differ across industries, it is important to allocate projects to specific industries. Most of the improvement recommendations in this study are construction related and thus all projects' initial investments are in employment sector 54, construction of new highways/streets. The employment estimates are measured on a job count basis for wage-and-salary workers and for self-proprietors regardless of the number of hours worked and are reported on an annual basis reflecting the number of full-time and part-time jobs generated annually.

Project Impacts: The full range of economic contribution from spending associated with the Reverse Triangle plan's investments, known as the Total Effect, is the sum of the direct, indirect, and induced effects:

• **Direct Effects** are the changes in sales (output), value (value-added), wages (personal income), and jobs (employment) directly supported by the plan's investments.

• I**ndirect Effects** represent the iterative impacts of inter-industry transactions as supplying industries respond to demand from the sector(s) where the initial expenditures occurred. An example of an indirect impact would be sales from a cement company suppling a construction firm directly funded by the projects.

• **Induced Effects** reflect the expenditures made by recipients of wages in the direct and indirect industries. Examples of induced impacts include employees' expenditures on items such as retail purchases, housing, food, education, banking, and insurance.

The direct economic impact on the Fresno County economy of the $368.22 million initial investment in projects are estimated through our model to generate about 1,668 direct jobs and $115.5 million in direct labor income over the planning horizon. When considering indirect and induced impacts, the initial investment supports 2,760 job years for full-time equivalent jobs, over $173 million in labor income and close nearly $308 million of value added gross regional product, for a total economic effect of over half a billion dollars (total multiplier effect of 1.57). The impact details are shown in the following table.

Economic Impact Summary				
Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	1,668.7	$115,508,985	$198,840,968	$368,224,632
Indirect Effect	419.5	26,016,715	48,200,680	104,983,596
Induced Effect	671.6	32,104,077	60,768,633	103,871,480
Total Effect	***2,759.8***	***$173,629,777***	***$307,810.281***	***$577,079,709***

While the main beneficiaries of increased job opportunities will be construction workers, some job increases due to increased spending by construction workers will include restaurants, real estate firms, hospitals, truck transportation, wholesale goods, and auto repair firms.

Finally, as it enhances accessibility, these investments would benefit both the project area and the County's overall quality of life. Recent studies of these long-term impacts in Southern California suggest that the competitive impacts could be more than double the project construction and operation impacts alone.

We recognize that these transportation investments are more significant than just their project-level associated impacts, as these infrastructure investments may also enhance the corridors' and region's economic competitiveness. These are long-term benefits that will endure beyond the projects' life. The many long-term benefits from this sort of investment are, among others:

- Reduced travel times because of investments alleviating congestion,
- Expanded labor markets across the County, and the region so that labor may move more efficiently through a variety of transit modes,

- Enhanced competitiveness and efficiency of the County's goods movement system.

Therefore, despite the value and importance of the projects' immediate impacts, focusing on those alone omits potential effects from enhancing the region's attractiveness as a business location, including viability for corporate headquarters and growing high-wage job opportunities because of increased connectivity. Benefits may also include supporting the region's travel and tourism industry. In the case of Fresno County large employers and job centers are primarily in the agricultural and manufacturing sectors, with wider regional employment in finance, health care, and education. With the former, facilitation of goods movement and potential conflicts/congestion attributable to a mix of truck, car, and non-motorized travel would be important to access – while the latter would suggest alleviating commute traffic and providing alternatives to solo car travel would be paramount. The smaller, specific study area covered by this planning effort, has a mix of large and small employers across a wide variety of industries; however, it is more recently dominated by larger national warehousing/logistics operations. Thus, goods movement facilitation and lessening potential for conflicts between modes of travel are of similar importance in the study area as in the wider county.

This more detailed analysis of the economic benefit of network and operational improvements in the corridor are beyond the scope of this study. However, we include this qualitative discussion of anticipated future benefits as a starting point for future, more detailed analyses using economic multipliers and secondary data for jobs and output by employment sector, transportation reliance factors, and calculated employment capacity. It is anticipated that this data may be developed for potential future funding opportunities or specific project level analysis. Application and discussion of these economic multipliers will be essential to expand the discussion beyond the benefits of the initial investment in infrastructure that we present here.

Appendix F:
Preliminary Cost Estimates

Corridor / Segment		ID	Segment Length (mi)	# Lanes (Planned)	Proposed Cross-section (ID / Description)		Preliminary Cost Estimates (12 Corridors, 43 miles)	50% Contingency (Applied to preliminary cost estimates)	45% Support Costs (includes PA&ED, PS&E, Construction Support)	TOTAL (12 Corridors, 43 miles)
East-West Roadways										
Church Ave										
Elm Ave to Cherry Ave	Church Ave	1	0.5	4	C2	Buffered Bike Lanes, no Parking (4 Lanes)	$2,170,300	$1,085,150	$1,464,900	**$4,720,000**
Cherry Ave to GSB	Church Ave	2	0.3	4	C2	Buffered Bike Lanes, no Parking (4 Lanes)	$552,500	$276,250	$373,000	**$1,200,000**
Jensen Ave										
Elm Ave to Cherry Ave	Jensen Ave	3	0.5	4	C2	Buffered Bike Lanes, no Parking (4 Lanes)	$506,900	$253,450	$342,200	**$1,100,000**
Cherry Ave to East Ave	Jensen Ave	4	0.3	4	C2	Buffered Bike Lanes, no Parking (4 Lanes)	$310,500	$155,250	$209,700	**$680,000**
East Ave to GSB	Jensen Ave	5	0.4	4	C2	Buffered Bike Lanes, no Parking (4 Lanes)	$363,300	$181,650	$245,200	**$790,000**
North Ave										
Elm Ave to SR 99	North Ave	6.1	0.25	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$1,218,000	$609,000	$822,200	**$2,650,000**
SR 99 to Cherry Ave	North Ave	6.2	0.25	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$796,100	$398,050	$537,300	**$1,730,000**
Cherry Ave to East Ave	North Ave	7	0.5	4	D2	Class IV Bikeway, no Parking (4 Lanes)	$1,658,100	$829,050	$1,119,200	**$3,610,000**
East Ave to Orange Ave	North Ave	8	0.5	4	D2	Class IV Bikeway, no Parking (4 Lanes)	$1,668,700	$834,350	$1,126,400	**$3,630,000**
Orange Ave to Cedar Ave	North Ave	9	0.5	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$2,346,400	$1,173,200	$1,583,800	**$5,100,000**
Cedar Ave to GSB	North Ave	10	0.25	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$1,209,000	$604,500	$816,100	**$2,630,000**
Central Ave										
Elm Ave to Cherry Ave	Central Ave	11	0.5	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$2,679,800	$1,339,900	$1,808,900	**$5,830,000**
Cherry Ave to Mary Ave	Central Ave	12	0.25	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$1,611,800	$805,900	$1,088,000	**$3,510,000**
Mary Ave to East Ave	Central Ave	13	0.25	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$775,000	$387,500	$523,200	**$1,690,000**
East Ave to Amazon Dwy	Central Ave	14	0.4	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$2,494,200	$1,247,100	$1,683,600	**$5,420,000**
Amazon Dwy to Orange Ave	Central Ave	15.1	0.1	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$338,300	$169,150	$228,300	**$740,000**
Orange Ave to Maple Ave	Central Ave	15.2	1	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$5,828,900	$2,914,450	$3,934,500	**$12,680,000**
Maple Ave to GSB	Central Ave	16	0.6	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$3,494,800	$1,747,400	$2,358,900	**$7,600,000**
American Ave										
Elm Ave to Orange Ave	American Ave	17	1.5	2	F	Industrial Roadway with Buffered Bike Lanes	$3,319,400	$1,659,700	$2,240,600	**$7,220,000**
Orange Ave to Maple Ave	American Ave	18	1	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$6,295,700	$3,147,850	$4,249,600	**$13,690,000**
Maple Ave to GSB	American Ave	19	1.5	2	F	Industrial Roadway with Buffered Bike Lanes	$3,319,400	$1,659,700	$2,240,600	**$7,220,000**
Lincoln Ave										
Elm Ave to Sarah St	Lincoln Ave	20	0.7	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$4,499,200	$2,249,600	$3,037,000	**$9,790,000**
Sarah Str to Chestnut Ave	Lincoln Ave	21	2.3	2	F	Industrial Roadway with Buffered Bike Lanes	$5,396,400	$2,698,200	$3,642,600	**$11,740,000**
Adams Ave										
Elm Ave to GSB	Adams Ave	22	5.8	2	F	Industrial Roadway with Buffered Bike Lanes	$12,834,900	$6,417,450	$8,663,600	**$27,920,000**

GSB = Golden State Blvd

Corridor / Segment			Segment Length (mi)	# Lanes (Planned)	Proposed Cross-section (ID / Description)		TOTAL Cost
North-South Roadways							
Cherry Ave							
Church Ave to Jensen Ave	Cherry Ave	23	0.5	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$2,279,700	$1,139,850	$1,538,800	**$4,960,000**
Jensen Ave to Annadale Ave	Cherry Ave	24	0.5	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$2,297,500	$1,148,750	$1,550,800	**$5,000,000**
Annadale Ave to North Ave	Cherry Ave	25	0.5	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$501,200	$250,600	$338,400	**$1,090,000**
North Ave to Valley Iron Inc.	Cherry Ave	26	0.25	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$1,175,700	$587,850	$793,600	**$2,560,000**
Valley Iron Inc. to Central Ave	Cherry Ave	27	0.75	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$4,730,200	$2,365,100	$3,192,900	**$10,290,000**
Central Ave to Adams Ave	Cherry Ave	28	3	2	D1	Class IV Bikeway, no Parking (2 Lanes)	$19,237,600	$9,618,800	$12,985,400	**$41,840,000**
East Ave										
Jensen Ave to North Ave	East Ave	29	1.1	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$5,169,100	$2,584,550	$3,489,100	**$11,240,000**
North Ave to Central Ave	East Ave	30	1	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$4,449,700	$2,224,850	$3,003,600	**$9,680,000**
Central Ave to Adams Ave	East Ave	31	3	2	F	Industrial Roadway with Buffered Bike Lanes	$7,038,800	$3,519,400	$4,751,100	**$15,310,000**
Orange Ave										
GSB to SR 99	Orange Ave	32	0.4	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$1,985,900	$992,950	$1,340,500	**$4,320,000**
SR 99 to North Ave	Orange Ave	33	0.25	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$1,138,000	$569,000	$768,200	**$2,480,000**
North Ave to Fortune Ave	Orange Ave	34	0.25	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$796,100	$398,050	$537,300	**$1,730,000**
Fortune Ave to Central Ave	Orange Ave	35	0.75	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$2,264,300	$1,132,150	$1,528,400	**$4,920,000**
Central Ave to American Ave	Orange Ave	36	1	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$6,429,100	$3,214,550	$4,339,600	**$13,980,000**
American Ave to Adams Ave	Orange Ave	37	2	2	F	Industrial Roadway with Buffered Bike Lanes	$4,692,600	$2,346,300	$3,167,500	**$10,210,000**
Cedar Ave										
GSB to American Ave	Cedar Ave	38	2.25	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$14,151,900	$7,075,950	$9,552,600	**$30,780,000**
American Ave to Adams Ave	Cedar Ave	39	2	2	C1	Buffered Bike Lanes, no Parking (2 Lanes)	$12,578,400	$6,289,200	$8,490,400	**$27,360,000**
Chestnut Ave										
Central Ave to Adams Ave	Chestnut Ave	40	3	2	F	Industrial Roadway with Buffered Bike Lanes	$3,437,900	$1,718,950	$2,320,600	**$7,480,000**

GSB = Golden State Blvd

	Preliminary Cost Estimates (12 Corridors, 43 miles)	50% Contingency (Applied to preliminary cost estimates)	45% Support Costs (includes PA&ED, PS&E, Construction Support)	TOTAL (12 Corridors, 43 miles)
TOTAL	$160,041,300	$80,020,650	$108,028,200	**$348,120,000**

Intersection (grouped by east-west corridor)	Multimodal/Safety Improvement Category	Multimodal/Safety Improvement Description	Preliminary Cost Estimates (75 Intersections)	50% Contingency (Applied to preliminary cost estimates)	45% Support Costs (includes PA&ED, PS&E, Construction Support)	TOTAL (75 Intersections)
Church Avenue				**50%**	**45%**	
Church Avenue / Elm Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
Church Avenue / Cherry Avenue	A - NS	Comprehensive Multimodal/Safety Improvements - Unsignalized Intersection	$247,500	$123,750	$111,375	**$482,625**
Jensen Avenue						
Jensen Avenue / Elm Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
Jensen Avenue / SR 41 SB Ramp	B - S	Multimodal/Safety Improvements - Signalized Intersection	$240,000	$120,000	$108,000	**$468,000**
Jensen Avenue / SR 41 NB Ramp	B - S	Multimodal/Safety Improvements - Signalized Intersection	$240,000	$120,000	$108,000	**$468,000**
Jensen Avenue / Cherry Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
Jensen Avenue / East Avenue (SR 99)	B - S	Multimodal/Safety Improvements - Signalized Intersection	$360,000	$180,000	$162,000	**$702,000**
Elm Avenue						
Elm Avenue / Annadale Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$315,000	$157,500	$141,750	**$614,250**
North Avenue						
North Avenue / Elm Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$480,000	$240,000	$216,000	**$936,000**
North Avenue / SR 41 SB Ramp	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$415,000	$207,500	$186,750	**$809,250**
North Avenue / SR 41 NB Ramp	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$415,000	$207,500	$186,750	**$809,250**
North Avenue / Cherry Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
North Avenue / East Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
North Avenue / Orange Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
North Avenue / Cedar Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
Central Avenue						
Central Avenue / Elm Avenue	A - NS	Comprehensive Multimodal/Safety Improvements - Unsignalized Intersection	$215,000	$107,500	$96,750	**$419,250**
Central Avenue / SR 41	B - S	Multimodal/Safety Improvements - Signalized Intersection	$340,000	$170,000	$153,000	**$663,000**
Central Avenue / Cherry Avenue	A - NS	Comprehensive Multimodal/Safety Improvements - Unsignalized Intersection	$280,000	$140,000	$126,000	**$546,000**
Central Avenue / East Avenue	A - NS	Comprehensive Multimodal/Safety Improvements - Unsignalized Intersection	$280,000	$140,000	$126,000	**$546,000**
Central Avenue / Orange Avenue	B - S	Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
Central Avenue / Cedar Avenue	B - NS	Multimodal/Safety Improvements - Unsignalized Intersection	$250,000	$125,000	$112,500	**$487,500**
Central Avenue / Maple Avenue	B - NS	Multimodal/Safety Improvements - Unsignalized Intersection	$250,000	$125,000	$112,500	**$487,500**
Central Avenue / Chestnut Avenue	B - S	Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
American Avenue						
American Avenue / Elm Avenue	B - NS	Multimodal/Safety Improvements - Unsignalized Intersection	$190,000	$95,000	$85,500	**$370,500**
American Avenue / SR 41	B - S	Multimodal/Safety Improvements - Signalized Intersection	$340,000	$170,000	$153,000	**$663,000**
American Avenue / Cherry Avenue	A - NS	Comprehensive Multimodal/Safety Improvements - Unsignalized Intersection	$280,000	$140,000	$126,000	**$546,000**
American Avenue / East Avenue	C	Priority Industrial Street Bicycle/Safety Improvements - Unsignalized Intersection	$160,000	$80,000	$72,000	**$312,000**
American Avenue / Orange Avenue	B - NS	Multimodal/Safety Improvements - Unsignalized Intersection	$250,000	$125,000	$112,500	**$487,500**
American Avenue / Cedar Avenue	A - NS	Comprehensive Multimodal/Safety Improvements - Unsignalized Intersection	$280,000	$140,000	$126,000	**$546,000**
American Avenue / Maple Avenue	A - NS	Comprehensive Multimodal/Safety Improvements - Unsignalized Intersection	$280,000	$140,000	$126,000	**$546,000**
American Avenue / Chestnut Avenue	C	Priority Industrial Street Bicycle/Safety Improvements - Unsignalized Intersection	$160,000	$80,000	$72,000	**$312,000**
Jefferson Avenue						
Jefferson Avenue / Elm Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Jefferson Avenue / Cherry Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Jefferson Avenue / East Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Jefferson Avenue / Orange Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Jefferson Avenue / Cedar Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Jefferson Avenue / Chestnut Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Lincoln Avenue						
Lincoln Avenue / Elm Avenue	A - S	Comprehensive Multimodal/Safety Improvements - Signalized Intersection	$380,000	$190,000	$171,000	**$741,000**
Lincoln Avenue / Cherry Avenue	A - NS	Comprehensive Multimodal/Safety Improvements - Unsignalized Intersection	$280,000	$140,000	$126,000	**$546,000**
Lincoln Avenue / East Avenue	C	Priority Industrial Street Bicycle/Safety Improvements - Unsignalized Intersection	$160,000	$80,000	$72,000	**$312,000**
Lincoln Avenue / Orange Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$60,000	$30,000	$27,000	**$117,000**
Lincoln Avenue / Cedar Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$60,000	$30,000	$27,000	**$117,000**
Lincoln Avenue / Maple Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$60,000	$30,000	$27,000	**$117,000**
Lincoln Avenue / Chestnut Avenue	C	Priority Industrial Street Bicycle/Safety Improvements - Unsignalized Intersection	$160,000	$80,000	$72,000	**$312,000**
Clayton Avenue						
Clayton Avenue / Elm Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Clayton Avenue / Cherry Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Clayton Avenue / East Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Clayton Avenue / Orange Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Clayton Avenue / Cedar Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Clayton Avenue / Chestnut Avenue	C	Priority Industrial Street Bicycle/Safety Improvements - Unsignalized Intersection	$160,000	$80,000	$72,000	**$312,000**
Adams Avenue						
Adams Avenue / Elm Avenue	B - NS	Multimodal/Safety Improvements - Unsignalized Intersection	$250,000	$125,000	$112,500	**$487,500**
Adams Avenue / SR 41	B - S	Multimodal/Safety Improvements - Signalized Intersection	$340,000	$170,000	$153,000	**$663,000**
Adams Avenue / Cherry Avenue	A - NS	Comprehensive Multimodal/Safety Improvements - Unsignalized Intersection	$280,000	$140,000	$126,000	**$546,000**
Adams Avenue / East Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$47,500	$23,750	$21,375	**$92,625**
Adams Avenue / Orange Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$47,500	$23,750	$21,375	**$92,625**
Adams Avenue / Cedar Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$47,500	$23,750	$21,375	**$92,625**
Adams Avenue / Maple Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Adams Avenue / Chestnut Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$47,500	$23,750	$21,375	**$92,625**
Adams Avenue / Minnewawa Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
Adams Avenue / Clovis Avenue	D	Industrial Street Safety Improvements - Unsignalized Intersection	$35,000	$17,500	$15,750	**$68,250**
SR 99 Ramp Improvements						
Jensen Avenue/SR 99 SB Off-Ramp (East Avenue)	n/a	Major Signal Modifications	$250,000	$125,000	$112,500	**$487,500**
North Avenue/SR 99 SB Off-Ramp (Parkway Drive)	n/a	**Future Caltrans funded improvement*				**n/a**
Chestnut Avenue/SR 99 NB Off-Ramp	n/a	New Traffic Signal	$400,000	$200,000	$180,000	**$780,000**
Clovis Avenue/SR 99 NB Off-Ramp	n/a	New Traffic Signal	$400,000	$200,000	$180,000	**$780,000**
Clovis Avenue/SR 99 SB On-Ramp	n/a	New Traffic Signal	$400,000	$200,000	$180,000	**$780,000**

Note 1: Operational improvements for SR 41 and SR 99 intersections are described in a preceeding section of this chapter.

Note 2: This list does not include multimodal improvements for SR 99 ramp intersections.

Note 3: Interesction improvement costs are adjusted on a case-by-case basis to account for locations with existing infrastructure at certain approaches.

	Preliminary Cost Estimates (75 Intersections)	50% Contingency (Applied to preliminary cost estimates)	45% Support Costs (includes PA&ED, PS&E, Construction Support)	TOTAL (75 Intersections)
TOTAL	$14,007,500	$7,003,750	$6,303,375	**$27,314,625**

Appendix G: Funding Opportunities Memorandum

7. Overview of Funding Opportunities

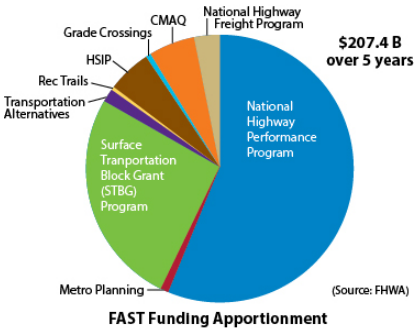
Funding opportunities for infrastructure projects are generally categorized into grants and loans available from the federal, State, or local agency (county or city) level of government, from fees or assessments in a particular district or jurisdiction, and private funding organizations. Government funding 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. This type of spending was prohibited a decade ago, but has come back in 2021 as both parties have again recognized the value in identifying projects in legislative districts.

The recent environment in Washington, D.C. has been 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. A new authorization bill is currently being developed and considered in Congress. 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.

- **Rebuilding American Infrastructure with Sustainability and Equity (RAISE)**. The Consolidated Appropriations Act, 2021, appropriated $1 billion to be awarded by the Department of Transportation (DOT) for National Infrastructure Investments (now know as RAISE). Raise grants are for capital investments in surface transportation that will have a significant local or regional impact. DOT will also award $30 million for eligible planning, preparation or design, of at least $10 million will be awarded to projects located in or to directly benefit areas of persistent poverty.

U.S. Department of Transportation **Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grants**	
Description	Funds for the FY 2021 RAISE grant program are to be awarded on a competitive basis for surface transportation infrastructure projects that will have a significant local or regional impact. This program was formerly known as BUILD Transportation Grants
Deadline	July 12, 2021
Eligible Applicants	• State governments • local governments • Tribal governments • U.S. territories' governments • transit agencies • port authorities • metropolitan planning organizations (MPOs) • other political subdivisions of State or local governments
Project Type Eligibility	Projects for RAISE funding will be evaluated based on merit criteria that include safety, environmental sustainability, quality of life, economic competitiveness, state of good repair, innovation, and partnership. Within these criteria, the Department will prioritize projects that can demonstrate improvements to racial equity, reduce impacts of climate change and create good-paying jobs.

Funding Information	• **Estimated Total Program Funding:** $1 billion
	• **Award Maximum:** $25 million
	• **Award Minimum:**
	  ○ None for planning projects
	  ○ $1 million for capital projects in rural areas
	  ○ $5 million for capital projects in urban areas
	• No more than $100 million can be awarded to a single state
	• Up to $30 million will be awarded to planning grants, including at least $10 million to Areas of Persistent Poverty.
	• Department will award an equitable amount, not to exceed half of funding, to projects located in urban and rural areas respectively.

Match Requirement	20% match required
Website	https://www.transportation.gov/sites/dot.gov/files/2021-04/FY%202021%20RAISE%20grants%20NOFO%20%28Final%29.pdf

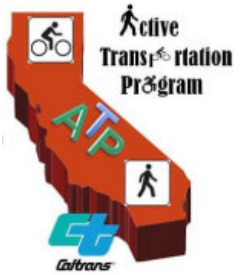
- **Other Categories.** Congress and the Executive Branch also make funding available for other priorities and for targeted priorities within the categories already mentioned. As an example, several years ago, the American Recovery and Reinvestment Act was approved, which provided funding in a variety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

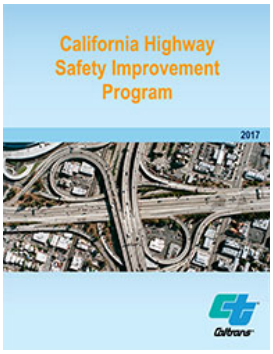
  Particularly relevant to the Fresno Council of Governments is the Active Transportation Program (ATP), which was established following the consolidation of several funding activities at the federal level. In 2013, the Legislature passed and the Governor signed two pieces of legislation establishing the 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

Fresno Council of Governments

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.

- **Transportation Impact Fees**.

  The City of Fresno (City) adopted the Fresno Major Street Impact Fee Program Nexus Study and established the Citywide Regional Street Impact Fee Program and the New Growth Area Major Street Impact Fee Program, collectively referred to as the Fresno Major Street Impact Fee Program (FMSI Fee Program). The FMSI Fee Program was implemented to provide a funding mechanism for transportation facilities required to serve future development through 2025. The FMSI Fee Program is a successor fee program that replaced the previous transportation facility components of the City's Urban Growth Management (UGM) fee program. In December 2014, the City adopted a new General Plan that establishes growth projections through the General Plan Horizon year of 2035 as well as through buildout of the General Plan. The General Plan includes goals, objectives, and implementing policies for the transportation system. A General Plan traffic model was prepared that was consistent with the goals, objectives, and policies of the General Plan. In accordance with the identified transportation needs based on traffic volume growth forecasts generated by the traffic model, the City's Public Works Department subsequently provided an FMSI Fee Program Capital Improvement Program (Street CIP) that outlines the planned facilities and costs for FMSI Fee Program funded transportation improvements through General Plan buildout.

  Similarly, Fresno County adopted the Regional Transportation Mitigation Fee (RTMF). The RTMF was created to fulfill one of the terms of the Measure 'C' Extension ballot measure,

which was approved by Fresno County voters in 2006. The RTMF became effective on January 1, 2010. The Mitigation Fee Act requires that impact fees be periodically reviewed and updated to ensure that the project list, estimated project costs, land use forecasts, and other key inputs are kept up-to-date.

Fresno County also has a Public Facilities Impact Fee to support future projected development within Fresno County. The County imposes public facilities impact fees on new development to fund future development's share of these facilities and improvements. However, transportation impact fees are not included in the Public Facilities Impact Fee; the fees that are categorized as follows:

- Countywide Public Protection
- General Government Facilities
- Library
- Health and Human Services
- Sheriff's Patrol and Investigation
- County Parks and Open Space

- **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.

OVERVIEW OF FUNDING OPPORTUNITIES						
Source	**Legislation/Measure Appropriating Funds (If Applicable)**	**Policy Area(s)**	**Administering Agency**	**Program Name(s)**	**Available Annual Funding**	**Description**
Federal-distributed by State	FAST Act	Transportation	Department of Transportation sub-allocated to Caltrans	Surface Transportation Block Grant Programs	$4.97 billion (total) in 2020-state share expected to be flat	Provides flexible funding that localities may use for projects to preserve and improve conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.
Federal	Appropriations Act	Transportation	Department of Transportation	Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	$1 billion	Projects for RAISE funding will be evaluated based on merit criteria that include safety, environmental sustainability, quality of life, economic competitiveness, state of good repair, innovation, and partnership. Within these criteria, the Department will prioritize projects that can demonstrate improvements to racial equity, reduce impacts

						of climate change and create good-paying jobs.
Federal & State Funding-allocated as a State program	FAST Act & SB 1	Transportation	Department of Transportation sub-allocated to Caltrans	Active Transportation Program (Funded in part by the FAST Act and SB 1)	Expected to include about $440 million	To increase the proportion of trips accomplished by walking and biking, increasing the safety and mobility of non-motorized users, advancing efforts of regional agencies to achieve greenhouse gas reduction goals, enhancing public health, and providing a broad spectrum of projects to benefit many types of users including disadvantaged communities.
Federal-distributed by State	FAST Act	Transportation	Department of Transportation-sub-allocated to Caltrans	Highway Safety Improvement Program	TBD—maximum individual award is $10 million	The purpose of the HSIP 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.
Federal-distributed by State	FAST Act	Transportation	Department of Transportation-sub-allocated to Caltrans	Congestion Mitigation and Air Quality Program	TBD	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.
Federal	N/A	Housing and Community Development	Department of Housing and Urban Development	Community Development Block Grant Program	TBD	The program provides funding for housing activities, community facilities, public service projects that serve lower-income people, and planning and evaluation studies related to eligible activities.
Federal	N/A	Housing and Community Development	Department of Housing and Urban Development	HOME Investment Partnership Program	States receive funds either by formula or $3 million, whichever is greater	To fund a wide range of activities including building, buying, and/or rehabilitating affordable housing for rent or homeownership or providing direct rental assistance to low-income people
State	SB 1	Transportation	CTC/Caltrans	Adaptation Planning Grants	Approximately $6 million per round	Provides funding to local and regional agencies for adaptation planning on California's transportation infrastructure, including but not limited to: roads, railways, bikeways, trails, bridges, ports, and airports. Eligible projects must have a transportation nexus.
State	SB 1	Transportation	CTC/Caltrans	Local Partnership Program (Competitive)	$100 million	Provides Funding to regional agencies to improve aging infrastructure, road

						conditions, active transportation, and health and safety benefits.
State	SB 1	Transportation	CTC/Caltrans	Solutions for Congested Corridors Program	$250 million	For projects designed to achieve a balanced set of transportation, environmental, and community access improvements within highly congested travel corridors throughout the state.
State	SB 1	Transportation	CTC/Caltrans	State Transportation Improvement Program (General)	TBD. Approximately $407 million for 2020-25	Allocations of certain state transportation funds for state highway improvements, intercity rail, and regional highway and transit improvements.
State	SB 1	Transportation	CTC/Caltrans	Trade Corridor Enhancement Program	Approximately $300 million	Funding for infrastructure improvements on federally designated Trade Corridors of National and Regional Significance, on the Primary Freight Network as identified in California Freight Mobility Plan, and along other corridors that have a high volume of freight movement.
State	N/A	Transportation (with emphasis on environment)	California Natural Resources Agency	Environmental Enhancement and Mitigation Program	Up to $7 million	For projects that contribute to mitigation of the environmental

						effects of transportation facilities.
State	N/A	Transportation (with emphasis on environment)	California Department of Parks and Recreation	Recreational Trails Program	Approximately $1.7 million	Supports the construction od new trails, trail expansions, trail renovations, and trail amenities.
State	Primarily SB 1	Transportation	CTC/Caltrans	Sustainable Transportation Planning Grant Program (has subsets of grants)	$29.5 million	Funds used to strengthen economies, promote equity, and protect the environment—while fostering the programming and implementation of transportation improvement projects.
State	SB 1	Transportation	CTC/Caltrans	Local Streets and Roads Program	TBD	Road maintenance and repair, to pre-construction efforts, and additional public works operational needs.
State	Prop 1C	Housing and Community Development	California HCD	Infill Infrastructure Grant Program	Approximately $194 million for Large Jurisdictions and $85 million for Small Jurisdictions	Supports infrastructure improvements to facilitate new infill housing development. IIG serves to aid in new construction and rehabilitation of infrastructure that supports higher-density affordable and mixed-income housing in locations designated as infill.
State	N/A	Housing and Community Development	California HCD	Affordable Housing and Sustainable	Approximately $550 million	To reduce greenhouse gas (GHG) emissions through projects

				Communities Grant Program		implementing land-use, housing, transportation, and agricultural land preservation practices to support infill and compact development, and support related and coordinated public policy objectives.
State	N/A	Housing and Community Development	California HCD	Joe Serna Jr., Farmworker Housing Grant Program	N/A	Finance the new construction, rehabilitation, and acquisition of owner-occupied and rental units for agricultural workers, with a priority for lower income households.
State	Cap and Trade Funds	Sustainability and Strategic Planning.	California Strategic Growth Council	Transformative Climate Communities	TBD. Approximately $56 million available	Funds community-led development and infrastructure projects that achieve major environmental, health, and economic benefits in California's most disadvantaged communities.
State	N/A	Recycled Materials	CalRecycle	Farm and ranch Solid Waste Cleanup and Abatement Grant Program	$1 million	Cleanup of illegal solid waste sites on farm or ranch property- where needed to abate a nuisance or public health and safety threat and/or a threat to the environment.
State	N/A	Other Infrastructure	Governor's Office of Business and Economic	Infrastructure State Revolving	N/A. Loans between $50,000 and $25 million	Financing to public agencies and non-profit corporations, sponsored

			Development-through California Infrastructure and Economic Development Bank (I-Bank)	Fund (ISRF) Program		by public agencies, for a wide variety of infrastructure and economic development projects (excluding housing).
Private	N/A	Parks and Recreation	America Walks	Community Change Grants	TBD	This grant program supports local efforts to create safe, accessible, and enjoyable places to walk and be physically active for all community members.
Private	N/A	Parks and Recreation	U.S. Soccer Foundation	Program Grants	TBD	Through this grant opportunity, the U.S. Soccer Foundation will emphasize impactful strategies to increase female participation in soccer. Competitive proposals will include a dynamic program focused on improving recruitment and retention, creating an inclusive environment, and building on the benefits of soccer programming, such as increased confidence, leadership skills, and self-esteem.

LOCAL SUMMARY			
Agency or Program	**Name**	**Policy Area(s)**	**Description**
Agency	Fresno Council of Governments (FCOG)	Primarily Transportation planning and programming	FCOG is the federally-designated Metropolitan Planning Organization for Fresno County and a state-designated Regional Transportation Planning Agency. Also administers the voter-approved Measure C local sales tax (expected to raise $1.2 billion through 2027) for transportation projects.
Agency	County of Fresno	Primarily Transportation projects	Plays 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.
Program as means of Funding	Assessment District	General Infrastructure/Improvements (Often Transportation oriented)	Created to finance improvements when other sources are limited-often formed in underdeveloped or unincorporated areas and used to build/maintain roads and water sewer systems.
Program as means of Funding	Enhanced Infrastructure Financing District	General Infrastructure/Improvements	Established by SB 628 to allow a city, county, special district (or combination of the three) to create a new governmental entity that funds the construction, improvement, or rehabilitation of a defined area.

Appendix H: Glossary of Terms

Glossary of common acronyms and definitions from
The Fresno Council of Governments (FCOG)
2018 Regional Transportation Plan and Sustainable Communities Strategy

Glossary *of common acronyms and definitions*

ACRONYM	TERM	DEFINITION
AASHTO	American Association of State Highway and Transportation Officials	AASHTO is a nonprofit, nonpartisan association representing highway and transportation departments in the 50 states, the District of Columbia, and Puerto Rico. Its primary goal is to foster the development, operation, and maintenance of an integrated national transportation system.
AB 120	Assembly Bill 120	AB 120 required that social transportation services be consolidated and established Consolidated Transportation Service Agencies.
AB 2419	Assembly Bill 2419	AB 2419 (1996) allowed local agencies to collectively opt out of congestion management programs.
AB 32	Assembly Bill 32	Signed into law on September 26, 2006, it requires that the state's global warming emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on global warming emissions that will be phased in starting in 2012. In order to effectively implement the cap, AB 32 directs the California Air Resources Board (CARB) to develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels.
ABM	Activity Based Model	Activity-based models are based on the principle that travel demand is derived from people's daily activity patterns. Activity-based models predict which activities are conducted when, where, for how long, for and with whom, and the travel choices they will make to complete them.
Active Transportation		A mode of transportation that includes walking, running, biking, skateboarding, and other self-propelled forms of transportation
ADA	Americans with Disabilities Act of 1990	Guarantees equal opportunity for individuals with disabilities in public accommodations, employment, transportation, state and local government services, and telecommunications. It prescribes federal transportation requirements for transportation providers.
ADT	Average Daily Traffic	Total daily volume of vehicle traffic of a highway or road
AHSC	Affordable Housing and Sustainable Communities	Administered by the Strategic Growth Council and implemented by the Department of Housing and Community Development (HCD), the AHSC Program funds land-use, housing, transportation, and land preservation projects to support infill and compact development that reduce greenhouse gas ("GHG") emissions. Funding for the AHSC Program is provided from the Greenhouse Gas Reduction Fund (GGRF), an account established to receive Cap-and-Trade auction proceeds.
AIA	Airport Influence Area	The area around an airport that includes the overflight, noise and safety zones that the Airport Land Use Commission uses to determine compatibility of land uses surrounding the airport.
AIP	Airport Improvement Program	The Airport Improvement Program (AIP) provides grants to public agencies — and, in some cases, to private owners and entities — for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS).
AITS	Agricultural Industries Transportation Services	The AITS Needs Assessment Project, under the management of e21 corp, embarked on a statewide assessment and analysis of the unmet transportation needs of agricultural workers in major growing regions throughout California. The contract with e21 corp also called for the evaluation the existing AITS Transportation Pilot Project in the Central Valley Counties of Kings, Tulare, Fresno, and Kern.
ALP	Airport Layout Plan	A graphic representation of the current conditions and the future long-term planned development for an airport that airports must keep up to date in order to receive federal assistance.

ACRONYM	TERM	DEFINITION
ALUC	Airport Land Use Commission	The Commission assists local agencies in ensuring orderly development around airports and discouraging incompatible land uses, including limiting the public's exposure to excessive noise and health and safety hazards.
ALUCPP	Airport Land Use Compatibility Policy Plan	Required by the State Aeronautics Act for all public use airports. Also known as a CLUP - Compatilibiltiy Land Use Plan - a policy planning tool that details the safety and noise compatibility criteria for development around airports, and is developed and used by Airport Land Use Commissions to conduct reviews to determine compatiblity of proposed land uses on and around airports.
AMP	Airport Master Plan	An Airport Master Plan is a study used to determine the long-term development plans for an airport. Because air transportation is a vital community industry, it is important that the requirements for new or improved airports be anticipated.
AMTRAK	National Railroad Passenger Corporation	Publicly funded railroad service operated and managed as a for-profit corporation.
APCD	Air Pollution Control District	The Fresno area is under the auspices of the San Joaquin Valley Air Pollution Control District (SJVAPCD) which works with state and federal air quality agencies to attain health air in the San Joaquin Valley Air Basin.
ARB	Air Resources Board (also referred to as CARB, California Air Resources Board)	This is the state level air quality agency which works with local and federal air quality agencies to attain healthier air in California.
ATCT	Airport Traffic Control Tower	The primary method of controlling the immediate airport environment is visual observation from the airport control tower. The tower is a tall, windowed structure located on the airport grounds. Air traffic controllers are responsible for the separation and efficient movement of aircraft and vehicles operating on the taxiways and runways of the airport itself, and aircraft in the air near the airport, generally 5 to 10 nautical miles (9 to 18 km) depending on the airport procedures.
ATP	Active Transportation Plan	A plan that identifies strategies and facilities to encourage people to travel by active transportation, such as walking and biking.
Authority	California High-Speed Rail Authority	The California High-Speed Rail Authority (Authority) is responsible for planning, designing, building and operation of the first high-speed rail system in the nation.
AVA	Abandoned Vehicle Abatement	A means to remove abandoned vehicles that create a public nuisance and a health or safety hazard.
AVCRAD	Aviation Classification Repair Activity Depot	An AVCRAD performs two combat service support (CSS) functions executed at the depot level: maintenance and supply. It is responsible for limited depot aircraft maintenance, component repair, pass-back aviation intermediate maintenance (AVIM), and operation of a supply support activity (SSA).
Base Year		The year 2008, used in the RTP performance analysis as a reference point for current conditions.
BNSF		Burlington Northern and Santa Fe Railway Company
BRT	Bus Rapid Transit	Bus transit service that seeks to reduce travel time through measures such as traffic signal priority, automatic vehicle location, dedicated bus lanes, limited stop service, and faster fare collection policies.
BTA	Bicycle Transportation Account	Annual program providing state funds for city and county projects that improve safety and convenience for bicycle commuters.
CAA	Clean Air Act (Federal)	The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources.
CAAP	California Aid to Airports Program	Provides grants to public agencies — and, in some cases, to private owners and entities -- for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems.
CALCOG	California Association of Councils of Government	Association made up of the 35 Metropolitan Planning Organizations and Regional Transportation Planning Agencies in California.

ACRONYM	TERM	DEFINITION
Caltrans	California Department of Transportation	State of California government agency whose mission is to maintain, repair and improve roads and highways throughout the State.
Caltrans Headquarters	Caltrans Headquarters	Sacramento division of Caltrans that oversees state activities and Local Assistance.
Caltrans Local Assistance	Caltrans Local Assistance	Division of Caltrans that assists local and regional agencies by ensuring specific program requirements are met, project applications are processed, and projects are delivered in accordance with Federal and State requirements.
CalVans	California Vanpool Authority	The California Vanpool Authority (also known as CalVans) is a Joint Powers Authority formed in 2012. The Authority evolved from a vanpool program established by Kings County in 2001. The Authority's vanpool services connect residents in areas with low population density. CalVans currently serves the following California counties: Fresno, Imperial, Kern, Kings, Madera, Merced, Monterey, Riverside, San Benito, Santa Barbara, Santa Cruz, Tulare, and Ventura.
CARB	California Air Resources Board	See definition for ARB on previous page
CANG	California Air National Guard	The California Air National Guard (CANG) is the air force militia of the U.S. State of California. It is, along with the California Army National Guard, an element of the California National Guard.
CASP	California Aviation System Plan	The means by which continuous aviation system planning is conducted by the State.
CCAA	California Clean Air Act	The Clean Air Act (CAA) is the comprehensive state law that regulates air emissions from stationary and mobile sources.
CCR	California Code of Regulations	The official compilation and publication of the regulations adopted, amended or repealed by state agencies pursuant to the Administrative Procedure Act (APA).
CEQA	California Environmental Quality Act	State law providing certain environmental protections that apply to all transportation projects funded with state funds.
CHP	California Highway Patrol	The California Highway Patrol is a law enforcement agency of the state of California. The primary mission of the CHP is to ensure safety and enforce traffic laws on all California highways and county roads in unincorporated areas.
CHSTP	Coordinated Human-Services Transportation Plan	Federal transit law requires that projects selected for funding under the Enhanced Mobility for Individuals and Individuals with Disabilities (Section 5310) Program be "included in a locally developed, coordinated public transit-human services transportation plan," and that the plan be "developed and approved through a process that included participation by seniors, individuals with disabilities, representatives of public, private, and nonprofit transportation and human services providers and other members of the public" utilizing transportation services. These coordinated plans identify the transportation needs of individuals with disabilities, older adults, and people with low incomes, provide strategies for meeting these needs, and prioritize transportation services for funding and implementation.
CIP	Capital Improvement Program	7-year program to maintain or improve traffic Level of Service (LOS) & transit performance and to mitigate impacts identified by the Congestion Manangement Program.
CMAQ	Congestion Mitigation and Air Quality	Federal funding account designated for projects that improve air quality and reduce congestion.
CMP	Congestion Management Program	Established by Proposition 111 in 1990, requires each county to develop and adopt a CMP that includes highway and roadway system monitoring, multimodal system performance analysis, transportation demand management program, land-use analysis program and local conformance.
CNG	Compressed Natural Gas	Is an alternative fuel for use in combustion-can reduce some criteria air pollutants.

ACRONYM	TERM	DEFINITION
CO	Carbon Monoxide	A colorless, odorless, poisonous gas formed when carbon in fuels is not burned completely. It is a byproduct of highway vehicle exhaust, which contributes about 60 percent of all CO emissions nationwide.
COG	Council of Governments	A governmental agency formed by joint powers agreement by all the member governments within a given region. Specific powers vary by agency, but usually involve transportation issues.
Corridor		In planning, a broad geographical band that follows a general directional flow or connects major sources of trips. It may contain a number of streets and highways, as well as transit lines and routes.
CPUC	California Public Utilities Commission	The California Public Utilities Commission is a regulatory agency that regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies, in addition to authorizing video franchises.
CTC	California Transportation Commission	A board appointed by the governor to oversee and administer state and federal transportation funds and provide oversight on project delivery.
CTSA	Consolidated Transportation Service Agency	Designated under auspices of the Social Services Transportation Improvement Act to achieve the intended transportation coordination goals of that Act.
DAC	City of Fresno Disability Advisory Council	The City of Fresno, Disability Advisory Commission (DAC) was created to improve the quality of life for the disabled community in our area. The Commission will increase the public's awareness of the strengths and successes of people with disabilities by actively participating in community activities and events which incorporate diverse perspectives.
	Disadvantaged Community	Disadvantaged communities are defined as the top 25% scoring areas from CalEnviroScreen along with other areas with high amounts of pollution and low populations. Disadvantaged communities in California are specifically targeted for investment of proceeds from the State's cap-and-trade program. These investments are aimed at improving public health, quality of life and economic opportunity in California's most burdened communities at the same time reducing pollution that causes climate change.
EIR	Environmental Impact Report	An informational document, required under CEQA, which will inform public agency decision-makers and the public generally of the significant environmental effects of a project, possible ways to minimize significant effects, and reasonable alternatives to the project.
EIS	Environmental Impact Statement	National Environmental Policy Act (NEPA) requirement for assessing the environmental impacts of federal actions that may have a significant impact on the human environment.
EJ	Environmental Justice	Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.
EPA	Environmental Protection Agency (Federal)	This is the federal level agency which works with local and state air quality agencies to protect the environment to provide healthy living conditions and welfare for the nation.
EPSP	Expedited Project Selection Procedures	Process used to design and construct a project prior to the programmed year shown in the FTIP by moving the funds forward to the current year.
eTRIP	Employer Based Trip Reduction	An employer-based trip reduction program that use various approaches to reduce single occupant car travel to work and the associated greenhouse gas (GHG) emissions. Employers meeting certain requirements in San Joaquin Valley are subject to the eTRIP Rule (Rule 9410).
FAA	Federal Aviation Administration	Federal agency responsible for issuing and enforcing safety regulations and minimum standards, managing air space and air traffic, and building and maintaining air navigation facilities.
FAARC	Fresno Area Residents for Rail Consolidation	A community group with an interest in consolidating the Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) railroad networks through Fresno.

ACRONYM	TERM	DEFINITION
FAST Act	Fixing America's Surface Transportation Act	The Fixing America's Surface Transportation (FAST) Act is a funding and authorization bill to govern United States federal surface transportation spending. It was passed by Congress on December 3, 2015, and signed by President Barack Obama on December 4, 2015.
FAX	Fresno Area Express	Transit system serving the Fresno Metropolitan Area
FBO	Fixed Based Operators	A fixed-base operator (FBO) is an organization granted the right by an airport to operate at the airport and provide aeronautical services such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance, flight instruction, and similar services.
FCC	Fresno City College	resno City College (FCC or "Fresno City") is a community college in Fresno, California. It is part of the State Center Community College District (SCCCD) within the California Community Colleges system and accredited by the Accrediting Commission for Community and Junior Colleges of the Western Association of Schools and Colleges.
FCMA	Fresno-Clovis Metropolitan Area	The geographical area representing the combined respective spheres of influence of the cities of Clovis and Fresno.
FCRTA	Fresno County Rural Transit Agency	Transit Agency serving the rural areas of Fresno County
FCTA	Fresno County Transportation Authority	The Fresno County Transportation Authority (FCTA) is the entity created by legislation to administer the Measure C Program(s) and ensure the revenue is received and distributed appropriately.
FFY	Federal Fiscal Year	October 1 through September 30
FHWA	Federal Highway Administration	Federal agency responsible for administering the Federal-Aid Highway Program, which provides federal financial assistance to the states to construct and improve the National Highway System, urban and rural roads, and bridges.
FRA	Federal Railroad Administration	Federal agency created to promulgate and enforce rail safety regulations, administer railroad assistance programs, conduct research and development in support of improved railroad safety and national rail transportation policy, and consolidate government support of rail transportation activities.
FSP	Freeway Service Patrol	The CHP, Caltrans and local transportation agencies joined forces to provide emergency roadside services during commute periods. The goal of the program is to remove impediments to traffic to expedite the flow of traffic.
FSTIP	Federal Statewide Transportation Improvement Program	Caltrans' four-year planning document that is updated every two years (made up of all FTIPs in California)
FTA	Federal Transit Administration	The federal agency responsible for administering federal transit funds and assisting in the planning and establishment of areawide urban mass transportation systems. As opposed to FHWA funding, most FTA funds are allocated directly to local agencies, rather than to Caltrans.
FTIP	Federal Transportation Improvement Program	A three-year list of all transportation projects proposed for federal transportation funding within the planning area of an MPO.
FY	Fiscal Year	July 1 through June 30
GHG	Greenhouse Gases	Components of the atmosphere that contribute to the greenhouse effect. The principal greenhouse gases that enter the atmosphere because of human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases.
GIS	Geographic Information Systems	Powerful mapping software that links information about where things are with information about what things are like. GIS allows users to examine relationships between features distributed unevenly over space, seeking patterns that may not be apparent without using advanced techniques of query, selection, analysis, and display.

ACRONYM	TERM	DEFINITION
GRAT	Ground Water Assessment Tool	The Groundwater Recharge Assessment Tool (GRAT) is a tool developed by Sustainable Conservation and The Earth Genome which integrates hydrologic, agronomic and geologic science with the best available data from local, state and federal source in order to give California's Groundwater Sustainability Agencies (GSAs) the essential insights they need to optimize their potential for groundwater recharge.
HAL	Healthy Air Living	Healthy Air Living is an initiative developed by the San Joaquin Valley Air Pollution Control District that provides education and opportunities to make personal or professional changes that will result in improvements in air quality.
HCD	California Department of Housing and Community Development	HCD is a State agency that provide leadership, policies, and programs to preserve and expand safe and affordable housing opportunities and promote strong communities for all Californians.
HOV	High Occupancy Vehicle	Generally vehicles with more than one occupant.
HPMS	Highway Performance Monitoring System	A federally mandated program designed by FHWA to assess the performance of the nation's highway system.
HSR	High Speed Rail	Intercity passenger rail service that is reasonably expected to reach speeds of at least 110 mile per hour.
ILS	Instrument Landing System	The Instrument Landing System (ILS) is an internationally normalized system for navigation of aircrafts upon the final approach for landing. It was accepted as a standard system by the ICAO, (International Civil Aviation Organization) in 1947.
IOS	Initial Operating System	A segment of the California High Speed Rail network that will be the first to operate.
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991	Federal transportation planning and policy law (1991-1998).
ITA	Interagency Transer Agreement	An agreement between the State of California and the San Joaquin Joint Powers Authority regarding rail service in the San Joaquin Valley.
ITIP	Interregional Transportation Improvement Plan	The portion of the STIP that includes projects selected by Caltrans (25 percent of STIP funds).
ITS	Intelligent Transportation Systems	Intelligent transportation system (ITS) is the application of sensing, analysis, control and communications technologies to ground transportation in order to improve safety, mobility and efficiency. ITS includes a wide range of applications that process and share information to ease congestion, improve traffic management, minimize environmental impact and increase the benefits of transportation to commercial users and the public in general.
KART	Kings Area Rural Transit	Kings Area Rural Transit (KART) is Kings County's public transportation provider.
JPA	Joint Powers Agency	Two or more agencies that enter into a cooperative agreement to jointly wield powers that are common to them. JPAs are a vehicle for the cooperative use of existing governmental powers to finance and provide infrastructure and/or services in a cost-efficient manner.
LAFCO	Local Agency Formation Commission	LAFCos review proposals for the formation of new local governmental agencies and for changes in the organization of existing agencies.
LOS	Level of Service	A qualitative measurement of traffic flow. Is measured on a scale from A to F in which A signifies the least congested (free flow) while F signifies most congested.
LTF	Local Transportation Fund	Monies distributed to regional transportation planning agencies by the State of California. The annual allocation is the local share of revenues from ¼ cent of the state sales tax rate. COG receives this money and distributes it to the local jurisdictions based on population. The money must first be used to fill any unmet transit needs, and then can be used for local road and street expenses. A small portion of the money is also reserved for pedestrian/bikeway and planning expenditures. Is part of the Transportation Development Act fund.

ACRONYM	TERM	DEFINITION
MAP-21	Moving Ahead for Progress in the 21st Century Act	Federal transportation planning and policy law (2012-2016).
MCC	Model Coordinating Committee	Interagency consultation is generally conducted through the San Joaquin Valley Regional Planning Agencies Interagency Consultation Group (IAC), formerly the San Joaquin Valley Model Coordinating Committee (MCC). The IAC was established by the Regional Planning Agencies' Director's Association to provide a coordinated approach to valley air quality, conformity and transportation modeling issues.
MCTC	Madera County Transportation Commission	Madera County's state designated Regional Transportation Planning Agency (RTPA) and federally designated Metropolitan Planning Organization (MPO).
MJHE	Multi-Jurisdictional Housing Element	California Housing Element law requires every jurisdiction to prepare and adopt a housing element as part of general plans. In California it is typical for each city or county to prepare and maintain its own separate general plan and housing element. However, Fresno County and 12 of the 15 cities in Fresno County, with the help of the Fresno Council of Governments (FCOG), are preparing a Multi-Jurisdictional Housing Element for the fifth round of housing element updates.
MOU	Memorandum of Understanding	A memorandum of understanding is an agreement between two or more parties. It expresses a convergence of will between the parties, indicating an intended common line of action.
MPO	Metropolitan Planning Organization	Federally mandated transportation policy-making organization made up of representatives from local government (required in any urbanized area with a population greater than 50,000).
NAAQS	National Ambient Air Quality Standards	The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment.
NASL	Naval Air Station Lemoore	Naval Air Station Lemoore or NAS Lemoore is a United States Navy base, located in Kings County and Fresno County, California.
NHS	National Highway System	The National Highway System (NHS) is a network of strategic highways within the United States, including the Interstate Highway System and other roads serving major airports, ports, rail or truck terminals, railway stations, pipeline terminals and other strategic transport facilities. Altogether, it constitutes the largest highway system in the world.
NOX	Nitrogen Oxides	When nitrogen is released during fuel combustion it combines with oxygen atoms to create nitric oxide (NO). This further combines with oxygen to create nitrogen dioxide (NO2). Nitric oxide is not considered to be hazardous to health at typical ambient concentrations, but nitrogen dioxide can be. Nitrogen dioxide and nitric oxide are referred to together as oxides of nitrogen (NOx).
NPIAS	National Plan of Integrated Airport Systems	The National Plan of Integrated Airport Systems (NPIAS) identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants under the Airport Improvement Program (AIP). It also includes estimates of the amount of AIP money needed to fund infrastructure development projects that will bring these airports up to current design standards and add capacity to congested airports. The FAA is required to provide Congress with a 5-year estimate of AIP eligible development every two years. The NPIAS contains all commercial service airports, all reliever airports, and selected general aviation airports.
OWP	Overall Work Program	A list of the tasks that the Council of Governments expects to perform over a given year. The program is used as a management tool.
PAC	Policy Advisory Committee	Fresno COG's standing committee comprised of member agency City Managers.

ACRONYM	TERM	DEFINITION
PAPI	Precision Approach Path Indicator	A precision approach path indicator (PAPI) is a visual aid that provides guidance information to help a pilot acquire and maintain the correct approach (in the vertical plane) to an airport or an aerodrome. It is generally located beside the runway approximately 300 meters beyond the landing threshold of the runway.
PEVCC	Plug-in Electric Vehicle Coordinating Council	The San Joaquin Valley PEVCC is a 28-member advisory group composed of local metropolitan planning organizations, cities, counties, utilities, the San Joaquin Valley Clean Cities Coalition, electric vehicle service providers, local consultants and nonprofit organizations.
PPP	Public Participation Plan	Fresno COG's guiding document to fulfilling federal public outreach requirements.
PL-Funds	Metropolitan Planning Funds	Made available to each Metropolitan Planning Organization (MPO) designated for an urbanized area with a population of more than 50,000 individuals and responsible for carrying out the 3-C (continuing, cooperative and comprehensive) metropolitan planning process.
PM 2.5	Particulate matter smaller than 2.5 microns	Very small specks of particulate matter found to be harmful to human health and welfare. The smaller the partial, the more dangerous it is to human health.
PM10	Particulate matter smaller than 10 microns	Tiny specks of particulate matter found to be harmful to human health and welfare.
PRT	Personal Rapid Transit	Personal rapid transit, also referred to as podcars, is a public transport mode featuring small automated vehicles operating on a network of specially built guideways.
PSR	Project Study Report	Defines and justifies the project's scope, cost, and schedule. Prepared for state highway projects and projects not on the State Highway System.
PTIS	Public Transportation Infrastructure Study	An effort to identify strategies for transportation investments and land use policies that would result in measurable reductions in vehicle miles travelled (VMT) and improve mobility choices for greater Fresno County residents.
PUC	Public Utilities Code/ Commission	Regulates privately owned telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation companies.
RACM	Reasonably available control measures	A Reasonably Available Control Measure (RACM) is defined by the USEPA as any potential control measure for application to point, area, onroad and nonroad emission source categories that meets the following criteria: The control measure is technologically feasible; The control measure is economically feasible; The control measure does not cause "substantial widespread and long-term adverse impacts" ; The control measure is not "absurd, unenforceable, or impracticable"; The control measure can advance the attainment date by at least one year.
RFP	Request for Proposals	A document used to solicit bids for a plan or project.
RHGCP	Railroad Highway Grade Crossing Program	The Railway-Highway Crossings (Section 130) Program provides funds for the elimination of hazards at railway-highway crossings. The Section 130 Program has been correlated with a significant decrease in fatalities at railway-highway grade crossings.
RHNA	Regional Housing Needs Allocation	The Regional Housing Need Allocation (RHNA) is the state-mandated process to identify the total number of housing units (by affordability level) that each jurisdiction must accommodate in its Housing Element.
ROG	Reactive Organic Gases	Organic compounds assumed to be reactive at urban/regional scales. Those organic compounds that are regulated because they lead to ozone formation.
RTIP	Regional Transportation Improvement Program	A seven year listing of proposed highway, transit and airport projects that implement the Regional Transportation Plan. Projects are listed in priority order with costs and funding sources identified. COG and other regional transportation planning agencies must prepare this document and submit it to the California Transportation Commission by December 1st of every odd year. Projects must be listed in the RTIP in order to be considered for funding in the State Transportation Improvement Program (STIP).

ACRONYM	TERM	DEFINITION
RTMF	Regional Transportation Mitigation Fee	A fee program intended to ensure that future development contributes to its fair share towards the cost of infrastructure to mitigate the cumulative, indirect regional transportation impacts of new growth in a manner consistent with the provisions of the State of California Mitigation Fee Act.
RTP	Regional Transportation Plan	Metroplitan planning organization (MPO) 25 year transportation planning document that is updated every four years.
RTPA	Regional Transportation Planning Agency	Federally mandated transportation policy-making organization made up of representatives from local government (required in any rural or local area with a population less than than 50,000).
SAFETEA-LU	Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users	Signed into law by President Bush on August 10, 2005, it authorized the federal surface transportation programs for highways, highway safety, and transit for the 5-year period of 2005–2009.
SAR	Search and Rescue	Search and rescue (SAR) is the search for and provision of aid to people who are in distress or imminent danger.
SB 1	Senate Bill 1	Senate Bill 1, the Road Repair and Accountability Act of 2017, was signed into law on April 28, 2017. This legislative package invests $54 billion over the next decade to fix roads, freeways and bridges in communities across California and puts more dollars toward transit and safety.
SB 375	Senate Bill 375	Established to implement the state's greenhouse gas (GHG) emission-reduction goals, as set forth by AB 32, in the sector of cars and light trucks. This mandate requires the California Air Resources Board to determine per capita GHG emission-reduction targets for each metropolitan planning organization (MPO) in the state at two points in the future—2020 and 2035. In turn, each MPO must prepare a Sustainable Communities Strategy (SCS) that demonstrates how the region will meet its GHG reduction target through integrated land use, housing, and transportation planning.
SB 498	Senate Bill 498	Passed in October 2017, SB 498 (Skinner-D) codifies the state's commitment to electric vehicles by requiring that 50 percent of light-duty vehicles purchased for the state vehicle fleet be zero-emission by 2024-25.
SCS	Sustainable Communities Strategy	A plan to reduce greenhouse gas (GHG) emissions through coordinated transportation and land use planning.
SGC	Strategic Growth Council	In September 2008, SB 732 was signed into law, establishing the Strategic Growth Council. The Council is a cabinet level committee that is tasked with coordinating the activities of state agencies to, among other things, improve air and water quality, protect natural resources, promote public health and equity, and improve transportation.
SHOPP	State Highway Operation and Protection Plan	Four year program of projects that have the purpose of collision reduction, bridge and roadway preservation, mobility enhancement and preservation of other transportation facilities
SIP	State Implementation Plan	The planning document prepared to show how the State will attain the national ambient air quality standards.
SJJPA	San Joaquin Joint Powers Authority	To protect the existing San Joaquin Rail Service and to promote its improvement, in 2012, local and regional agencies throughout most of the San Joaquin Corridor (Bakersfield-Fresno-Modesto-Stockton-Sacramento-Oakland) sponsored and supported Assembly Bill 1779 (AB 1779). This bill enabled regional government agencies to form the San Joaquin Joint Powers Authority (SJJPA) to take over the administration and management of the existing San Joaquin Rail Service from the state. AB 1779 was passed by the Legislature on August 30, 2012 with bi-partisan support, and was signed by Governor Brown on September 29, 2012.

ACRONYM	TERM	DEFINITION
SJVAB	San Joaquin Valley Air Basin	The San Joaquin Valley Air Pollution Control District is made up of eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and the San Joaquin Valley Air Basin portion of Kern. The Valley Air District is governed by an fifteen member Governing Board consisting of representatives from the Board of Supervisors of all eight counties, one Health and Science member, appointed by the Governor, one Physician, appointed by the Governor and five Valley city representatives.
SJVAPCD	San Joaquin Valley Air Pollution Control District	The Fresno area is under the auspices of the San Joaquin Valley Air Pollution Control District (SJVAPCD) which works with state and federal air quality agencies to attain health air in the San Joaquin Valley Air Basin.
SJVRC	San Joaquin Valley Rail Committee	The purpose of the San Joaquin Valley Rail Committee (SJVRC) is to discuss and formulate suggestions and ideas for improvements to the Amtrak San Joaquins passenger train service. The SJVRC was established in 1987.
SOV	Single Occupant Vehicle	Privately operated vehicle that contains only one driver or occupant.
SR	State Route	The state highway system of the U.S. state of California is a network of highways that are owned and maintained by the Highway Division of the California Department of Transportation.
SRTP	Short Range Transit Plan	A Short Range Transit Plan (SRTP) is the document that generally plans out transit services and operations. The SRTP planning period is generally five years, but SRTPs may cover a longer period, typically seven to 10 years.
SSM	Supplemental safety measures	Safety improvements approved by the Federal Railroad Administration, typically in quiet zones, such as gates, median barriers, and channelization.
SSTAC	Social Service Transportation Advisory Council	Committee that reviews transit issues with emphasis on the annual identification of transit needs within Fresno County.
STA	State Transit Assistance	State funding program for mass transit operations and capital projects. Current law requires that STA receive 50 percent of PTA revenues.
STBG	Surface Transportation Block Grant	The Surface Transportation Block Grant program (STBG) provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.
STIP	Statewide Transportation Improvement Program	Caltrans four year planning document that is updated every two years.
STP	Surface Transportation Program	Provides flexible funding that may be used by states and localities for projects on any federal-aid highway, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities. A portion of funds reserved for rural areas may be spent on rural minor collectors.
TAC	Technical Advisory Committee	A committee that provides ideas and feedback on plans or programs.
TAZ	Traffic Analysis Zones	Zone system used in travel demand forecasting.
TCCR	Transportation Corridor Concept Reports	Transportation Corridor Concept Reports are Caltrans' long range planning documents for each State Highway Route. The TCCR provides information regarding route segments, including high priority projects for the highway over the next 20 years, and existing and forecasted traffic data.
TCM	Transportation Control Measure	A project or program that is designed to reduce emissions or concentrations of air pollutants from transportation sources. TCMs are referenced in the State Implementation Plan (SIP) for the applicable air basin and have priority for programming and implementation ahead of non-TCMs.
TDA	Transportation Development Act	State law enacted in 1971 that provided a 0.25 percent sales tax on all retail sales in each county for transit, bicycle, and pedestrian purposes. In non-urban areas, funds may be used for streets and roads under certain conditions.
TDM	Transportation Demand Management	Strategies that result in more efficient use of transportation resources, such as ridesharing, telecommuting, park-and-ride programs, pedestrian improvements, and alternative work schedules.

ACRONYM	TERM	DEFINITION
TEA-21	Transportation Equity Act for the 21st Century	Federal transportation planning and policy law (1998-2005).
TIRCP	Transit and Intercity Rail Capital Program	The Transit and Intercity Rail Capital Program (TIRCP) was created by Senate Bill (SB) 862 (Chapter 36, Statutes of 2014) and modified by Senate Bill 9 (Chapter 710, Statutes of 2015) to provide grants from the Greenhouse Gas Reduction Fund to fund transformative capital improvements that will modernize California's intercity, commuter, and urban rail systems, and bus and ferry transit systems to reduce emissions of greenhouse gases by reducing congestion and vehicle miles traveled throughout California. The goal of the TIRCP is to provide monies to fund transformative capital improvements that modernize California's intercity rail, bus, ferry and rail transit systems.
TMA	Transportation Management Areas	The Transit and Intercity Rail Capital Program (TIRCP) was created by Senate Bill (SB) 862 (Chapter 36, Statutes of 2014) and modified by Senate Bill 9 (Chapter 710, Statutes of 2015) to provide grants from the Greenhouse Gas Reduction Fund to fund transformative capital improvements that will modernize California's intercity, commuter, and urban rail systems, and bus and ferry transit systems to reduce emissions of greenhouse gases by reducing congestion and vehicle miles traveled throughout California. The goal of the TIRCP is to provide monies to fund transformative capital improvements that modernize California's intercity rail, bus, ferry and rail transit systems.
TNC Transportation Network Company	Transportation Network Company	A transportation network company (TNC), sometimes known as a mobility service provider (MSP), is an organization that pairs passengers via websites and mobile apps with drivers who provide such services. Transportation network companies are examples of the sharing economy and shared mobility.
TOD	Transit Oriented Development	A planning strategy that explicitly links land-use and transportation by focusing mixed housing, employment, and commercial growth around bus and rail stations (usually within ½ mile). TODs can reduce the number and length of vehicle trips by encouraging more bicycle/pedestrian and transit use and can support transit investments by creating the density around stations to boost ridership.
TSM	Transportation Systems Management	The Transportation Systems Management (TSM) approach to congestion mitigation seeks to identify improvements to enhance the capacity of existing system of an operational nature. Through better management and operation of existing transportation facilities, these techniques are designed to improve traffic flow, air quality, and movement of vehicles and goods, as well as enhance system accessibility and safety.
TTC	Transportation Technical Committee	The Transportation Technical Committee (TTC) serves as a standing committee that reviews materials and issues monthly before forwarding them to the Policy Advisory Committee. Membership includes member agency staff and representatives from a wide variety of transportation and community interest groups.
UP/UPRR	Union Pacific Railroad	Union Pacific Corporation (NYSE:UNP) is one of America's leading transportation companies. Its principal operating company, Union Pacific Railroad, is North America's premier railroad franchise, covering 23 states across the western two-thirds of the United States.
VMT	Vehicle Miles Travelled	On highways, a measurement of the total miles traveled by all vehicles in the area for a specified time period. It is calculated by the number of vehicles times the miles traveled in a given area or on a given highway during the time period. In transit, the number of vehicle miles operated on a given route or line or network during a specified time period.
VOC	Volatile Organic Compound	Organic gases emitted from a variety of sources, including motor vehicles, chemical plants, refineries, factories, consumer, and commercial products, and other industrial sources. Ozone, the main component of smog, is formed from the reaction of VOCs and NOx in the presence of heat and sunlight.
YARTS	Yosemite Area Regional Transportation System	A public transit in the Yosemite region, with buses entering Yosemite Valley from Merced, Mammoth Lakes, Sonora, and Fresno—as well as many different towns along the way. YARTS began service in May 2000, and now provides an alternative to driving to nearly 100,000 riders per year.

Appendix I: Traffic Operations Memorandum

Reverse Triangle Transportation Area Plan

Intersection Operations Analysis

Prepared for:

Fresno Council of Governments

Draft

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

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- Recommendation Reports

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 1.1 presents the Study Area Map.

This south Fresno region encompasses approximately 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.

GHD has prepared this 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. The TIAR also develop projections for future year analysis and identify potential recommended solutions.

FIGURE 1.1

CITY OF FRESNO

CALWA

MALAGA

EASTON

FOWLER

99

41

Church Ave

Jensen Ave

North Ave

Central 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

State Route (Freeway)
Roads
Rail
Fresno County
City of Fresno (city limits)
Sphere of Influence Boundary
Triangle Industrial Study Area
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 01/31/2020

Fresno Council of Governments

GHD

\\ghdnet\ghd\US\Visalia\Projects\Legacy\Prj2618\G2618\Maps\Working\Study Area Map.mxd
Print date: 24 May 2021 - 01:37

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 1.2 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.

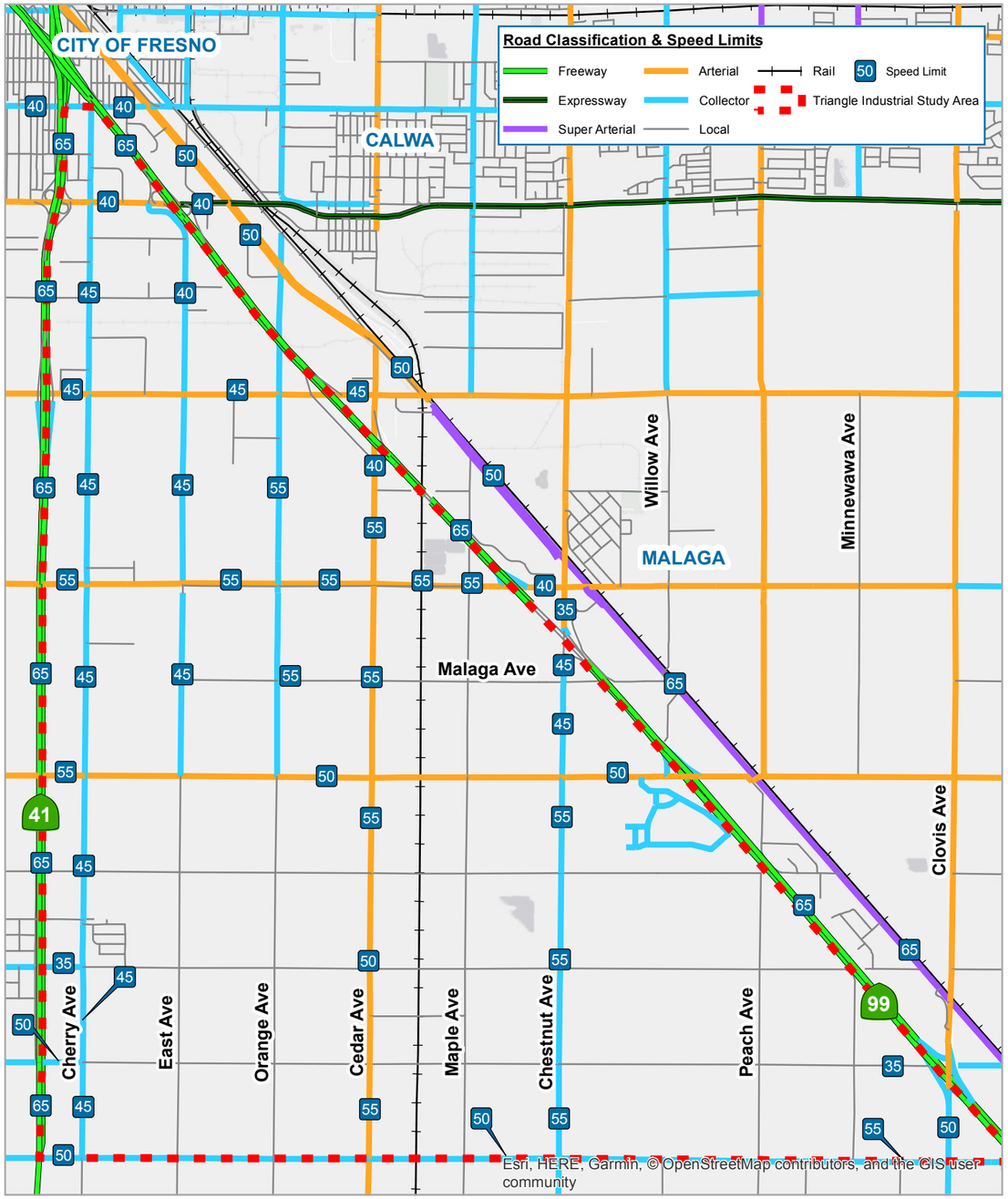
Cherry Avenue is a 2-lane collector roadway, approximately 5.5 miles in length within the study area. North of Central Avenue to Church Avenue, Cherry Avenue is classified as a truck route. Additionally, Cherry Avenue is the frontage road to Orange Elementary, Cherry Avenue Auction and Fire Station #89.

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. 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). 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. 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. This roadway is not part of the truck route system.



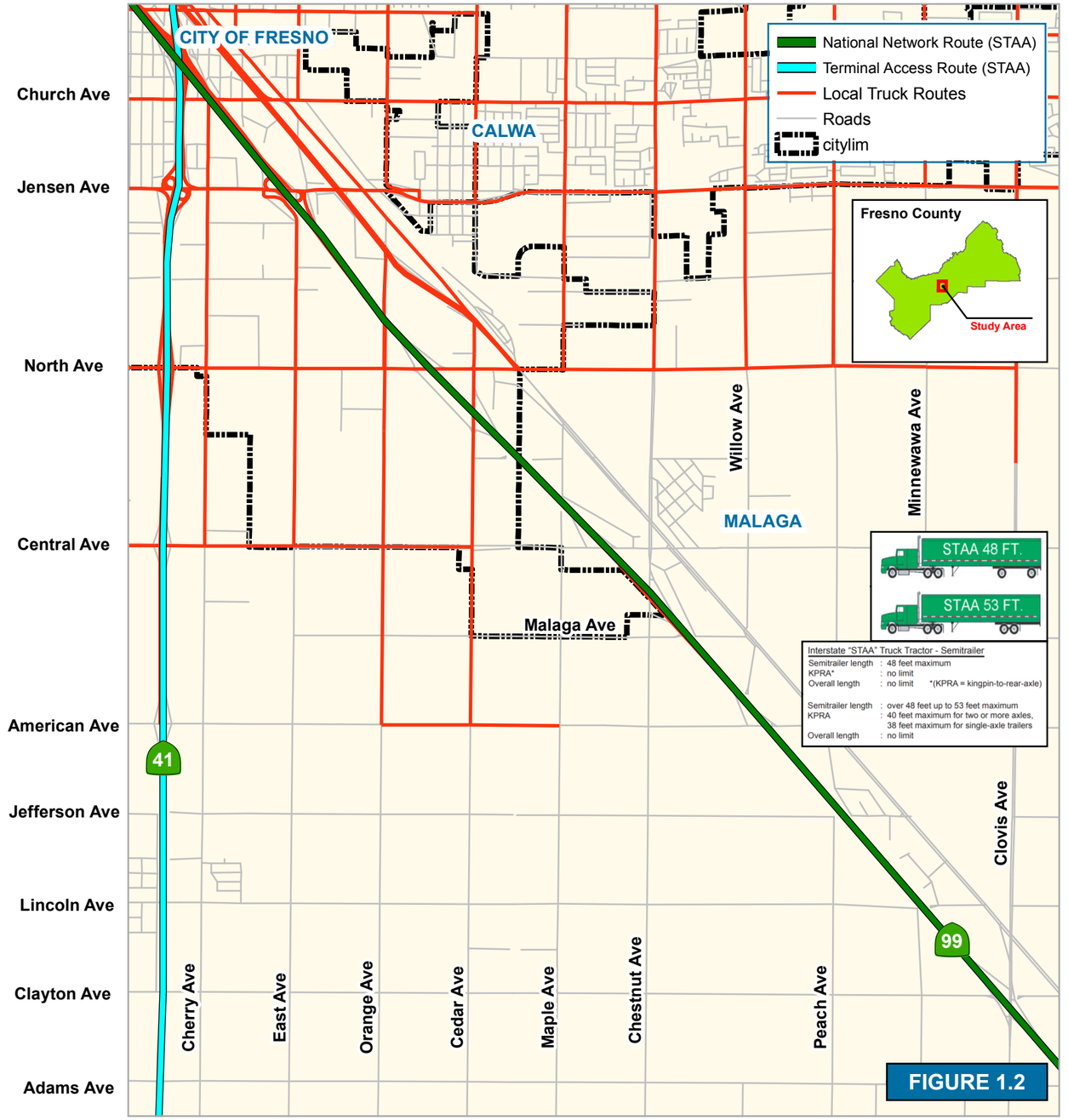


FIGURE 1.2

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: 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

Chestnut Avenue is a 2-lane collector roadway, approximately 3.0 miles in length within the study area. 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. 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. 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.

East – West Alignment

Church Avenue is a 2-lane collector roadway, approximately ¼ of a mile in length within the study area. 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. 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. 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. 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. 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. 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. 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 40 intersections and 8 road

segments as listed in Table 1.1. Figure 1.3 illustrates the study intersections and road segments for analysis.

Table 1.1 Study Intersections and Road Segments

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

Notes: **Traffic volume intersections counts provided by City of Fresno (bold).**
Daily segment volumes provided by County of Fresno.
Traffic volumes intersection counts provided by Caltrans.
Traffic volumes intersection counts taken by Metro Traffic Data, Inc.

FIGURE 1.3

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)
   Cedar Ave / NB Off-Ramp (southbound)
7. Cedar Ave / SB On-Ramp (Parkway Dr)
8. Central Ave / SB Off-Ramp
9. Central Ave / NB On-Ramp
10. Central Ave / Chestnut Ave
11. Chestnut Ave / NB Off-Ramp (northbound)
    Chestnut Ave / SB On-Ramp (southbound)
12. Chestnut Ave / SB Off-Ramp
13. American Ave / SB Off-Ramp
14. American Ave / NB On-Ramp
15. Clovis Ave / NB On-Ramp
16. Clovis Ave / NB Off-Ramp (northbound)
    Clovis Ave / NB Off-Ramp (southbound)
17. Clovis Ave / SB On-Ramp
18. Clayton Ave / SB Off-Ramp
19. Adams Ave / NB On-Ramp
20. Adams Ave / SB Off-Ramp

Highway 41 Corridor:

21. Jensen Ave / HWY 41 NB Off-Ramp
22. Jensen Ave / HWY 41 SB Off-Ramp
23. North Ave / HWY 41 NB Off-Ramp
24. North Ave / HWY 41 SB Off-Ramp
25. Central Ave / HWY 41 NB/SB Off-Ramps
26. American Ave / HWY 41 NB/SB Off-Ramps
27. Adams Ave / HWY 41 NB/SB Off-Ramps

Within Project Area:

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

Road Segments:

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

CITY OF FRESNO
CALWA
MALAGA
EASTON
FOWLER
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
99
41

Fresno County
Study Area

Roadway Segment Counts
State Route (Freeway)
Roads
Rail
Fresno County
City of Fresno (city limits)
Sphere of Influence Boundary
Triangle Industrial Study Area
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 Intersections and Road Segments

Project No. 11192258
Date 01/31/2020

Fresno Council of Governments
GHD

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Print date: 24 May 2021 - 01:44
Paper Size ANSI B (portrait)

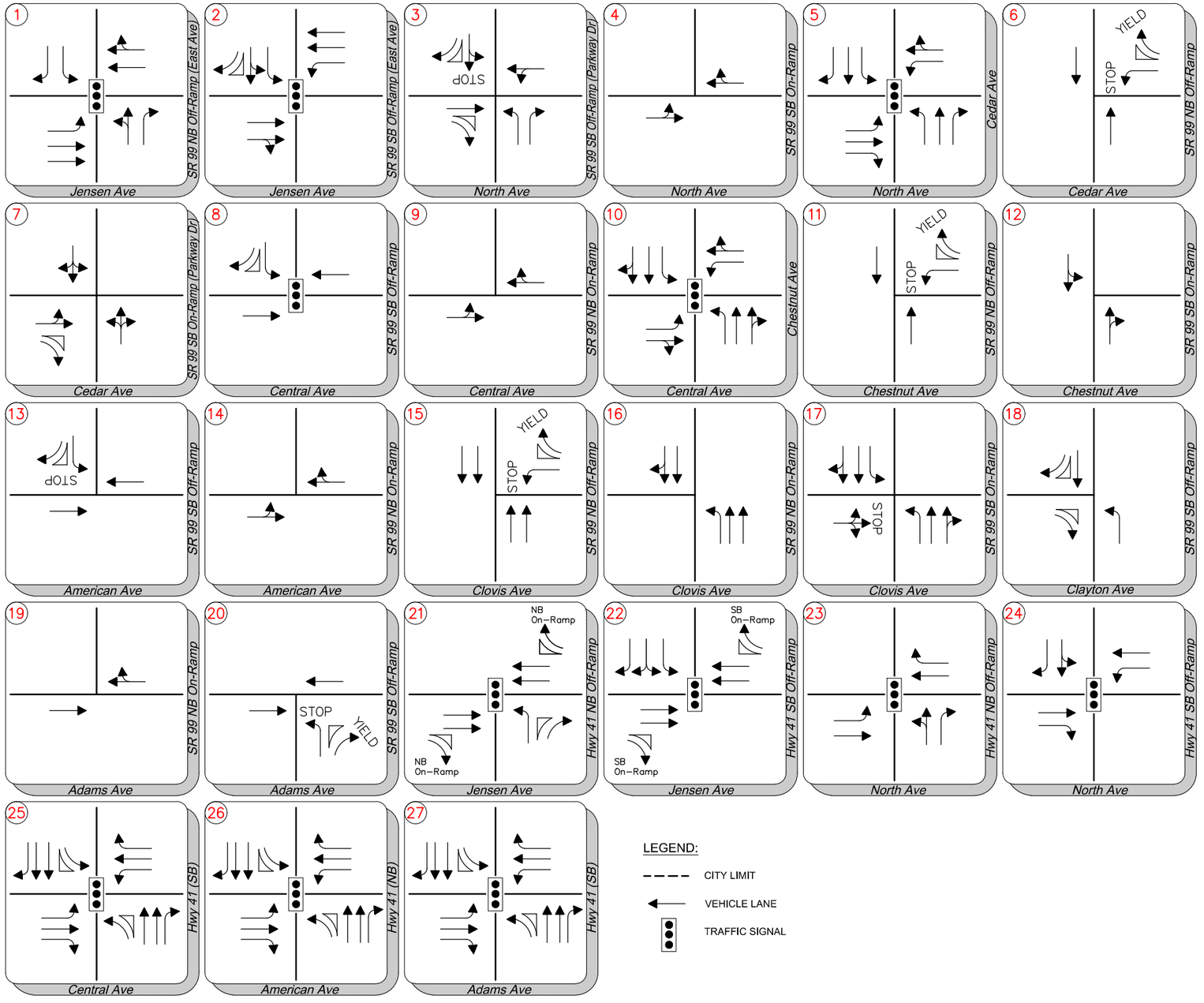
Data source: GHD 2019, Fresno County Public GIS data, City of Fresno Public GIS data, Caltrans Public GIS data. Created by: jramirez2
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

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 1.1)

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 1.4A and 1.4B presents the existing intersection lane geometrics and traffic controls. Figure 1.5A and 1.5B presents the existing weekday AM and PM peak hour volumes.



REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

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Fresno Council of Governments

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Fresno COG
REVERSE TRIANGLE TRANSPORTATION AREA PLAN

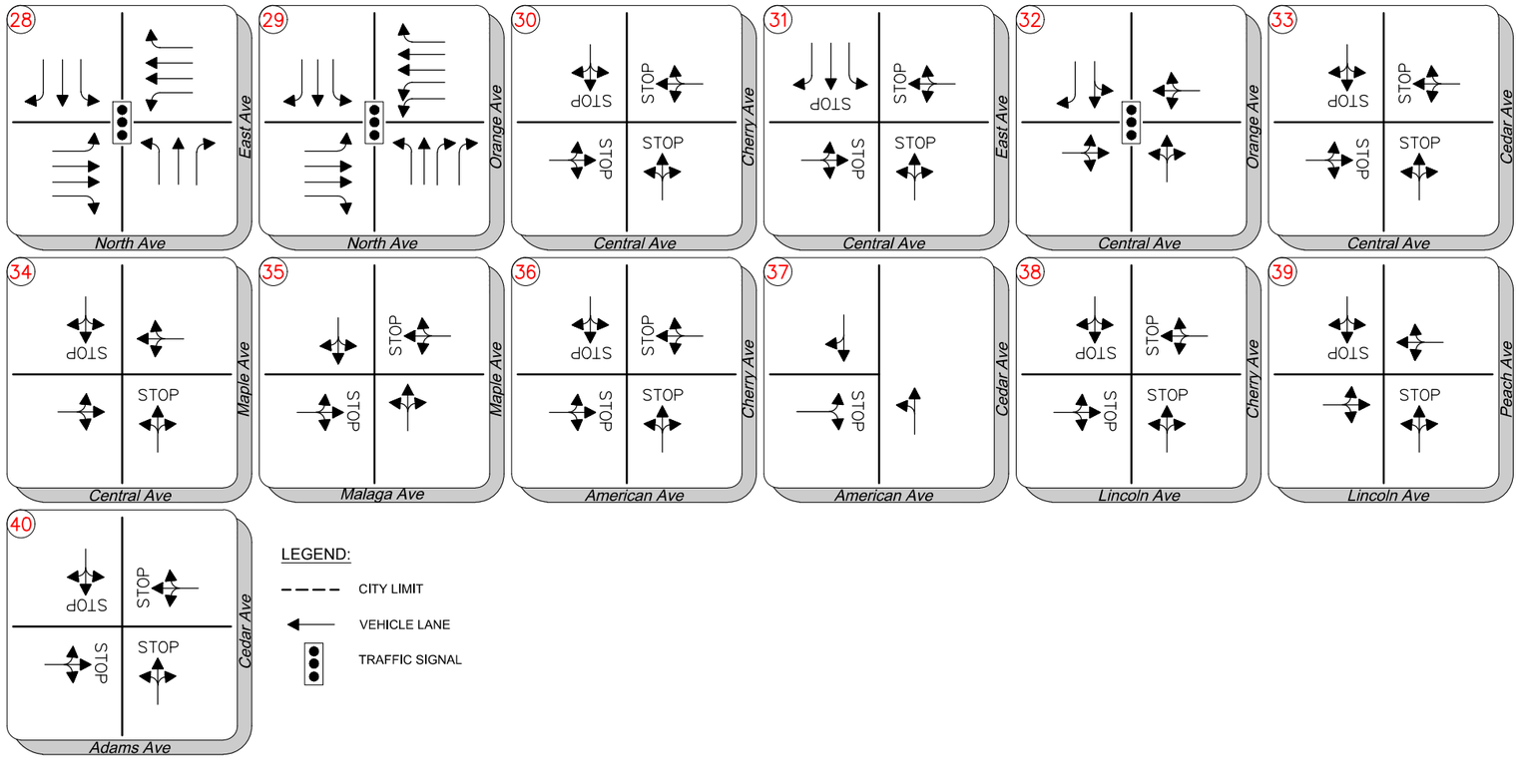
EXISTING LANE GEOMETRICS AND CONTROL

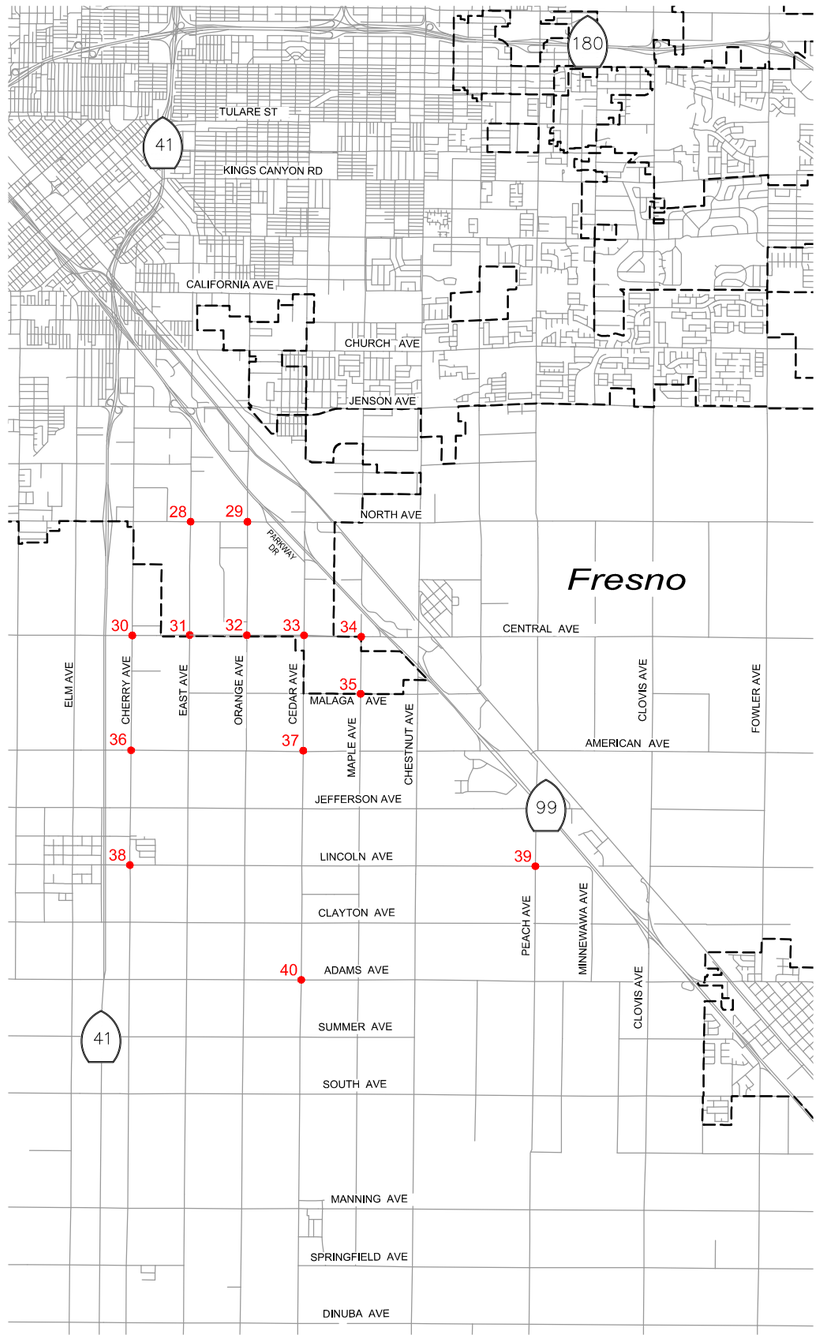
Project No. 11192258
Report No. 001
Date 01.31.2020

FIGURE 1.4A

Filename: L:\Prj\2618\T2618\T2618TG001.dwg Plot Date: 29 January 2020 - 4:42 PM

Source:





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 01.31.2020

FIGURE 1.4B

Filename: L:\Prj\2618\T2618\T2618TG001.dwg Plot Date: 29 January 2020 - 4:43 PM

Source:

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

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REVERSE TRIANGLE TRANSPORTATION AREA PLAN

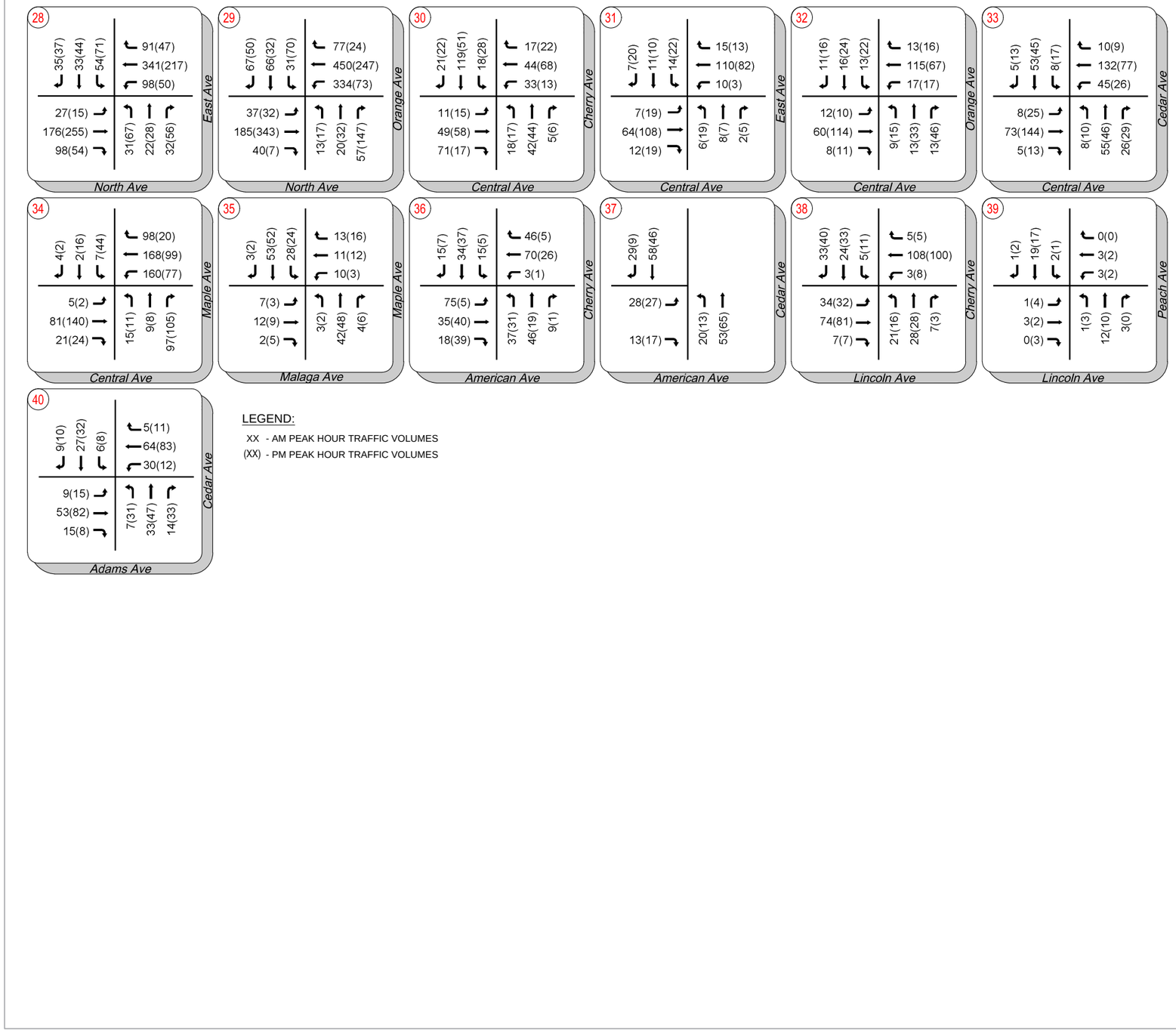
EXISTING PEAK HOUR TRAFFIC VOLUMES

Project No. **11192258**
Report No. **001**
Date **05.24.2021**

FIGURE 1.5A

Filename: L:\Prj\2618\T2618TG001.dwg Plot Date: 23 May 2021 - 9:24 PM

Source:



REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

N

Fresno Council of Governments

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REVERSE TRIANGLE TRANSPORTATION AREA PLAN

EXISTING PEAK HOUR TRAFFIC VOLUMES

Project No. **11192258**
Report No. **001**
Date **05.24.2021**

FIGURE 1.5B

Filename: L:\Prj\2618\T2618TG001.dwg Plot Date: 23 May 2021 - 9:27 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 1.2 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

The following guidelines are based up the City of Fresno General Plan *Mobility and Transportation Element* (December 2014).

Standards for Multi-Modal Level of Service

This General Plan calls for the City to use a more flexible system of multi-modal measures or indicators of "Level of Service" (LOS) provided by public roadways to evaluate current and projected conditions for each mode of travel and identify congestion points or deficiencies which need to be addressed in planning for future improvements. Historically, LOS analysis has been auto-oriented and relied upon a conventional perspective of the primary use of public streets by motor vehicles rather than considering all modes of travel, including public transportation, bicycling and walking. This system provides a ranking of the efficiency of a street segment or intersection with six categories ranging from A (free traffic flow with individual vehicles virtually unaffected by the presence of other vehicles) to F (forced, stop-and-go travel with the volume of vehicles substantially exceeding the capacity of the street and often referred to as "gridlock"). A multi-modal LOS system would address the frequency of bus service or the width of sidewalk clear zones for pedestrians and how many people are served by a facility, whatever their mode of travel, rather than just how many cars get through an intersection.

Level of service is typically evaluated using a peak hour travel condition rather than a 24-hour average daily travel condition - when is traffic at its worst. LOS A, therefore, would appear to be a good grade to achieve. But it is actually a result of overbuilding the system, resulting in wasted money, resources, land, and increased impacts from the facility, such as encroaching closer than

Table 1.2 – 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

necessary to existing houses or removing of houses unnecessarily. However, LOS F is not always good either, resulting in increased commute times, more idling cars resulting in increased emissions, and driver frustration. In analyzing current and future projected conditions there needs to be exceptions to standards where it would not be reasonably feasible to provide the sufficient street width to make improvements necessary to accommodate projected peak hour traffic volumes to attain the set LOS for that roadway or intersection. Congestion, especially if only for short periods of time, can be more fiscally prudent compared to the costs and impacts of facility improvements and maintenance that at the same time may contribute to an overbuilt system. Additionally, congestion can incentivize the use of transit or other modes of transportation that more efficiently move people, save tax dollars, and are better for local air quality.

Context-Sensitive LOS

A more dense urban development pattern will focus traffic increases within the urban core of the city when compared to a less dense pattern where development is located on the urban fringe. However, a denser development pattern brings with it more travel mode choices and can result in shorter trips and more trips made by bus, by bicycle or on foot, compared to a more dispersed pattern. Thus, more compact infill development tends to have a smaller impact per dwelling unit on roadway level of service and the demand for street widening and extension as compared with more dispersed development at the urban edge. An example of this is the congestion that currently occurs on Friant Road during the AM and PM peak periods in northeast Fresno due to low-density development on the urban fringe, as compared to the low level of congestion that occurs in the area around the Tower District. The General Plan envisions that a context-sensitive LOS system can be developed which will be more responsive to the City's needs and support achieving the urban form concepts of the Plan.

All-Day vs. Peak Period Use

LOS is measured based on traffic conditions during the morning and evening peak periods. Good or satisfactory conditions ("free flow" at LOS A to "tolerable delays" at LOS D) are ascribed to roadways where congestion does not become acute even during rush hour. Meeting this standard requires the construction of roadways that provide far more capacity than is needed for most hours of the day. Accommodating a LOS of D or better for vehicular traffic may necessitate six- and eight-lane roadways with dual left turn lanes. These roadways then become extremely wide and unfriendly for pedestrian and bicycle use. Responding to this problem, the General Plan sets a direction for a Complete Streets system that will be more efficiently used. This may mean a greater emphasis on distributing traffic across a more connective network, and a greater tolerance for peak-hour congestion. Multi-Modal LOS As mentioned above, the General Plan proposes a balanced transportation system that serves public transit, bicyclists and pedestrians as well as motor vehicles. This multimodal system will support more compact development patterns, which in turn will support other goals, including farmland preservation and neighborhood walkability. Less reliance on the automobile is critical for Fresno if the city is to improve air quality and reduce greenhouse gas emissions. A multi-modal system will ensure mobility for all community members. Ultimately, a truly multi-modal system is more resilient from a transportation perspective, giving Fresno attributes it needs to manage congestion over the long-term.

Fresno can create a transportation system that performs well for all modes, in part by measuring performance with qualitative indicators for each mode based on inputs covering facility design, facility controls, and volumes. This multi-modal LOS concept is illustrated in Table 4-2. Implementing a multi-modal LOS standard would require the consideration of all travel modes when evaluating traffic congestion and needed mitigation such that widening roads at the expense of walking and bicycling—a result that ironically is much more expensive for private development to build, the public sector to maintain, and adds more traffic to streets since other travel modes are no longer possible - would not explicitly be considered reasonable or acceptable mitigation. A multi-modal LOS system will also help support the development of more intense land uses where desired by permitting localized automobile congestion if walking, biking, and transit systems operate at high levels. A multi-modal LOS standard does not define an overall grade for a roadway section, but provides information for each travel mode to properly assess, for that facility, the best approach to improve its travel capacity with the financing available. Based on a project's location, the proposed improvements will be different. A more suburban intersection may add capacity with a double left turn lane where at a Downtown intersection it may be determined infeasible due to the lack of available right-of-way, or pedestrian islands are required to improve pedestrian flow and intersection wait times.

TABLE 4-2: MULTI-MODAL LEVEL OF SERVICE INDICATORS

LOS	Transit	Bicycle	Pedestrian
A	(Good walk access to bus stops, frequent service, good bus stop amenities.)	(Few driveway and cross street conflicts, good pavement condition, ample width of outside lane, including parking and bike lanes.)	(Low traffic volumes, wide buffer separating sidewalk from traffic, numerous street trees, and high parking occupancy.)
B			
C			
D			
E			
F	(Poor walk access to bus stops, infrequent service, poor schedule adherence, no bus stop amenities.)	(Poor pavement condition, narrow width of outside lane, frequent driveways and cross streets.)	(High traffic volumes, limited buffer separating sidewalk from traffic, few street trees, low parking occupancy.)

Source: Dowling Associates, 2010.

3.2.2 County of Fresno LOS Guidelines[1]

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

[1] Fresno County Guidelines for the Preparation of Traffic Impact Studies (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:

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[2]

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 1.3 illustrated the type of facility and its measure of effectiveness as described in the TIS. Additionally, Table 1.4 shows the transition between LOS "C" and LOS "D" criteria for signalized intersections and terminals.

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

Table 1.3 – 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 1.4 – 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

3.3 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 1.5 presents technical parameters which were applied to study intersections during the analysis.

Table 1.5 – 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 1.6 presents intersection operations for the *Existing* conditions.

Table 1.6 – 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	21.6	C	—	18.3	B	—
2	Jensen Avenue / SR-99 SB Off-Ramp (East Avenue)	Signal	D	53.0	D	—	43.7	D	—
3	**North Avenue / SR-99 SB Off-Ramp (Parkway Dr)**	**TWSC**	**D**	**274.4**	**F**	**Yes**	**85.2**	**F**	**Yes**
4	North Avenue / SR-99 SB On-Ramp	FF	D	N/A			N/A		
5	North Avenue / Cedar Avenue	Signal	D	21.9	C	—	19.5	B	—
6	Cedar Avenue / SR-99 NB Off-Ramp (southbound)	TWSC	D	9.9	A	Yes	10.7	B	Yes
7	Cedar Avenue / SR-99 SB On-Ramp (Parkway Dr)	TWSC	D	10.9	B	Yes	10.9	B	Yes
8	Central Avenue / SR-99 SB Off-Ramp	Signal	D	10.0	A	Yes	8.0	A	Yes
9	Central Avenue / SR-99 NB On-Ramp	FF	D	N/A			N/A		

Table 1.6 – 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]
10	Central Avenue / Chestnut Avenue	Signal	D	40.9	D	—	27.5	C	—
11	Chestnut Avenue / SR-99 NB Off-Ramp (southbound)	TWSC	D	17.8	C	Yes	16.4	C	Yes
12	Chestnut Avenue / SR-99 SB On-Ramp	FF	D	N/A			N/A		
13	American Avenue / SR-99 SB Off-Ramp	TWSC	D	12.0	B	Yes	11.9	B	Yes
14	American Avenue / SR-99 NB On-Ramp	FF	D	N/A			N/A		
15	Clovis Avenue / SR-99 NB Off-Ramp (southbound)	TWSC	D	13.7	B	Yes	13.6	B	Yes
16	Clovis Avenue / SR-99 NB On-Ramp	FF	D	N/A			N/A		
17	**Clovis Avenue / SR-99 SB On-Ramps**	**TWSC**	**D**	**67.8**	**F**	**Yes**	**156.4**	**F**	**Yes**
18	Clayton Avenue / SR-99 SB Off-Ramp	TWSC	D	9.1	A	Yes	9.5	A	Yes
19	Adams Avenue / SR-99 NB On-Ramp	FF	D	N/A			N/A		
20	Adams Avenue / SR-99 SB Off-Ramp	TWSC	D	9.0	A	Yes	9.8	A	Yes
21	Jensen Avenue / HWY-41 NB Off-Ramp	Signal	D	5.9	A	—	8.7	A	—
22	Jensen Avenue / HWY-41 SB Off-Ramp	Signal	D	23.2	C	—	19.5	B	—
23	North Avenue / HWY-41 NB Off-Ramp	Signal	D	7.3	A	—	9.2	A	—
24	North Avenue / HWY-41 SB Off-Ramp	Signal	D	50.3	D	—	10.9	B	—
25	Central Avenue / HWY-41 NB/SB Off-Ramps	Signal	D	30.8	C	—	24.9	C	—
26	American Avenue / HWY-41 NB/SB Off-Ramps	Signal	D	38.5	D	—	27.2	C	—
27	Adams Avenue / HWY-41 NB/SB Off-Ramps	Signal	D	21.0	C	—	23.0	C	—
28	North Avenue / East Avenue	Signal	D	19.3	B	—	18.8	B	—
29	North Avenue / Orange Avenue	Signal	D	18.3	B	—	18.5	B	—
30	Central Avenue / Cherry Avenue	AWSC	D	8.7	A	No	8.1	A	No
31	Central Avenue / East Avenue	AWSC	D	8.9	A	No	9.7	A	No
32	Central Avenue / Orange Avenue	Signal	D	9.7	A	—	10.1	B	—

Table 1.6 – 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]
33	Central Avenue / Cedar Avenue	AWSC	D	9.4	A	No	10.6	B	No
34	Central Avenue / Maple Avenue	TWSC	D	18.0	C	Yes	19.0	C	Yes
35	Malaga Avenue / Maple Avenue	TWSC	D	10.5	B	Yes	10.1	B	Yes
36	American Avenue / Cherry Avenue	AWSC	D	8.4	A	No	7.5	A	No
37	American Avenue / Cedar Avenue	TWSC	D	10.0	A	Yes	9.5	A	Yes
38	Lincoln Avenue / Cherry Avenue	AWSC	D	8.5	A	No	8.4	A	No
39	Lincoln Avenue / Peach Avenue	TWSC	D	9.2	A	Yes	9.3	A	Yes
40	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; FF = Free Flow
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 1.6, 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)
- #17 - 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 1.7 contains a summary of the roadway segments LOS results under Existing Conditions.

Table 1.7 – 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 1.7, all of the study roadway segments are currently operating at acceptable conditions under Existing conditions.

5. Cumulative Conditions

The *Cumulative* conditions is the analysis scenario in which current operations at study locations are analyzed and establishes the baseline traffic conditions. Cumulative weekday AM and PM peak hour intersection traffic operations were quantified utilizing the Caltrans Fre-99-South-Fresno-IC_Turning-movements, Existing_2019 and Build_Forecast_2046 loaded network modeling Cube files. Total growth rate was calculated per intersection based on the Existing_2019 network and the Build_Forecast 2046 network. Total growth rate calculated was then used for a base line of 20 year scenario, existing conditions 2019 base line with a 2040 base line.

5.1 Intersection Operations

Table 1.8 presents intersection operations for the *Cumulative* conditions. Figure 2.5A and 2.5B presents the Cumulative weekday AM and PM peak hour volumes.

Table 1.8 – Cumulative 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	30.4	C	–	22.9	C	–
2	**Jensen Avenue / SR-99 SB Off-Ramp (East Avenue)**	**Signal**	**D**	**81.0**	**F**	–	**74.0**	**E**	–
3	**North Avenue / SR-99 SB Off-Ramp (Parkway Dr)**	**TWSC**	**D**	**116.1**	**F**		**367.8**	**F**	

Table 1.8 – Cumulative 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]
4	North Avenue / SR-99 SB On-Ramp	FF	D	N/A		—	N/A		—
5	North Avenue / Cedar Avenue	Signal	D	26.7	C	—	26.5	C	—
6	Cedar Avenue / SR-99 NB Off-Ramp (southbound)	TWSC	D	10.0	A		11.0	B	
7	Cedar Avenue / SR-99 SB On-Ramp (Parkway Dr)	TWSC	D	11.5	B		12.0	B	
8	Central Avenue / SR-99 SB Off-Ramp	Signal	D	11.5	B		10.5	B	
9	Central Avenue / SR-99 NB On-Ramp	None	D	N/A		—	N/A		—
10	**Central Avenue / Chestnut Avenue**	**Signal**	**D**	**95.3**	**F**	**—**	**72.6**	**E**	**—**
11	**Chestnut Avenue / SR-99 NB Off-Ramp (southbound)**	**TWSC**	**D**	16.7	C		20.2	C	
12	Chestnut Avenue / SR-99 SB On-Ramp	FF	D	N/A		—	N/A		—
13	American Avenue / SR-99 SB Off-Ramp	TWSC	D	12.0	B		11.4	B	
14	American Avenue / SR-99 NB On-Ramp	FF	D	N/A		—	N/A		—
15	**Clovis Avenue / SR-99 NB Off-Ramp (southbound)**	**TWSC**	**D**	16.8	C		17.9	C	
16	Clovis Avenue / SR-99 NB On-Ramp	FF	D	N/A		—	N/A		—
17	**Clovis Avenue / SR-99 SB On-Ramps**	**TWSC**	**D**	**529.5**	**F**	**No**	**1108.9**	**F**	**Yes**
18	Clayton Avenue / SR-99 SB Off-Ramp	TWSC	D	9.2	A		9.7	A	
19	Adams Avenue / SR-99 NB On-Ramp	FF	D	N/A		—	N/A		—
20	Adams Avenue / SR-99 SB Off-Ramp	TWSC	D	9.2	A		9.7	A	
21	Jensen Avenue / HWY-41 NB Off-Ramp	Signal	D	5.6	A	—	8.8	A	—
22	Jensen Avenue / HWY-41 SB Off-Ramp	Signal	D	20.1	C	—	22.9	C	—
23	**North Avenue / HWY-41 NB Off-Ramp**	**Signal**	**D**	9.2	A	—	**55.4**	**E**	—
24	**North Avenue / HWY-41 SB Off-Ramp**	**Signal**	**D**	**262.7**	**F**	**—**	42.3	D	**—**
25	**Central Avenue / HWY-41 NB/SB Off-Ramps**	**Signal**	**D**	**65.7**	**E**	**—**	**63.1**	**E**	**—**
26	**American Avenue / HWY-41 NB/SB Off-Ramps**	**Signal**	**D**	**90.5**	**F**	**—**	**72.5**	**E**	**—**

Table 1.8 – Cumulative 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]
27	Adams Avenue / HWY-41 NB/SB Off-Ramps	Signal	D	22.0	C	—	31.2	C	—
28	North Avenue / East Avenue	Signal	D	21.2	C	—	21.4	C	—
29	North Avenue / Orange Avenue	Signal	D	37.2	D	—	22.4	C	—
30	Central Avenue / Cherry Avenue	AWSC	D	9.9	A		8.8	A	
31	Central Avenue / East Avenue	AWSC	D	9.4	A		10.7	B	
32	Central Avenue / Orange Avenue	Signal	D	9.8	A	—	10.2	B	—
33	Central Avenue / Cedar Avenue	AWSC	D	10.1	B		11.4	B	
34	Central Avenue / Maple Avenue	TWSC	D	21.5	C	No	**38.7**	**E**	**Yes**
35	Malaga Avenue / Maple Avenue	TWSC	D	11.7	B		10.8	B	
36	American Avenue / Cherry Avenue	AWSC	D	8.6	A		7.7	A	
37	American Avenue / Cedar Avenue	TWSC	D	9.7	A		9.4	A	
38	Lincoln Avenue / Cherry Avenue	AWSC	D	8.3	A		8.1	A	
39	Lincoln Avenue / Peach Avenue	TWSC	D	9.3	A		9.4	A	
40	Adams Avenue / Cedar Avenue	AWSC	D	8.6	A		9.2	A	

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; FF = Free Flow
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 1.8, all study intersections for Cumulative conditions are projected to operate at or above the threshold LOS D, except for the following intersections during the AM and/or PM peak hours:

- #2 Jensen Avenue / SR-99 SB Off-Ramp (East Avenue)
- #3 North Avenue / SR-99 SB Off-Ramp (Parkway Dr)
- #10 Central Avenue / Chestnut Avenue
- #17 Clovis Avenue / SR-99 SB On-Ramps Off-Ramp (southbound)
- #23 North Avenue / HWY-41 NB Off-Ramp
- #24 North Avenue / HWY-41 SB Off-Ramp

- #25 Central Avenue / HWY-41 NB/SB Off-Ramps
- #26 American Avenue / HWY-41 NB/SB Off-Ramps
- #34 Central Avenue / Maple Avenue

5.2 Daily Segment Operations

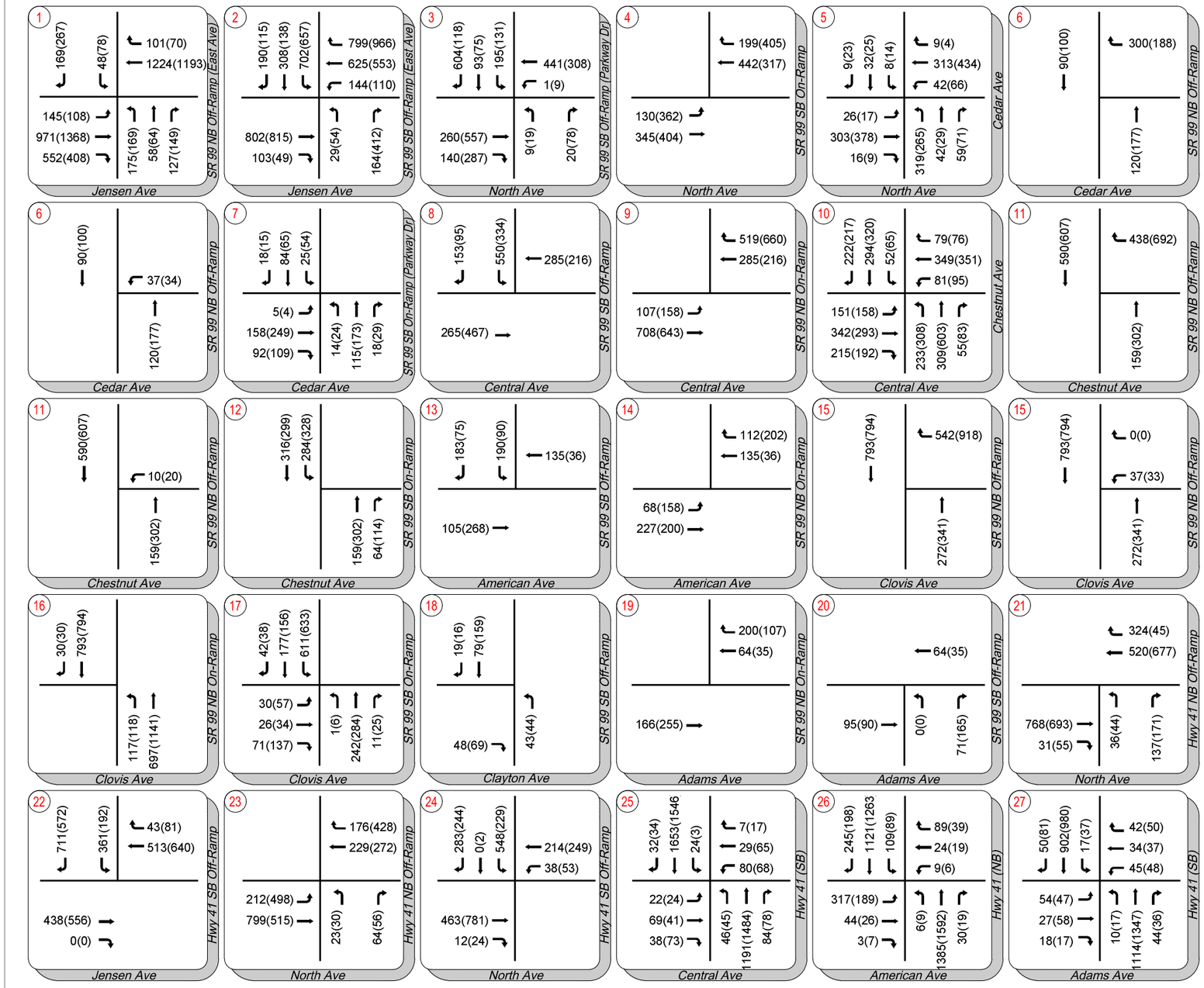
Existing roadway segments were quantified using existing AADT values collected on Wednesday, May 8, 2019. Table 1.9 contains a summary of the roadway segments LOS results under Existing Conditions.

Table 1.9 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 1.9, all of the study roadway segments are currently operating at acceptable conditions under Existing conditions.



REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

N

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REVERSE TRIANGLE TRANSPORTATION AREA PLAN

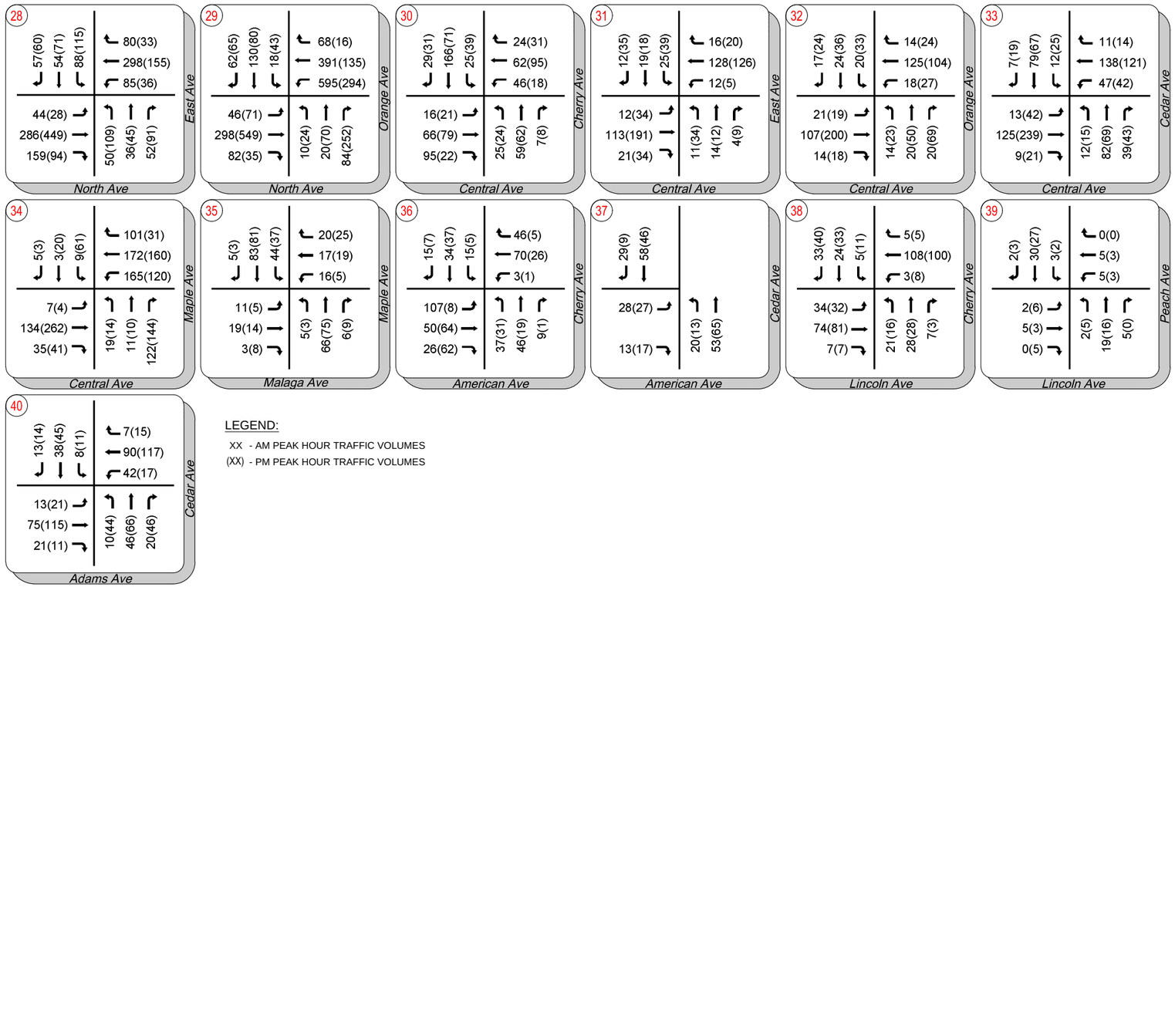
CUMULATIVE PEAK HOUR TRAFFIC VOLUMES

Project No. **11192258**
Report No. **001**
Date **05.24.2021**

FIGURE 2.5A

Filename: \\ghdnet\ghd\US\Visalia\Projects\Legacy\Prj\2618\T2618TG002.dwg Plot Date: 23 May 2021 - 10:37 PM

Source:



REVERSE TRIANGLE
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GHD

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REVERSE TRIANGLE TRANSPORTATION AREA PLAN

CUMULATIVE PEAK HOUR TRAFFIC VOLUMES

Project No. **11192258**
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Date **05.24.2021**

FIGURE 2.5B

Filename: \\ghdnet\ghd\US\Visalia\Projects\Legacy\Prj\2618\T2618TG002.dwg Plot Date: 23 May 2021 - 11:10 PM

Source:

6. Recommended Improvements

This section presents recommended improvements at the study intersections based upon the results of the analysis presented in this report.

6.1 Cumulative Conditions

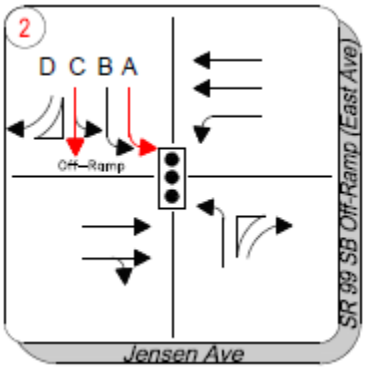
Under Cumulative Conditions all the study intersections are anticipated to operate at the acceptable LOS D or better conditions, except for the following intersections:

- #2 Jensen Avenue / SR-99 SB Off-Ramp (East Avenue)
- #3 North Avenue / SR-99 SB Off-Ramp (Parkway Dr)
- #10 Central Avenue / Chestnut Avenue
- #17 Clovis Avenue / SR-99 SB On-Ramps Off-Ramp (southbound)
- #23 North Avenue / HWY-41 NB Off-Ramp
- #24 North Avenue / HWY-41 SB Off-Ramp
- #25 Central Avenue / HWY-41 NB/SB Off-Ramps
- #26 American Avenue / HWY-41 NB/SB Off-Ramps
- #34 Central Avenue / Maple Avenue

As such the following improvement measures are recommended.

(#2) Jensen Avenue / SR-99 SB Off-Ramp (East Avenue):

This intersection is anticipated to operate as LOS F conditions during the AM peak hour. As such the following improvement measures are recommended:

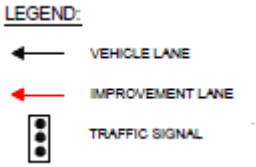


A = Addition of dedicated left-turn

B = Maintain dedicated left-turn movement

C = Alter thru-left movement to dedicated thru movement

D = Alter dedicated right-turn movement to include 350' of storage



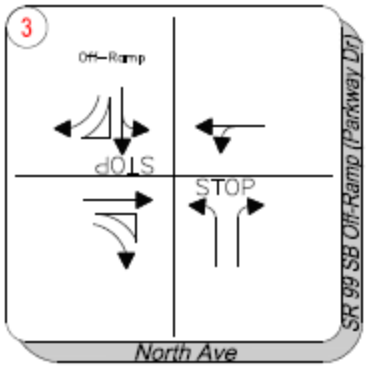
With installation of the above improvement, this intersection is forecasted to operate a LOS D with 36.9 seconds of delay.

Recommended improvements require capacity widening improvement of the off-ramp approach at the intersection to accommodate the additional left-turn lane. Remaining improvements would

require a re-striping of the assigned recommended improvements. No further improvements recommended.

(#3) North Avenue / SR-99 SB Off-Ramp (Parkway Dr):

This intersection is anticipated to operate as LOS F conditions during the PM peak hour. As such the following improvement measures are recommended:

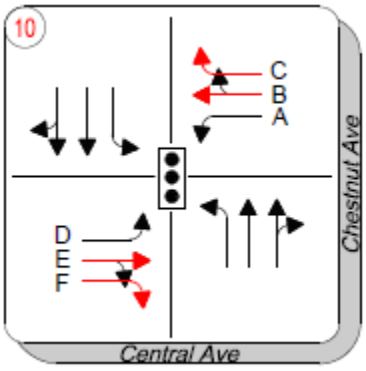


Future Caltrans Funded Improvement

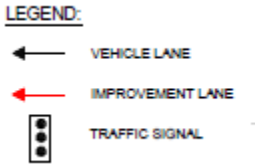
Caltrans is working on several studies within the study area that will identify recommended improvements.

(#10) Central Avenue / Chestnut Avenue:

This intersection is anticipated to operate as LOS F conditions during the AM peak hour. As such the following improvement measures are recommended:



A = Maintain dedicated left-turn movement
B = Alter thru-right movement to dedicated thru movement
C = Addition of dedicated right-turn to include 120' of storage
D = Maintain dedicated left-turn movement
E = Alter thru-right movement to dedicated thru movement
F = Addition of dedicated right-turn to include 120' of storage



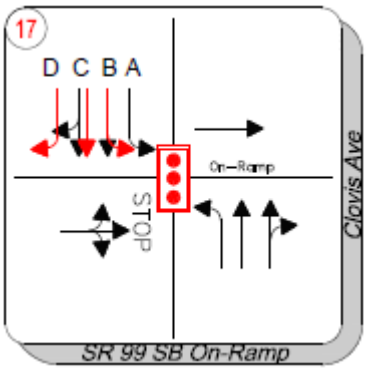
With installation of the above improvement, this intersection is forecasted to operate a LOS D with 41.3 seconds of delay.

Recommended improvements pertain to re-striping of intersection approaches (east-west) to accommodate the additional right turn lanes on each approach. For WB approach, approximate curb/gutter to curb/gutter limits are estimated at 60'. Given the limits, no anticipated right-of-way is

needed. For EB approach, approximate curb/gutter to curb/gutter limits are estimated at +60'. Given the limits, no anticipated right-of-way is needed. No further improvements recommended.

(#17) SR99 SB On-Ramp / Clovis Avenue:

This intersection is anticipated to operate as LOS F conditions during the PM peak hour. As such the following improvement measures are recommended:



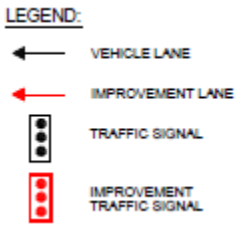
Convert from one-way stop control to signalized control (optimize cycle length).

A = Maintain dedicated left-turn

B = Alter thru-movement to dedicated left-turn movement (150' storage)

C = Alter thru-right movement to dedicated thru movement

D = Addition of right-turn movement (90' storage)

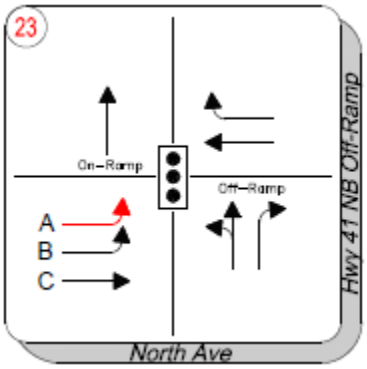


With installation of the above improvement, this intersection is forecasted to operate a LOS B with 10.7 seconds of delay.

Recommended improvements pertain to converting the two-way stop control intersection to a traffic signal and re-striping of intersection SB approach to accommodate the following improvements. Due to high volume of left turns, an additional left turn is proposed, which will require capacity widening improvement. Finally, a dedicated right-turn lane is proposed to allow for dedicated thru movement. No further improvements recommended.

(#23) North Avenue / Hwy 41 NB Off-Ramp:

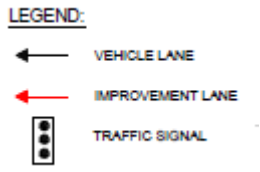
This intersection is anticipated to operate as LOS E conditions during the PM peak hour. As such the following improvement measures are recommended:



A = Addition of dedicated left-turn (250' storage)

B = Maintain left-turn movement

C = Maintain thru movement

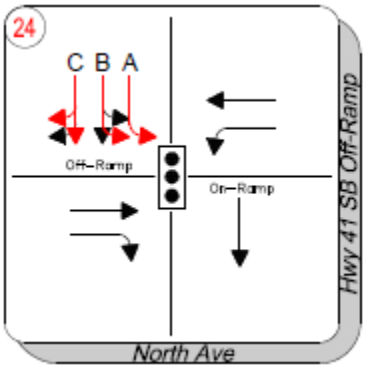


With installation of the above improvement, this intersection is forecasted to operate a LOS B with 12.9 seconds of delay.

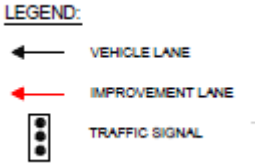
Recommended improvements pertain to re-striping of intersection approaches (east-west) to accommodate the additional EB left-turn lane. Approximate right-of-way from curb/gutter to curb/gutter is 64' (EB approach segment), which can accommodate five 12' lanes (three-EB lanes and two receiving lanes (WB). No further improvements recommended.

(#24) North Avenue / Hwy 41 SB Off-Ramp:

This intersection is anticipated to operate as LOS F conditions during the AM peak hour. As such the following improvement measures are recommended:



A = Addition of dedicated left-turn
B = Alter thru-left movement to dedicated left-turn
C = Alter dedicated right-turn movement to thru-right movement (350' storage)

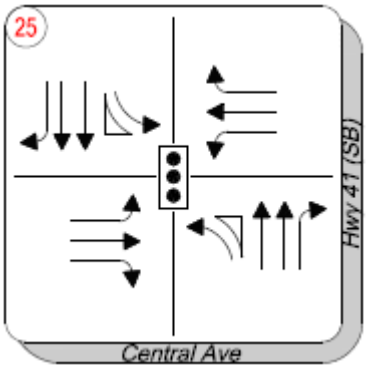


With installation of the above improvement, this intersection is forecasted to operate a LOS B with 14.6 seconds of delay.

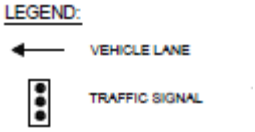
Recommended improvements require capacity widening improvement of the off-ramp approach at the intersection to accommodate the additional left-turn lane. Remaining improvements would require a re-striping of the assigned recommended improvements. No further improvements recommended.

(#25) Central Avenue / Hwy 41:

This intersection is anticipated to operate as LOS E conditions during the AM peak hour. As such the following improvement measures are recommended:



Optimized cycle length

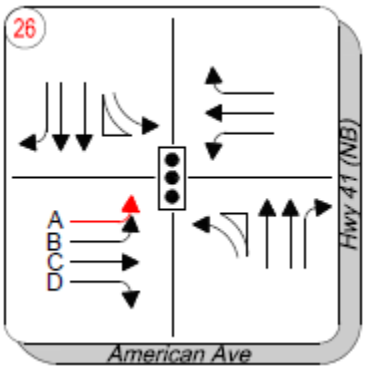


With installation of the above improvement, this intersection is forecasted to operate a LOS D with 41.6 seconds of delay.

Recommended improvement requires optimizing the cycle length. No further improvements recommended.

(#26) Central Avenue / Hwy 41:

This intersection is anticipated to operate as LOS F conditions during the AM peak hour. As such the following improvement measures are recommended:



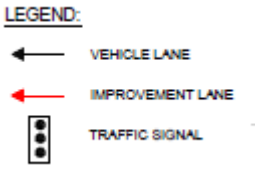
Optimized cycle length

A = Addition of dedicated left-turn (300' storage)

B = Maintain left-turn movement

C = Maintain thru movement

D = Maintain right-turn movement

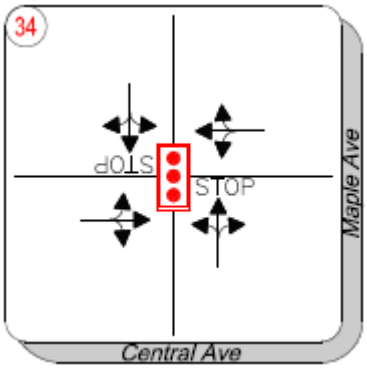


With installation of the above improvement, this intersection is forecasted to operate a LOS D with 40.8 seconds of delay.

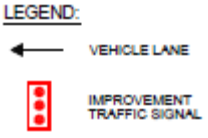
Recommended improvements pertain to re-striping of intersection approaches (east-west) to accommodate the additional EB left-turn lane. Approximate right-of-way from edge of pavement to edge of pavement is 50' (EB approach segment), which can accommodate four 12' lanes (three-EB lanes and one receiving lanes (WB). No further improvements recommended.

(#34) Central Avenue / Maple Avenue:

This intersection is anticipated to operate as LOS E conditions during the PM peak hour. As such the following improvement measures are recommended:



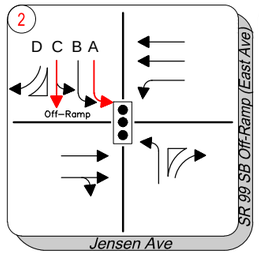
Convert from two-way stop control to signalized control (optimize cycle length).



With installation of the above improvement, this intersection is forecasted to operate a LOS A with 6.8 seconds of delay.

Recommended improvement requires optimizing the cycle length. No further improvements recommended.

Figure 3.1 below presents the recommended improvements.

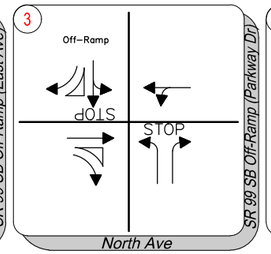


A = Addition of dedicated left-turn

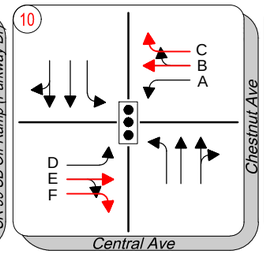
B = Maintain dedicated left-turn movement

C = Alter thru-left movement to dedicated thru movement

D = Alter dedicated right-turn movement to include 350' of storage



Future Caltrans Funded Improvement



A = Maintain dedicated left-turn movement

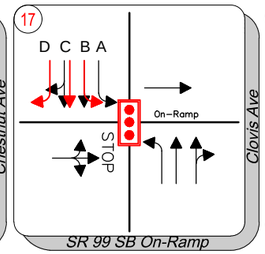
B = Alter thru-right movement to dedicated thru movement

C = Addition of dedicated right-turn to include 120' of storage

D = Maintain dedicated left-turn movement

E = Alter thru-right movement to dedicated thru movement

F = Addition of dedicated right-turn to include 120' of storage



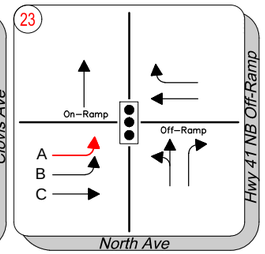
Convert from one-way stop control to signalized control (optimize cycle length).

A = Maintain dedicated left-turn

B = Alter thru-movement to dedicated left-turn movement (150' storage)

C = Alter thru-right movement to dedicated thru movement

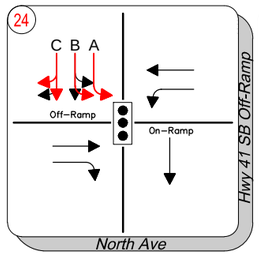
D = Addition of right-turn movement (90' storage)



A = Addition of dedicated left-turn (250' storage)

B = Maintain left-turn movement

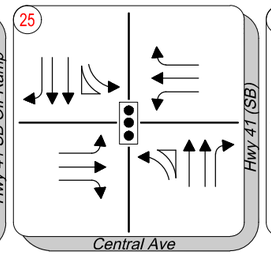
C = Maintain thru movement



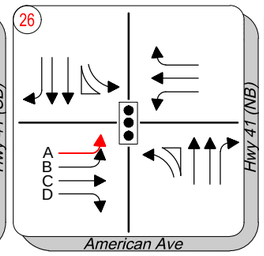
A = Addition of dedicated left-turn

B = Alter thru-left movement to dedicated left-turn

C = Alter dedicated right-turn movement to thru-right movement (350' storage)



Optimized cycle length



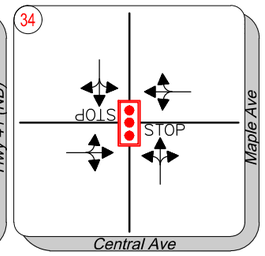
Optimized cycle length

A = Addition of dedicated left-turn (300' storage)

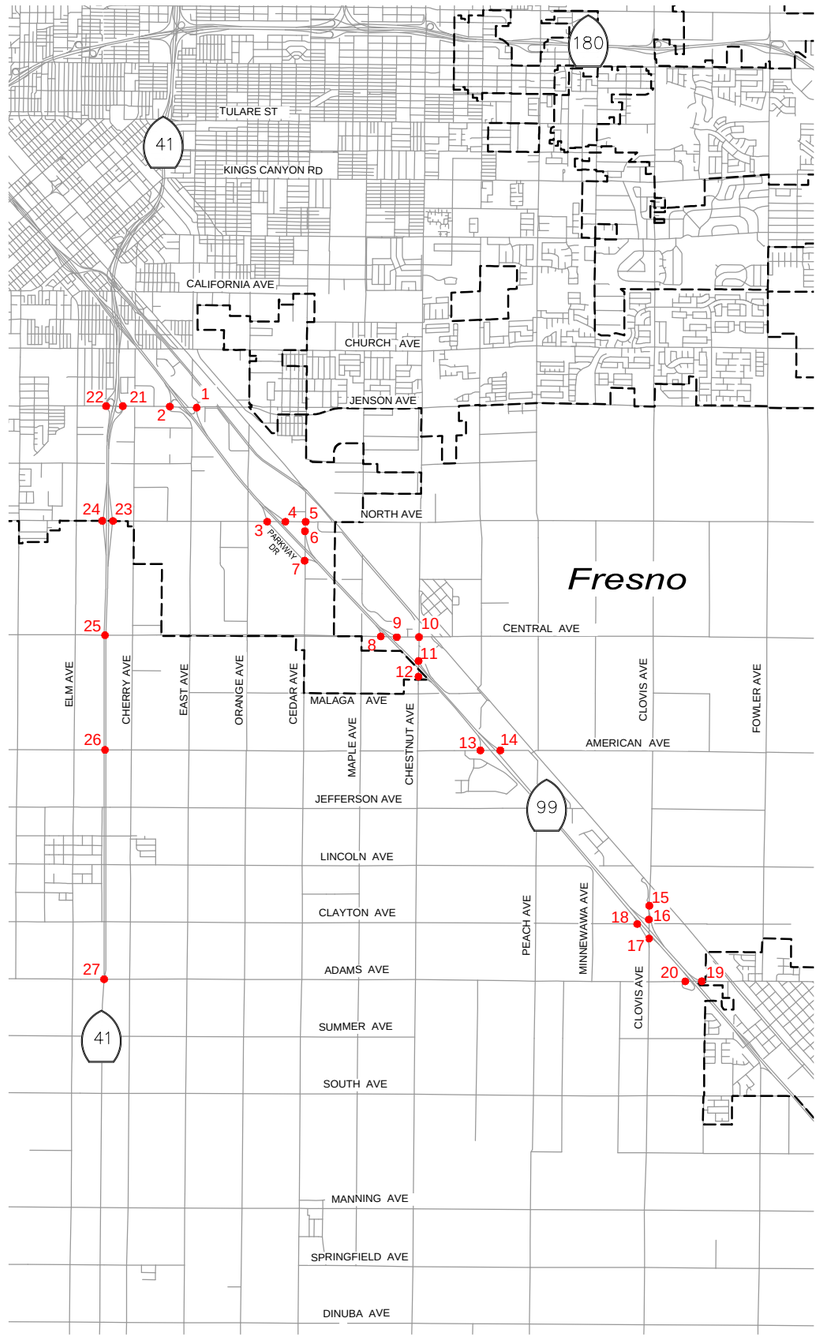
B = Maintain left-turn movement

C = Maintain thru movement

D = Maintain right-turn movement



Convert from two-way stop control to signalized control (optimize cycle length).



LEGEND:

- CITY LIMIT
- EXISTING VEHICLE LANE
- IMPROVEMENT LANE
- EXISTING TRAFFIC SIGNAL
- IMPROVEMENT TRAFFIC SIGNAL

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

N

Fresno Council of Governments

GHD

Fresno COG
REVERSE TRIANGLE TRANSPORTATION AREA PLAN

Recommended Improvements

Project No. **11192258**
Report No. **001**
Date **01.31.2020**

FIGURE 3.1

Filename: L:\Prj\2618\T2618TG002.dwg Plot Date: 14 May 2021 - 11:11 AM

Source:

7. Conclusions

Cumulative traffic operating conditions indicate the study intersections generally meet or exceed current LOS thresholds within the RTTAP area. Deficiencies noted were shown along SR99 interchange off/on ramps and along Hwy 41. Recommended improvements at these intersections included the addition of lanes which could be accommodated by re-striping, capacity increase of intersection approaches to accommodate additional left/right turn lanes, converting existing intersection control to a signalized control and optimizing signalized intersections. Additionally, Caltrans is working on several interchange studies along SR 99 within the study area limits that will identify recommended improvements at North Avenue interchange, Central Avenue interchange and American Avenue interchange.

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 LOS Reports

- Existing Reports
- Cumulative Reports
- Warrant 3 Reports
- Recommendation Reports

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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Appendix J: Economic Conditions Memorandum

NEW ECONOMICS & ADVISORY®

LAND USE ANALYSIS & STRATEGIES

DRAFT MEMORANDUM

To: **Kristine Cai, Fresno COG**

Cc: Gary Mills, GHD

From: Isabel Domeyko and Emily Nguyen

Date: October 21, 2020

Re: Reverse Triangle Transportation Area Economic Conditions

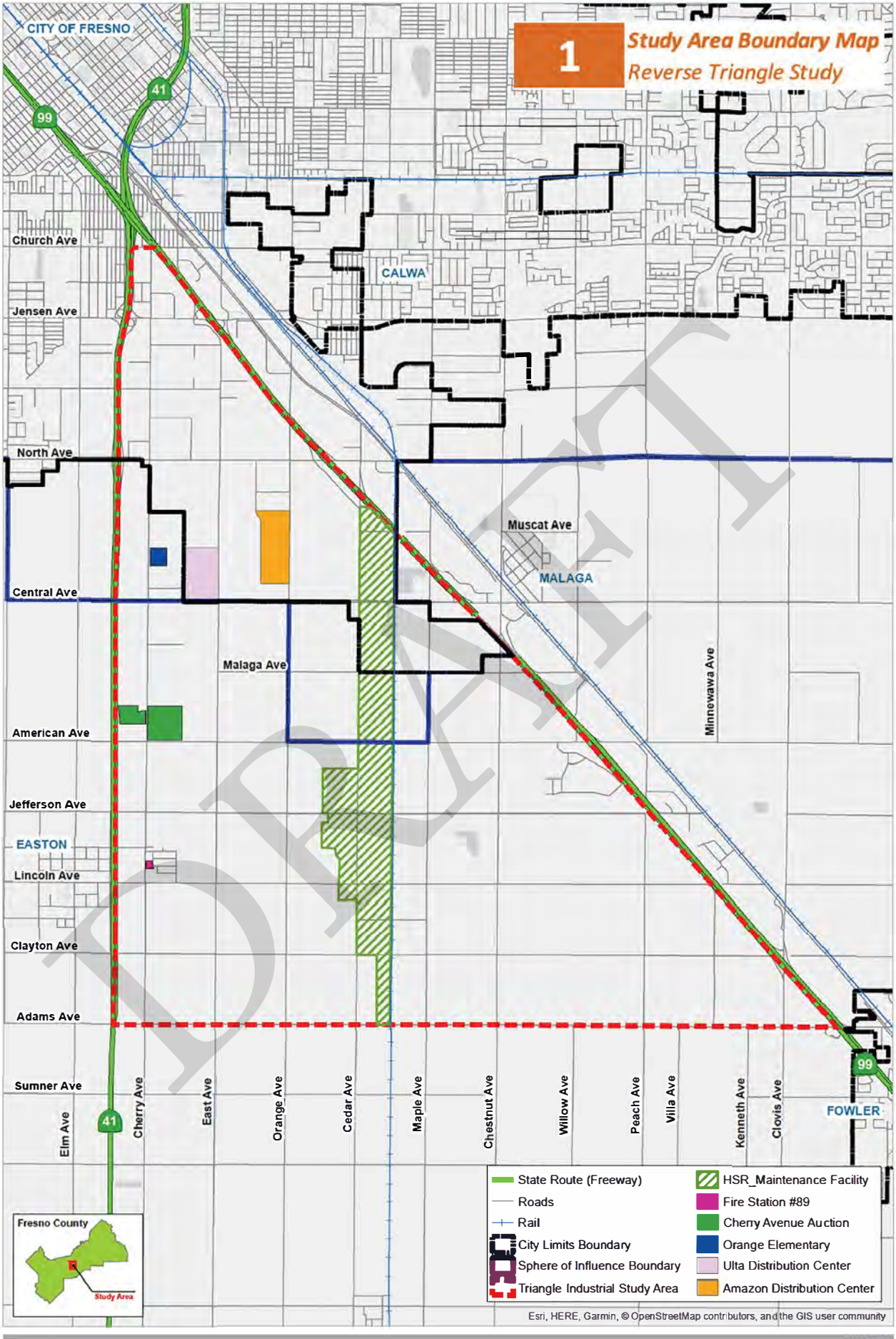
The Reverse Triangle Transportation Area (Study Area), located in the southern section of the City of Fresno (City) and northern unincorporated Fresno County (County), is a key industrial corridor that provides important employment opportunities. Yet the Study Area also remains partly rural, with farms and residential homes scattered throughout, particularly in the southern portion. In addition, residents from surrounding communities traverse the Study Area to reach schools or other destinations. **Figure 1** illustrates the boundaries of the Study Area.

Given the mix of uses located there, regional stakeholders are seeking to identify a set of transportation improvements that will enhance the overall functionality of the Study Area. At Fresno COG's request, New Economics & Advisory has analyzed the Study Area's role in the local economy. This evaluation consists of analysis of businesses, jobs and wages by sector; demographic research; assessment of the retail, office, and industrial real estate market; potential for additional local-serving retail; and, interviews with local business representatives and public stakeholders. This memorandum summarizes the results of this research and documents the underlying data sources and assumptions. In addition, this memo provides support for future grant writing efforts related to transportation projects. New Economics identified six economic indicators that are most often included in funding applications. For each indicator, this memo describes the funding source(s) that consider the indicator, the methodology that City/County/COG staff can use to estimate the Study Area's indicator value, and the current baseline value (if available).

Findings: Economic Setting

Overall Finding

Located at the southern edge of the City, the 14.6-square-mile Study Area includes portions of the City and unincorporated County. The Study 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 serving most of



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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

Paper Size ANSI B (portrait)

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

California's markets. In recent years, large new distribution centers have added jobs and activity to the area.

While the area within the City's existing boundary is largely developed, the portion south of Central Avenue remains mostly rural farmland and accompanying residential homes. Additional utility capacity may be needed to continue to increase the availability of shovel-ready industrial land there. Small clusters of suburban residential development are also scattered throughout the Study Area, nearly all located in the unincorporated County portion of the Study Area. Future transportation improvements could help leverage additional industrial development, catalyze complementary land uses (such as retail), and/or facilitate multi-modal transportation options benefitting local residents and workers.

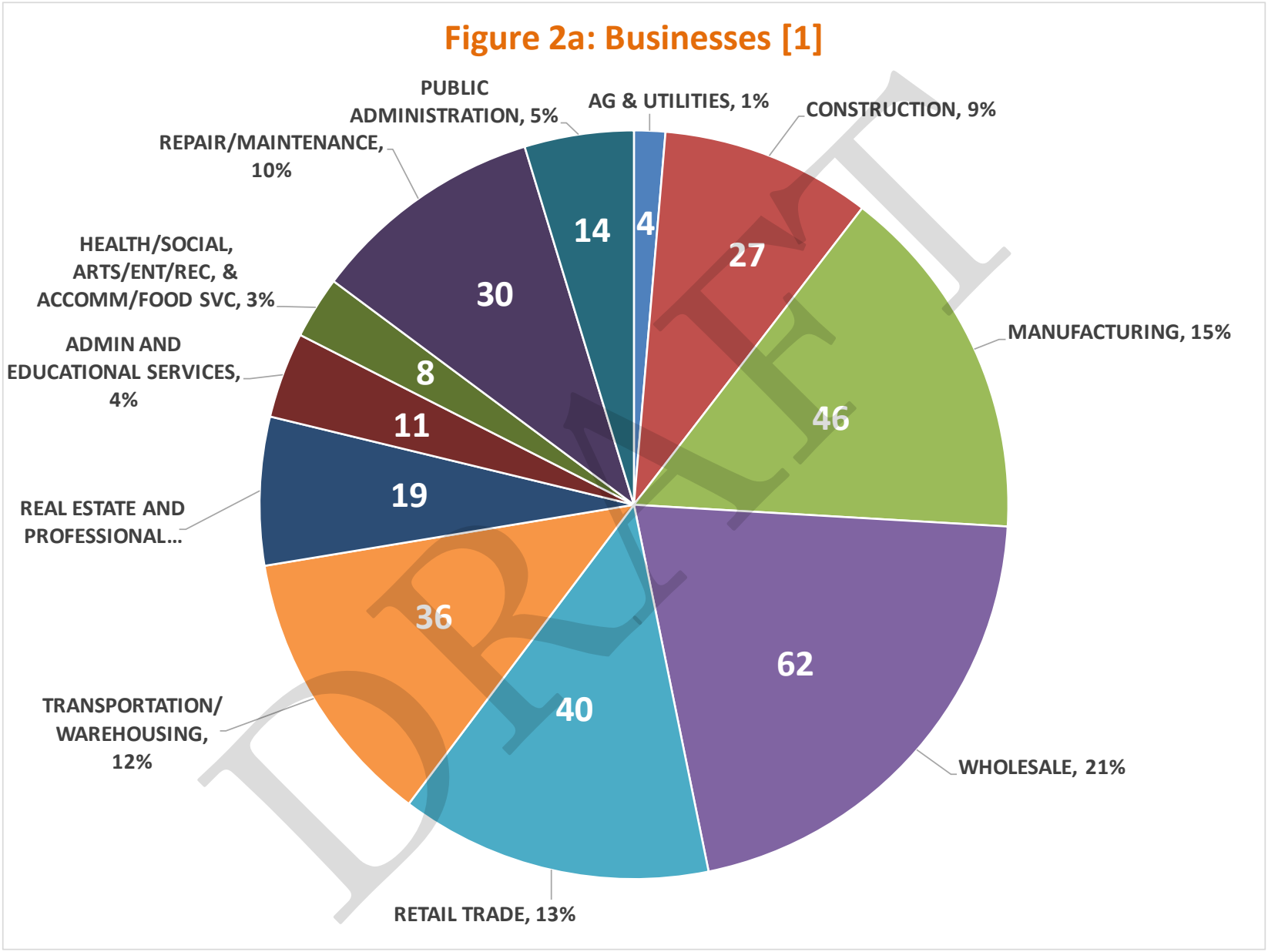
Individual Findings

Finding 1: There are nearly 300 businesses within the Study Area, including a large number of Manufacturing, Construction, Wholesale, and Transportation/Warehousing enterprises, as shown in Figures 2 (a & b) and 3 and Figure A-1 in Appendix A. Businesses in these industries tend to be spread across multiple sectors (instead of being concentrated in a particular sector of an industry). For example, Manufacturing companies include metal production, trucking, packaging, and printing products. There is a similar level of variation within the Construction and Wholesale industries. Within the Transportation/Warehousing industry, however, there is a large concentration of long-distance trucking freight businesses; the superior transportation access provided by the Reverse Triangle to many other areas of the state appears to be a major factor in choosing to locate these businesses in the Study Area.

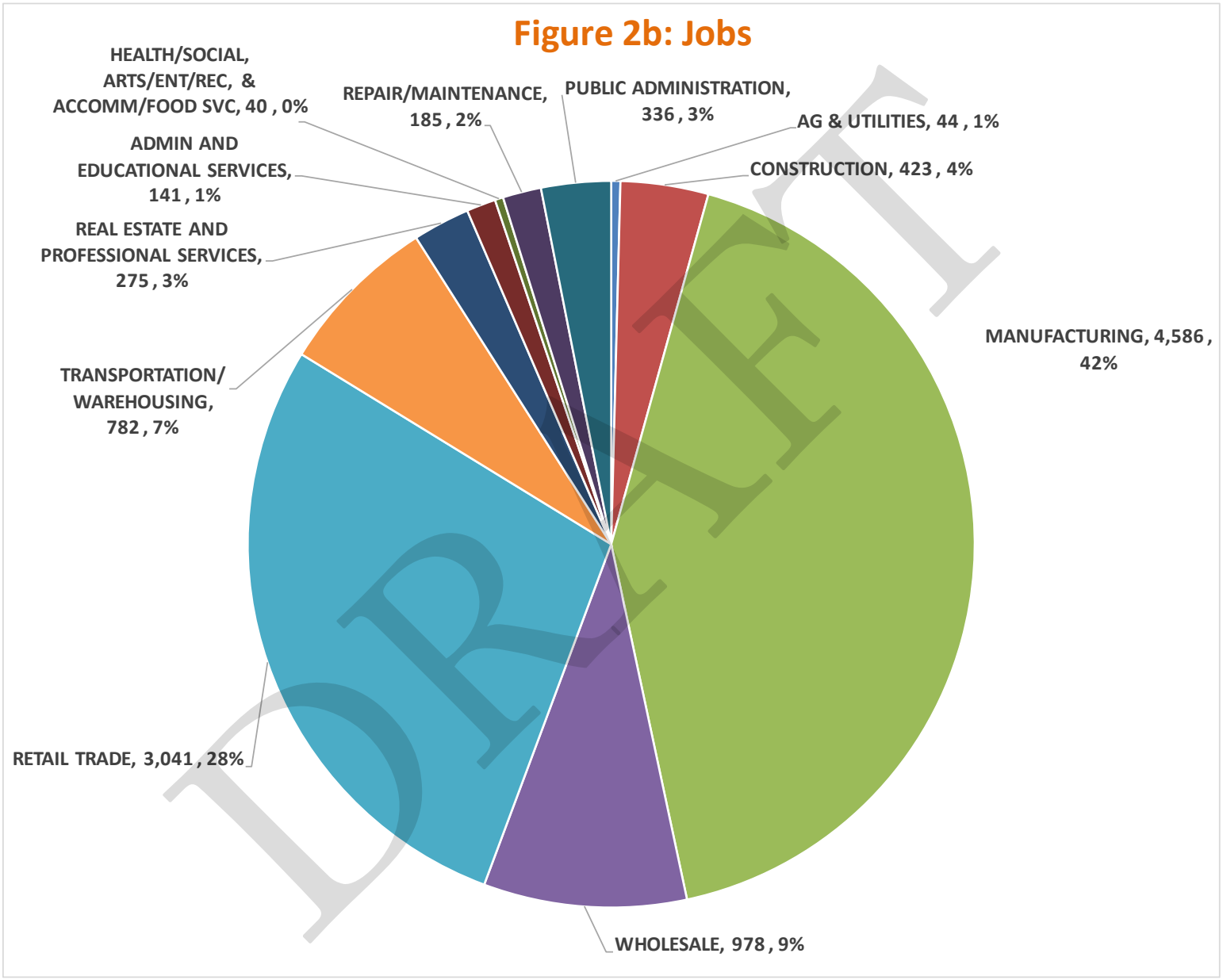
Finding 2: More than 40 percent of the Study Area's 11,000 jobs are concentrated in the Manufacturing industry, with Retail Trade providing another 28 percent of local jobs. Top employers include Taylor Communications (a printing company), Amazon and Ulta (retail distribution), and Mission Foods; these four companies alone account for more than half of Study Area jobs, as shown in **Figure 4**.

Finding 3: Wages for relatively common occupations in the Study Area can be less than, similar to, or higher than, the regional average wage ($44,600). Investments in transportation improvements could focus on benefitting sectors that tend to have occupations with higher wages, typically those that employ relatively high-skilled or specialized workers. Industry sectors that account for relatively high numbers of Study Area jobs (and comprise more than a single business) include Printing, Electronic Shopping, Specialized Freight Trucking, Recreational Vehicle Dealers, Metal Service Centers/Wholesalers, and Building Equipment Contractors. Sectors with higher ratios of skilled occupations, (e.g. managers, mechanics, electricians and plumbers) tend to pay wages that exceed the regional average. In contrast, sectors with lower skilled occupations (e.g. laborers, salespersons, non-emergency dispatchers, and production helpers) tend to pay relatively low wages. **Figure 5** summarizes the occupational characteristics of key industry sectors in the Study Area. **Figure A-2** in **Appendix A**

Figure 2a: Businesses [1]



[1] See Appendix A-1 for supporting information.
Source: Reference USA, New Economics & Advisory.



[1] See Appendix A-1 for supporting information.
Source: Reference USA, New Economics & Advisory.

3 Businesses by Industry Sector
Reverse Triangle Study

Item	Manufacturing	Construction	Wholesale	Transportation
Number of Businesses	46	27	62	36
Number of Sectors	32	12	25	7

Source: RefUSA, 2019.

Prepared by New Economics & Advisory, October 2020.

4 To 10 Employers
Reverse Triangle Study

Business	# of Employees	% of Total Jobs
Top 10 Employers		
Taylor Communications	3,600	33%
Amazon [1]	1,500	14%
Ulta [1]	540	5%
Gruma Corp (Mission Foods)	350	3%
First Student Inc (Transp.)	270	2%
New England Sheet Metal	200	2%
Paul Evert's RV Country	160	1%
Valley Iron Inc	150	1%
California Highway Patrol	145	1%
Scelzi Enterprises Inc	130	1%
Subtotal Top 10 Employers	**7,045**	**65%**
Other Jobs	3,786	35%
Total Jobs	**10,831**	**100%**

[1] Estimated full-time workers estimated in "Amazon's not the only warehouse hiring in Fresno" by Tim Sheehan, May 9, 2018, Fresno Bee. Accessed from fresnobee.com, 06.11.2019.

Source: Reference USA, 2019 unless otherwise noted.

Prepared by New Economics & Advisory, October 2020.

5 Summary of Study Area Occupations and Wages
Reverse Triangle Study

NAICS Sector	Mean Annual Wage (2016)	Jobs (2019)
Printing (NAICS 323000)	$29,533	3,642
Electronic Shopping (NAICS 454100)	$34,937	2,040 [1]
Specialized Freight Trucking (NAICS 484200)	$41,091	437
Fresno County MSA Mean Wage (All Industries)	**$44,625**	**N/A**
Recreational Vehicle Dealers (NAICS 441200)	$44,690	206
Metal Service Ctrs Wholesalers (NAICS 423500)	$49,831	192
Plumbing Htg & Air-Conditioning Contractors (NAICS 238220)	$51,154	211
Machinery, Equipment, and Supplies Merchant Wholesalers (NAICS Code 423800)	$67,501	159

[1] Includes cosmetics because New Economics was able to confirm the nature of that business, which has more in common with an electronic mail order house.
Source: EDD website, www.labormarketinfo.edd.ca.gov, accessed October, 2019; 2016 Wages by Occupation for Fresno MSA Occupations; 2016 BLS Occupations by Industry for California.
Prepared by New Economics & Advisory, October 2020.

provides a more detailed look at occupations and wages in the Fresno Metropolitan Statistical Area (MSA). The City, County, and COG may want to prioritize infrastructure investments that would benefit and/or attract businesses in the Machinery Wholesalers and Building Equipment industries, which have the most potential to create relatively higher paying jobs.

Finding 4: Only one percent of Study Area jobs are held by Study Area residents. Commute pattern data shows that about half of workers live within a 20-minute drive, and stakeholder interviews indicate that most workers rely on personal vehicles to reach their jobs in the Study Area. Commute data indicates that approximately 99 percent of Study Area employees live outside of the Study Area, while another 7 percent live within a 25-45 minute drive, as shown in **Figure 6**. Less than 100 residents living in the Study Area work in the Study Area. The top three cities where residents work are the City of Fresno (36 percent), Fowler (4 percent), and Clovis (4 percent). The remaining 56 percent is broken up across several other cities.

Finding 5: The Study Area has approximately 10.1 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, as shown in **Figure 7**. Class B space accounts for almost 30 percent of Study 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 Study Area—these spaces are classified as Distribution (75 percent) or Warehouse (25 percent) and were built in 2008 or 2018.

Finding 6: In recent years, the Study Area has experienced significant growth and improvement in the industrial sub-market. Since 2010, the Study 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 Study Area experienced several prominent industrial leases and sales, including 30 lease agreements and four property sales; these transactions accounted for nearly half of all industrial leasing and sales transactions, respectively, in the Region.

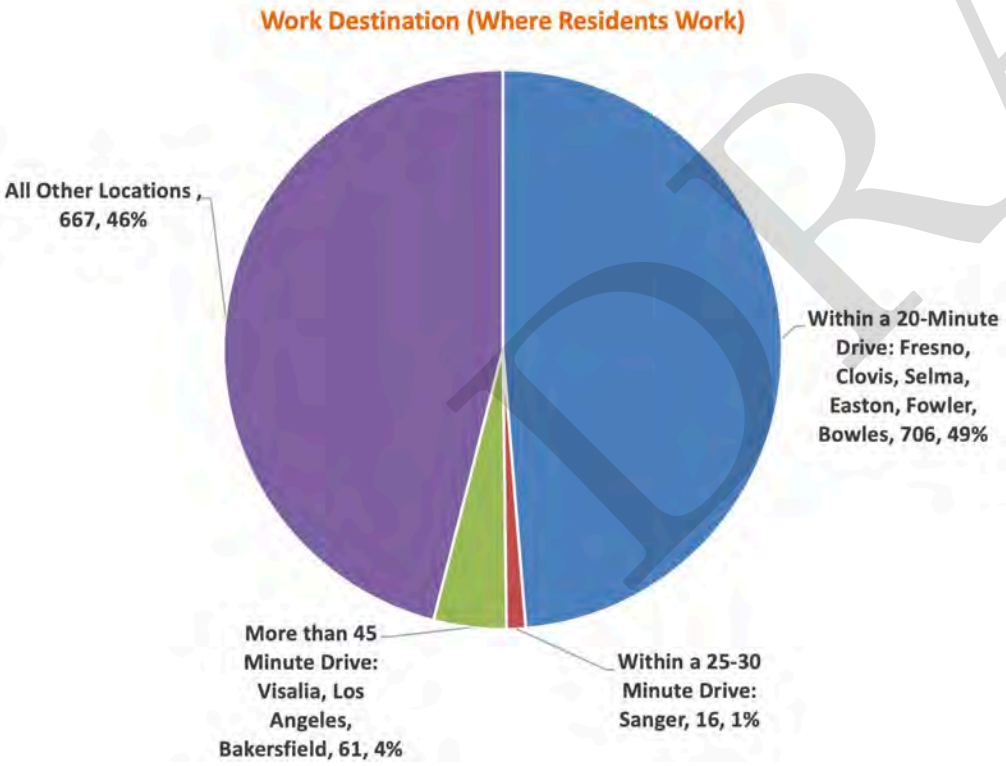
Finding 7: While the Study Area remains an ideal location for industrial development, additional new industrial development appears to be on hold in the near-term and the Study Area may experience increased competition from other sub-markets. At this time, there are no proposed development projects in the County portion of the Study Area. According to interviews with local stakeholders, additional infrastructure investment, particularly at Highway 99 and the railroad tracks crossing North Avenue east of the Study Area, would be needed to accommodate the next wave of industrial development. In the meantime, new development may be more attracted to areas that

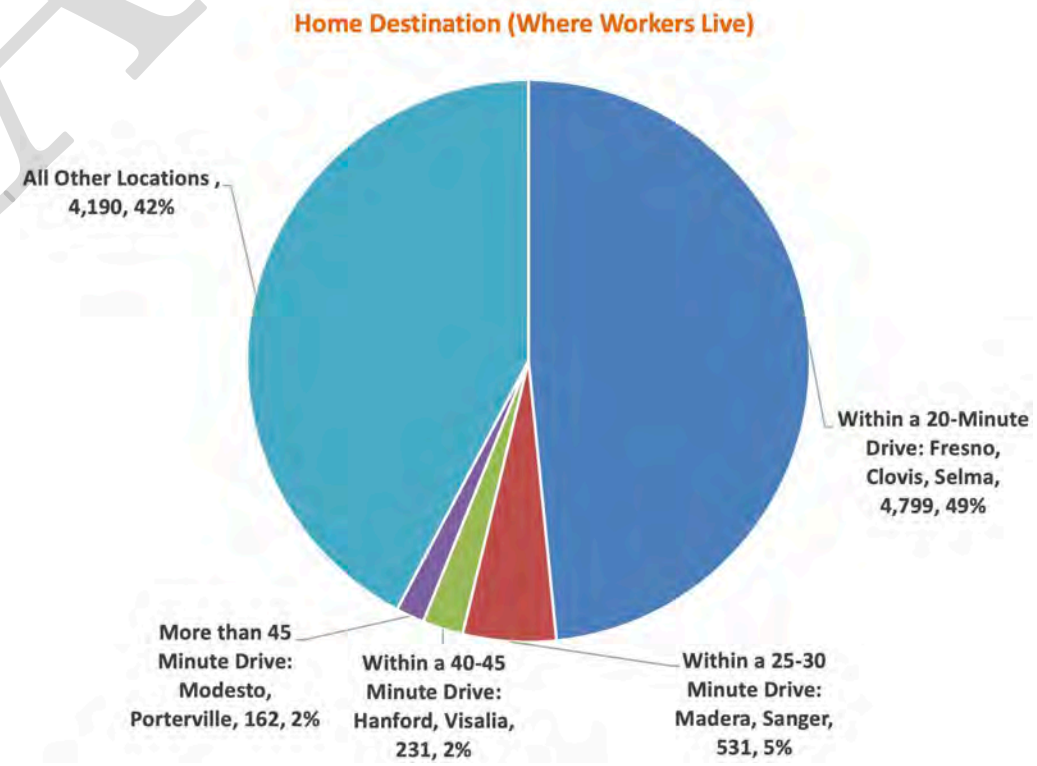
6 Commute Trends
2017

Item	Count	% of Total
Employed in the Study Area	9,913	100%
Employed in the Study Area but Living Outside the Project Area	9,828	99%
Employed and Living in the Study Area	85	1%

Source: US Census Bureau LED/LEHD On the Map Application, accessed October 2019.

Prepared by New Economics & Advisory, October 2020.





7 ***Industrial Space by Class: Study Area (2018)***
Reverse Triangle Study

Class	Rentable Space Amt.	Rentable Space %	Buildings	Avg. Bldg. Size [1]	Warehouse Amt.	Warehouse % of Rentable Space	Distribution Amt.	Distribution % of Rentable Space	Manufacturing Amt.	Manufacturing % of Rentable Space	Service Amt.	Service % of Rentable Space	Truck Terminal Amt.	Truck Terminal % of Rentable Space	Other Amt.	Other % of Rentable Space
A	2,402,162	24%	8	300,270	599,036	25%	1,803,126	75%	0	0%	0	0%	0	0%	0	0%
B	2,787,687	28%	46	60,602	554,295	20%	1,184,464	42%	39,000	1%	39,735	1%	39,735	1%	930,458	33%
C	4,945,499	49%	146	33,873	2,359,326	48%	519,313	11%	316,327	6%	1,382,637	28%	116,813	2%	251,083	5%
Total	**10,135,348**	**100%**	**200**		**3,512,657**	**35%**	**3,506,903**	**35%**	**355,327**	**4%**	**1,422,372**	**14%**	**156,548**	**2%**	**1,181,541**	**12%**

[1] Amount reflects an unweighted average.
Source: Costar, 2019.
Prepared by New Economics & Advisory, October 2020.

have large, shovel-ready industrial tracts that can more easily accommodate new industrial development, such as Visalia.

Finding 8: The Study Area also has a small residential community with approximately 3,600 people and 1,200 residential units, as shown in Figures A-3 and A-4 in Appendix A. These units are largely clustered into small subdivisions within the unincorporated County. Only one subdivision is located in the existing City, north of Jensen Avenue (backing onto Highway 41). Other clusters include:

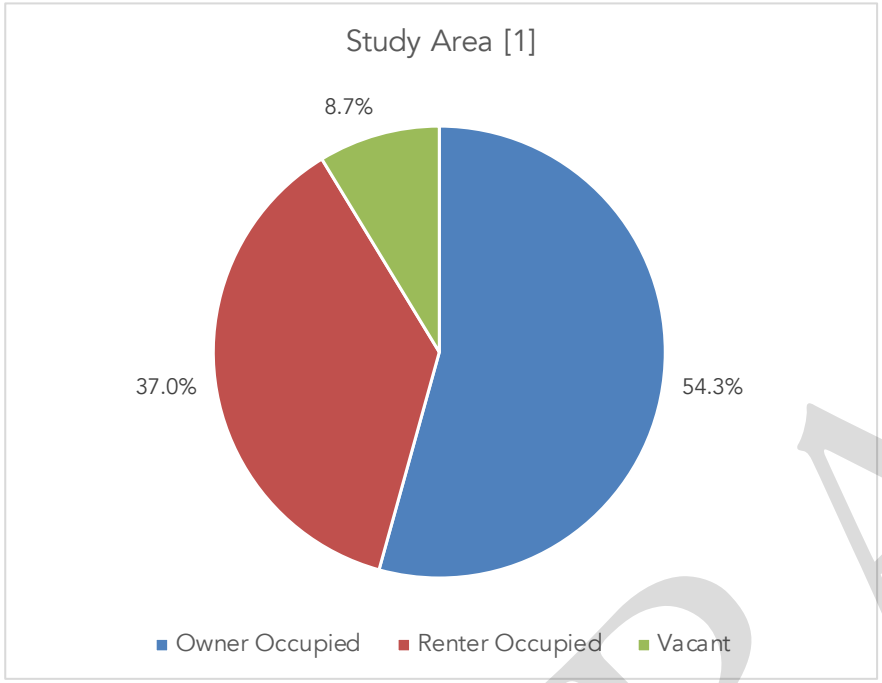
- a 40-unit trailer park near Central and Highway 99
- about 40 units south of Orange Center Elementary School at Central and S. Cherry;
- about 100+ units surrounding Fresno County Station 89 near Lincoln Avenue and S Cherry;
- larger lot homes in the vicinity of E Clayton and S Cherry
- 50+ units near E Jefferson and S Chestnut (possibly trailer homes and some permanent home structures)
- 20+ units at S Cherry and E Britten Avenue

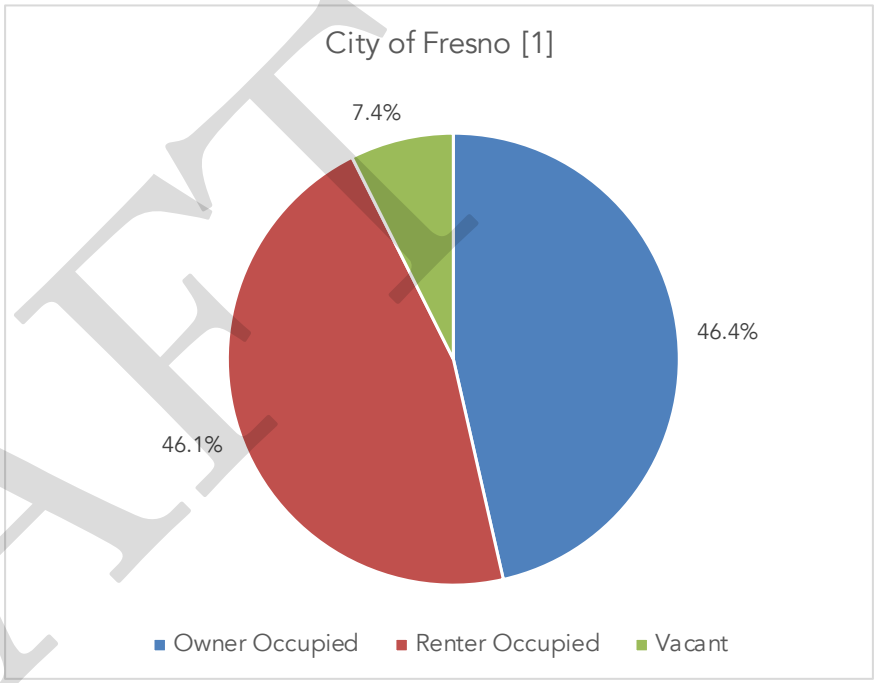
Also, while relatively few in number, Study Area residences are predominantly single-family homes and enjoy a high rate of homeownership. Whereas 46 percent of Fresno's housing units are owned, nearly 55 percent of homes in the Study Area are owned (**Figure 8**). These units are scattered throughout the Study Area, with some concentrated in small suburban subdivisions, while others are homes located on farm properties.

Finding 9: As a whole, the residential 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 (Figure 9). The Study 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 10: The lack of traditional retail and office development in the Study Area is consistent with the relatively small number and dispersed nature of residents, yet it also prevents residents and workers from being able to access local-serving commercial. Local population drives demand for local-serving brick-and-mortar retail and office space. The Study 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.

8 ***Housing Occupancy: Study Area vs. City of Fresno***
Reverse Triangle Study

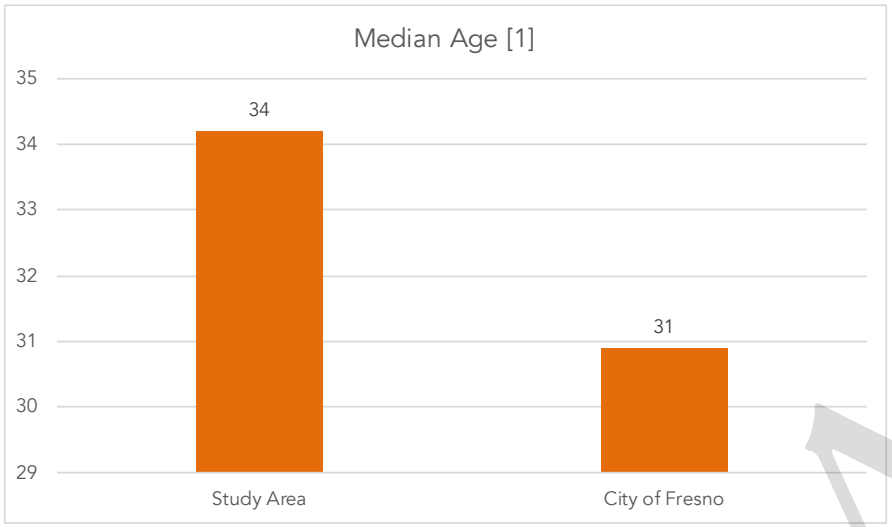


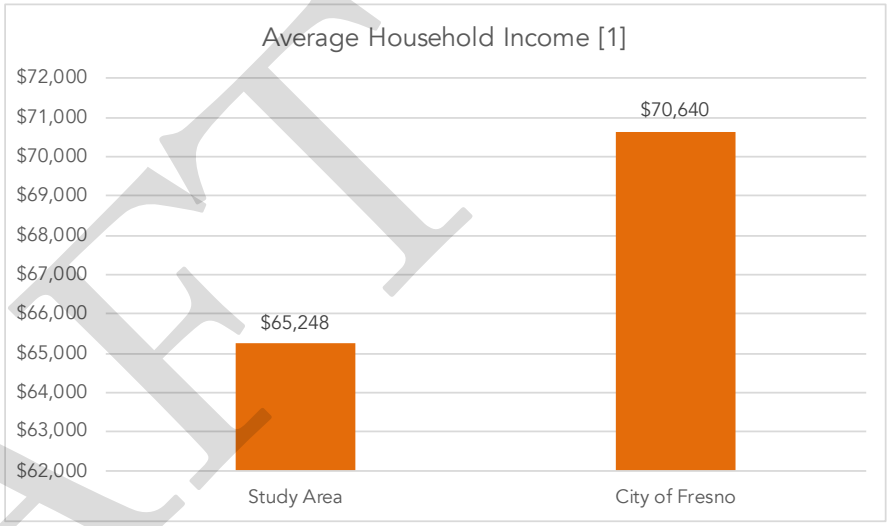


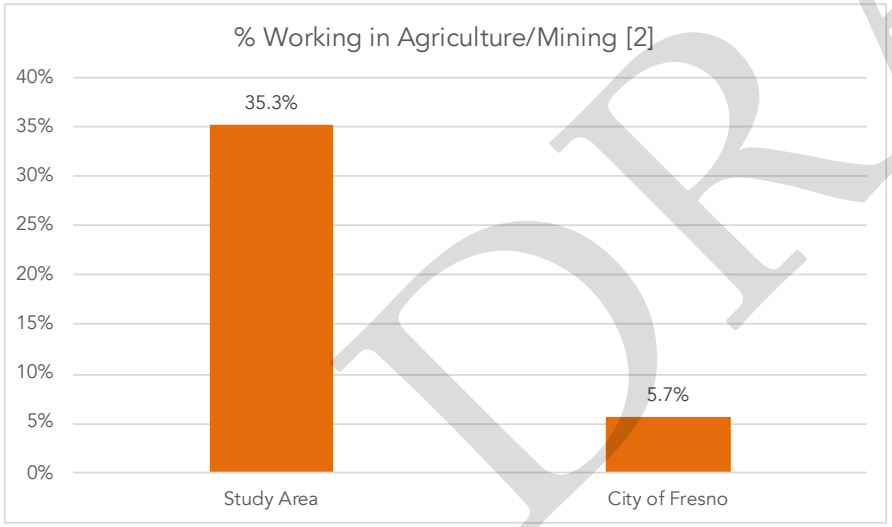
[1] See Appendix A-5 for supporting information.
Source: ESRI, 2019.

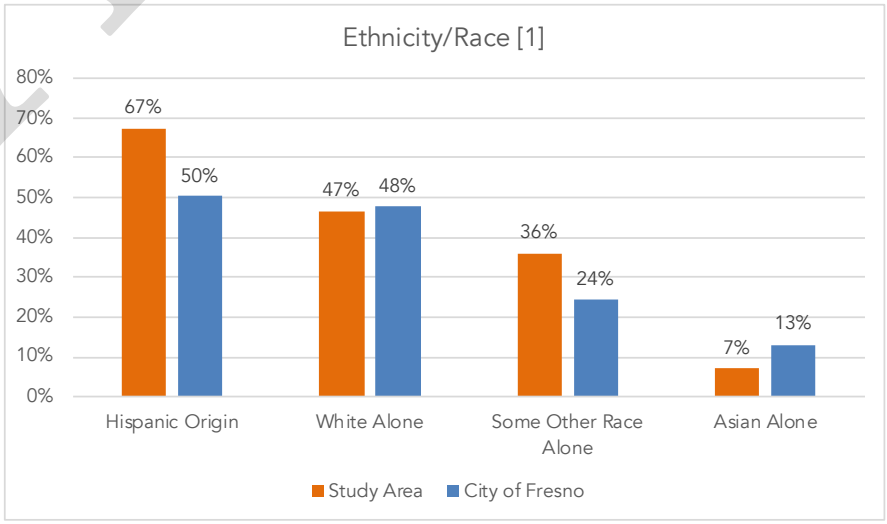
9 *Demographic Breakdown: Study Area vs. City of Fresno*

Reverse Triangle Study









[1] See Appendix A-3 for supporting information.
[2] See Appendix A-4 for supporting information.
Source: ESRI, 2019.

Within the Study Area itself, there is approximately 15,000 square feet of local-serving retail, mostly characterized as convenience markets and small restaurants/fast food. **Figure 10** denotes the location of local-serving retail spaces. The Study Area is lacking in pharmacies, personal services (such as banks, salons, etc.), hardware stores, and other local-serving retailers. While these types of stores exist in nearby Malaga, Easton, and Calwa, Study Area residents must travel at least 3 miles and traverse at least one highway to reach them (**Figure 11**). The combination of distance and route makes it difficult to choose a travel mode other than auto.

Business interviews also indicated that workers mostly bring their lunch because it takes too long to drive to and from lunch spots. Transportation improvements that make commercially-zoned land more accessible could incentivize new, local-serving retail development. Potential areas for the near-term consideration include:

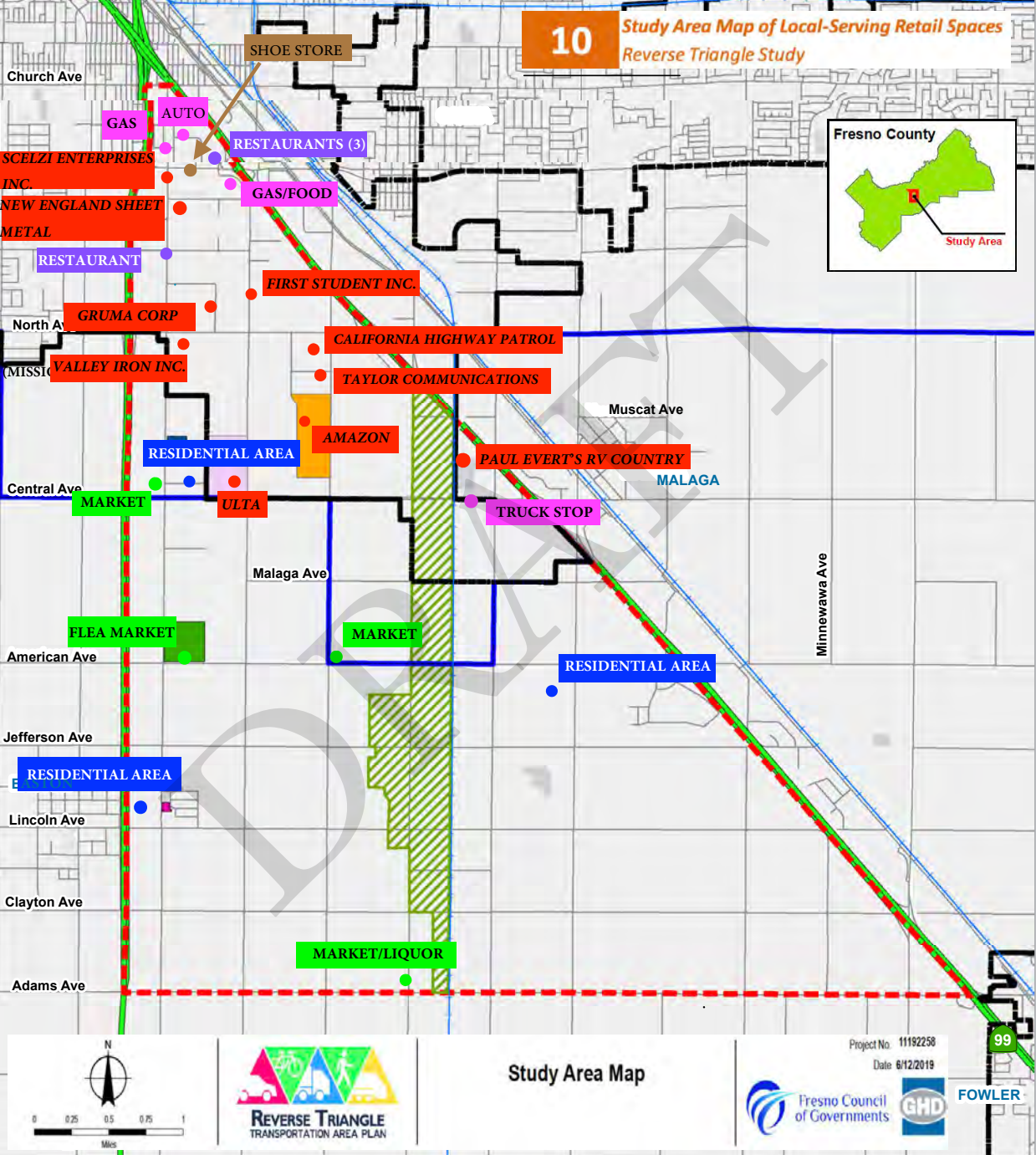
- **Multi-modal connectivity to and along Jensen Avenue.** There is a concentration of large and small employers fronting Jensen and North, as well as a freeway stop area just outside the Study Area east of Highway 99. Additional multi-modal connectivity along North Avenue, Jensen Avenue, East Avenue, and the streets leading between these arterials could help facilitate pedestrian and/or bicycle access to existing retailers.
- **Connectivity to and Along Central Avenue.** The western portion of Central Avenue has both a residential community and market (near Cherry Avenue), while the middle stretch passes close to Amazon, and the eastern portion connects to a truck stop and a freeway entrance/exit. To the extent that Central Avenue experiences more business and/or residential development, it would also be a more desirable location for additional retail venues.

Grant Writing Support: Economic Indicators

Once the investment strategy is finalized, FCOG, the City, and/or County will begin to seek outside funding to help cover the cost of transportation investments in the Study Area. Funding applications typically will include economic cost-benefit studies, demographics, and a variety of economic indicators.

Townsend identified a variety of competitive federal, state, and regional grant funding sources for transportation improvement projects in the Study Area, including but not limited to:

- Rural Development Area (USDA)
- Active Transportation Program (ATP) [California Transportation Commission (CTC) and Fresno COG]
- Recreational Trails (California Department of Parks and Recreation)
- EEM Program (California Natural Resources Agency)
- Highway Safety Improvement Program [HSIP] (US DOT FHWA)
- Transportation Planning Grant Program (Caltrans)
- Congestion Mitigation and Air Quality [CMAQ] (Fresno COG)
- SB 1 funds (CTC)


10
Study Area Map of Local-Serving Retail Spaces
Reverse Triangle Study
Fresno County
Study Area
SHOE STORE
Church Ave
GAS
AUTO
RESTAURANTS (3)
SCELZI ENTERPRISES INC.
GAS/FOOD
NEW ENGLAND SHEET METAL
RESTAURANT
FIRST STUDENT INC.
GRUMA CORP
North Ave
CALIFORNIA HIGHWAY PATROL
VALLEY IRON INC.
TAYLOR COMMUNICATIONS
Muscat Ave
AMAZON
RESIDENTIAL AREA
PAUL EVERT'S RV COUNTRY
MALAGA
Central Ave
MARKET
ULTA
TRUCK STOP
Malaga Ave
Minnewawa Ave
FLEA MARKET
MARKET
American Ave
RESIDENTIAL AREA
Jefferson Ave
RESIDENTIAL AREA
Lincoln Ave
Clayton Ave
MARKET/LIQUOR
Adams Ave
99
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
FOWLER
DRAFT

11 *Support for Additional Local-Serving Retail (Study Area)*

Reverse Triangle Study

Item	Fresno Per Person	Fresno Total	Study Area Per Person	Study Area Total
Population		536,683 [1]		3,629 [1]
Occupied Retail Space (2020)				*Projected*
Neighborhood Retail	13	6,742,151	13	45,590
Strip Retail	3	1,642,285	3	11,105
Total Local-Serving Retail Space		**8,384,436**		**56,695**
Existing Study Area Retail Space (Sq. Ft.)				*Estimated [2]*
Adam's Market & Liquor				1,980
Cherry Market				1,280
AMPM/ARCO				2,500
Flyers (Mobil Gas Station)				1,125
All Country Work Boots				1,500
Malaga Market				3,000
Casa Rosas Restaurant				1,500
Deli Delicious/Robertito's Taco Shop				1,000
SUBWAY				1,000
Total Existing Local-Serving Retai				**14,885**
Remaining Potential Local-Serving Retail				41,810

Underserved Retail Categories	**pharmacy, personal services (banks, salons, beauty supply), hardware, etc.**	
		Miles Away
Closest pharmacy	Malaga	4.6
Closest bank with financial services	South Fresno	3.9
Closest hair salon	Calwa, Easton	2.8-4.0

[1] Fresno population from 2019. Study Area population from 2018.

[2] Estimated by New Economics based on Google Maps view of parcels.

Sources: Reference USA, CoStar, Google Maps, and New Economics & Advisory, Inc.

Prepared by New Economics & Advisory, October 2020.

- California Climate Investments [CCI] and Affordable Housing and Sustainable Community Program [AHSC] (HCD)

To help support future grant funding efforts, New Economics reviewed the most recent, publicly-available funding program guidelines (mostly 2018-2019 funding releases) to identify a set of demographic/economic indicators needed to compete for funds. **Figure 12** summarizes the review of major potential funding sources and any pertinent demographic/economic metrics. Based on this review and an understanding of other competitive grant programs, New Economics has identified the following economic indicators:

1. Key demographics for the Study Area: median household income, number of residents, poverty, race, age, spoken language, cultural characteristics, vehicle ownership, etc.
2. Estimated number of Study Area jobs
3. Wages for Study Area jobs
4. Commute time for Study Area residents and workers
5. Disadvantaged Community Status: Housing and Transportation Affordability Index, Cal Enviro Screen
6. Economic Development Policies: anti-displacement strategies, workforce development and hiring practices

For each indicator, this memo provides an explanation of the purpose of the indicator, a current value, methods to update or establish the indicator in the future, costs to procure the data, and any limitations to the data.

Indicator #1: Key Demographics

Demographic characteristics of a project area help define the range of benefit that a transportation project can provide and also influence transportation needs, challenges, and solutions. A narrative about the Study Area generally focuses on the residents of the local community. This type of narrative can be especially useful in applying for Sustainable Communities Grants administered by Caltrans, as part of a Community Needs Assessment.

Current Study Area Demographics

A narrative example describing current Study Area demographics might be something to the effect of:

The Study Area is a well-established and active industrial node for the Fresno Region. With over 300 businesses and 11,000 jobs, distribution, manufacturing, and other logistics companies continue to be attracted by the area's transportation corridors, which provide access to the Sacramento Region, SF Bay Area, Central Valley, and Southern California.

While the Study Area is largely industrial in nature, there is a small residential community with approximately 3,600 people and 1,200 residential units. These units are

12 *Funding Sources and Demographic/Economic Metrics*

Reverse Triangle Study

Funding Source	Metric 1	Metric 2	Source(s)	Comments
USDA Community Facilities Grant	# of community residents	Median household income	https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-	Baseline for hh income is "state nonmetropolitan median household
California Dapartment of Housing and Community Development-Affordable Housing and Sustainable Communities Program (AHSC) (Based on 2018-2019 guidelines)	Anti-displacement strategies (for businesses)	Local workforce development and hiring practices	http://sgc.ca.gov/programs/ahsc/resources/	Round 5 Guidelines: http://sgc.ca.gov/programs/ahsc/docs/20191209-FINAL_AHSC_Round_5_FY18-19_Guidelines_Amended_12.9.19.pdf
Caltrans Active Transportation Grant (ATP) [Includes direct statewide and Fresno COG programs]	Disadvantaged community benefit	Median household income	https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/active-transportation-program AND https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/active-transportation-program/cycle5	Several ways to potentially qualify as disadvantaged community.
Caltrans Transportation Planning Grants (Sustainable Communities Grants, Strategic Partnership Grants, Strategic Partnership--Transit Grants)	Disadvantage community status (Sustainable Communities grants only)	Community Needs Assessment demographics (Sustainable Communities grants only): population, race, age, poverty, housing and transp.affordability index, Cal Enviro Screen score, job losses, etc.	https://dot.ca.gov/programs/transportation-planning/regional-planning/sustainable-transportation-planning-grants	2021/2022 Grant application materials not yet available. Last set of application materials dates back to 2019.
California Department of Parks and Recreation Recreational Trails Program (Based on 2019 guidelines)	Number of projected users	Linkages to population centers or gathering centers (greater consideration for linkages between schools, homes, workplaces, campgrounds, resorts)	https://www.parks.ca.gov/?page_id=24324	Grant cycle is currently suspended. Used 2007 Procedural Guide (which was used for the 2019 grant cycle). Note: grant only funds 88% of project costs.
Caltrans HSIP (based on 2018 NOFA)	N/A	N/A	https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program/apply-now	Criteria primarily tried to safety (crashes, fatalities, injuries); Benefit Cost Ratio (BCR) may be needed but would utilized the HSIP analyzer template.
CMAQ (Regional Bid) (Based on 2019 NOFA)	N/A	N/A	https://www.fresnocog.org/project/congestion-mitigation-air-quality-cmaq-program/	No demographic/economic indicators included in scoring criteria.
California Natural Resources Agency Environmental Enhancement and Mitigation Program (EEM) (Based on 2019 guidelines)	N/A	N/A	https://resources.ca.gov/grants/environmental-enhancement-and-mitigation-eem/	Grant cycle is currently suspended.

Source: New Economics & Advisory, various funding program sources.
Prepared by New Economics & Advisory, October 2020.

largely clustered into small subdivisions within the unincorporated County, although some can be characterized as farm homes. Residences are predominantly single-family homes and enjoy a high rate of homeownership.

As a whole, the residential community is slightly older, more diverse, and earns lower incomes than the nearby City of Fresno, although Study Area residents are more likely to be employed. Compared to Fresno, the Study 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).

Owing to its small population and dispersed land use patterns, the community lacks traditional retail and office development. Located between two rural communities—Malaga (with a population of about 1,000) and Easton (with a population of about 2,000)—Study Area residents must travel at least 3 miles and traverse at least one highway to reach them to access most local retail and services, including pharmacies, banks, salons, etc. Community and regional retail stores and services are even farther away. The combination of distance and route makes it difficult to choose a travel mode other than auto.

Figure A-3 in **Appendix A** contains current demographic statistics that could be used to refine this example narrative.

Future Updates to Study Area Demographics: 2 Options

The Study Area is located within the following census tracts:

- Tract 11 (portion)
- Tract 15 (very small portion)
- Tract 17 (portion)
- Tract 18 (portion)

At the time this memo was prepared, the 2020 Census was underway. Should the City, County, or FCOG wish to pursue grant funding before 2020 Census data is available, or in the intervening years prior to the 2030 Census, the following sources could be of use:

- American Community Survey. A national survey that is conducted annually and administered to subsets of the U.S. population. Data generated from the survey is used by the U.S. Census Bureau to estimate current and future demographics, and topics include (but are not limited to) population, housing, income, and occupation (https://www.census.gov/programs-surveys/acs). Block groups are the smallest geography that can be analyzed using American Community Survey data.
- Economic Census. Economic data collected by the U.S. Census Bureau every five years. Topics include (but are not limited to) workforce density, business activity, total revenue generated (https://www.census.gov/programs-surveys/economic-

census.html). Economic places are the smallest geography that can be analyzed using Economic Census data.

- ESRI. A private, third-party data provider, ESRI extrapolates data from the last decennial census and other Census surveys to estimate current and future demographics. The use of ESRI requires an annual subscription (https://bao.arcgis.com/esriBAO/index.html). ESRI allows for custom geographic areas that can be uploaded (e.g. shapefiles) or hand-drawn on screen.

Indicator #2: Estimated Study Area Jobs

Jobs are a primary indicator of economic health and prosperity. The ability for a transportation improvement project to facilitate an increase in the number of jobs is an important predictor of project success.

Current Study Area Jobs Count

Finding 2 describes the estimated number of jobs in the Study Area in 2019. This estimate was the result of a multi-step process that consisted of geocoding third-party, private data (Reference USA) to determine the number of jobs physically located within the Study Area. **Appendix B** contains the exact methodology to estimate using this approach.

Future Updates to Study Area Jobs: 4 Options

The first option would be to update Study Area Jobs based on Reference USA jobs data and undertaking a geocoding effort. As of 2019, costs to obtain this data would include a subscription to Reference USA (approximately $5,000) and staff or consultant time to geocode this data. Reference USA allows unlimited downloading up to 25,000 record blocks. Downloads thereafter are $0.12 per download.

A second option to estimate Study Area jobs is to commission a custom jobs report prepared by the California Employment Development Department (EDD). California EDD tracks jobs with wages on a monthly, quarterly, and annual basis at the 6-digit NAICS level. EDD produces two data sets under contract to the Bureau of Labor Statistics: Current Employment Statistics (CES) data and Quarterly Census of Employment and Wages (QCEW) data. EDD job count estimates are typically lower than other estimates because they include only those who have unemployment insurance; proprietors, unincorporated self-employed, unpaid volunteer or family employees, farm employees, domestic employees, and military personnel are not accounted for in the CES estimates. Job counts are based on samples from the Bureau of Labor Statistics (BLS) Longitudinal Database, which includes all establishments covered by unemployment insurance; government jobs are subsequently added in separately. EDD charges for a custom report, which would be required for the Study Area because it is a smaller and different geographic area than a county, which is the standard boundary studied by EDD. Actual charges and timing will depend on the specifics of the request. Costs could be in the range of $500 or more and could take 1 month or longer. More

information about customized reports can be found here:
https://www.labormarketinfo.edd.ca.gov/resources/lmi-custom-data-services.html

A third option would be to provide larger area job counts. The Bureau of Labor Statistics' Western Information Office provides job estimates on a monthly basis for the Fresno Metropolitan Statistical Area (Fresno MSA):
https://www.bls.gov/regions/west/ca_fresno_msa.htm

A fourth option would be to use the American Community Survey (ACS), which is provided by the Census, to estimate jobs at the city-level. The ACS is a national survey that uses a 5-year estimate to create data profiles of geographical areas including cities. The ACS uses a series of monthly samples to estimate updated annual data. Information provided by the survey at the city-level includes occupation by industry counts. These estimates are free and are readily available on the ACS website.

https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/

Estimating Additional Jobs Created by a Transportation Improvement Project

Major transportation improvement projects can stimulate new development, including residential and non-residential projects. Non-residential development can occur on a speculative or build-to-suit basis. To the extent that a project will open up development in an area that was otherwise considered infeasible or inaccessible for development, a projection about new jobs can be made.

Figure 13 provides a series of planning-level rules of thumb that can be used to make a preliminary estimate of jobs facilitated by the transportation project. Each line item can be refined based on local, specific conditions.

Indicator #3: Study Area Wages

Wages provide an indication of the portion of pay that will ripple into the local economy, both from on-site workers who make expenditures during their daily shift and commute and from on-site workers who will in the community and will make additional expenditures on evenings and weekends.

Current Study Area Wages

Finding 1 identifies the top five industries in the Study Area and ***Finding 3*** posits that the mean annual wages in these industries are higher than the mean annual wage of the Fresno County MSA. The calculation for this comparison can be seen in **Figure 5.**

Future Updates to Study Area Wages: Two Options

The first option would be to update Study Area wages based on California Employment Development Department (California EDD) wage data. New Economics gathered wage information for the five industries with the largest number of employees in the Study Area, using the methodology described in **Appendix B** and relying on these data sources:

https://www.labormarketinfo.edd.ca.gov/iomatrix/IndList.asp#R2

13 *Estimating New Jobs Facilitated by Transportation Investment*

Reverse Triangle Study

Real Estate Sector	Industrial (Manufacturing)	Industrial (Warehouse)	Office	Retail	Source(s)	Potential Refinements
	YTD 2019					
Industrial/Flex Market						
Acres Opened Up For Development by Transportation Project	25	25	50	50	Hypothetical Example	Staff to identify acres (by zoning) opened up for new development.
Land Sq. Ft. Opened Up for	1,089,000	1,089,000	2,178,000	2,178,000		
Gross to Net Factor (net out interior streets, drainage)	90%	90%	90%	90%	Industry standard estimate	Should reflect gross-to-net factors in Study Area
Floor-Area-Ratio (FAR)	1.5	1.5	1.25	0.75	Reflects current City/County zoning code.	Should reflect specific FARs in Study Area
Estimated Gross Building Sq. Ft.	1,470,150	1,470,150	2,450,250	1,470,150		
Occupancy Rate When Stable	93%	93%	100%	100%	Reflects 2019 rates	Should be reflective of local occupancy rates
Occupied Building Sq. Ft.	1,359,889	1,359,889	2,450,250	1,470,150		
Sq. Ft. Per Employee	500	1,400	300	500	ITE and US Dept of Energy, 2008.	Industrial can range from 700 (R&D) - 3,000+ (Warehouse) sq. ft. per employee, depending on nature of use. Office ranges from 175-250 sq. ft. per employee, depending on type. Retail can vary from 70 (fast food with drive thru) to 1,000+ (hardware store), depending
Estimated Employees	2,720	971	8,168	2,940		

Source: New Economics & Advisory, City/County Zoning Ordinances

Prepared by New Economics & Advisory, October 2020.

https://www.labormarketinfo.edd.ca.gov/data/oes-employment-and-wages.html.

A second option to estimate Study Area wages is a custom jobs report prepared by the California Employment Development Department (EDD). California EDD tracks jobs with gross wages on a monthly, quarterly, and annual basis at the 6-digit NAICS level. By taking the total gross wages in a specific NAICS code and dividing it by the total jobs in that NAICS code, you could estimate the wage per job at a NAICS code level. EDD produces two data sets under contract to the Bureau of Labor Statistics: Current Employment Statistics (CES) data and Quarterly Census of Employment and Wages (QCEW) data. EDD job count estimates are typically lower than other estimates because they include only those who have unemployment insurance; proprietors, unincorporated self-employed, unpaid volunteer or family employees, farm employees, domestic employees, and military personnel are not accounted for in the CES estimates. Job counts are based on samples from the Bureau of Labor Statistics (BLS) Longitudinal Database, which includes all establishments covered by unemployment insurance; government jobs are subsequently added in separately. As described in Indicator #1, EDD charges for custom reports (which provide jobs and wage data by industry for smaller geographic areas other than counties); charges and timing will depend on the specifics of the request. As of 2019, costs could be in the range of $500 or more and could take one month or longer. If the custom report was already purchased for jobs data, then no additional report would need to be ordered since the report includes wage data as well.

More information about customized reports can be found here:
https://www.labormarketinfo.edd.ca.gov/resources/lmi-custom-data-services.html

Indicator #4: Study Area Commute Time

Commute Time is the time spent traveling to and from work, as well as during work. The ability for a transportation improvement project to decrease commute time creates congestion relief and can potentially reduce vehicle operating costs and a variety of other health and safety costs.

Current Study Area Commute Times

Finding 4 identifies where employees within the Study Area live and where they work. The estimates calculated by OnTheMap can be seen in **Figure 6.**

Future Updates to Study Area Commute Times

New Economics focused on gathering data for commute times of employees and residents in this analysis. New Economics gathered commute data for the Study Area using the OnTheMap Application, a commute analysis tool provided by the U.S. Census Bureau. New Economics first drew a polygon of the Study Area on the mapping function of the website. Next, New Economics ran three different reports. The first report is an Inflow/Outflow Report that shows how many people work in the Study Area as well as

how many people work and live in the Study Area. This report assumes "home" under the work/home area category, "inflow/outflow" under the analysis type category, and assumes "all jobs" under the job type category. The second report is a Work Destination Report that quantifies where residents of the Study Area are employed by geographical location. This report assumes "work" under the work/home area category, "destination" and "places" as destination type under the analysis type category, and assumes "all jobs" under the job type category. The last report is a Home Destination Report that shows where people who work in the Study Area live by geographical location. This report assumes "home" under the work/home area category, "destination" and "places" as destination type under the analysis type category, and assumes "all jobs" under the job type category.

https://onthemap.ces.census.gov/

Indicator #5: Disadvantaged Community Status

Disadvantaged Communities are communities that (1) have a median household income less than 80 percent of the statewide median, (2) are characterized by the CalEPA to be among the most disadvantaged 25 percent in the state in regards to pollution burden (based on their CalEnviroScreen score), (3) have 75 percent or more of public school students who are eligible to receive free to reduced-price meals under the National School Lunch Program, and/or (4) receive a Healthy Places Index score in the 25th percentile of the state. Projects that serve Disadvantaged Communities are eligible to receive funding from multiple agencies.

Current Study Area Disadvantaged Community Status

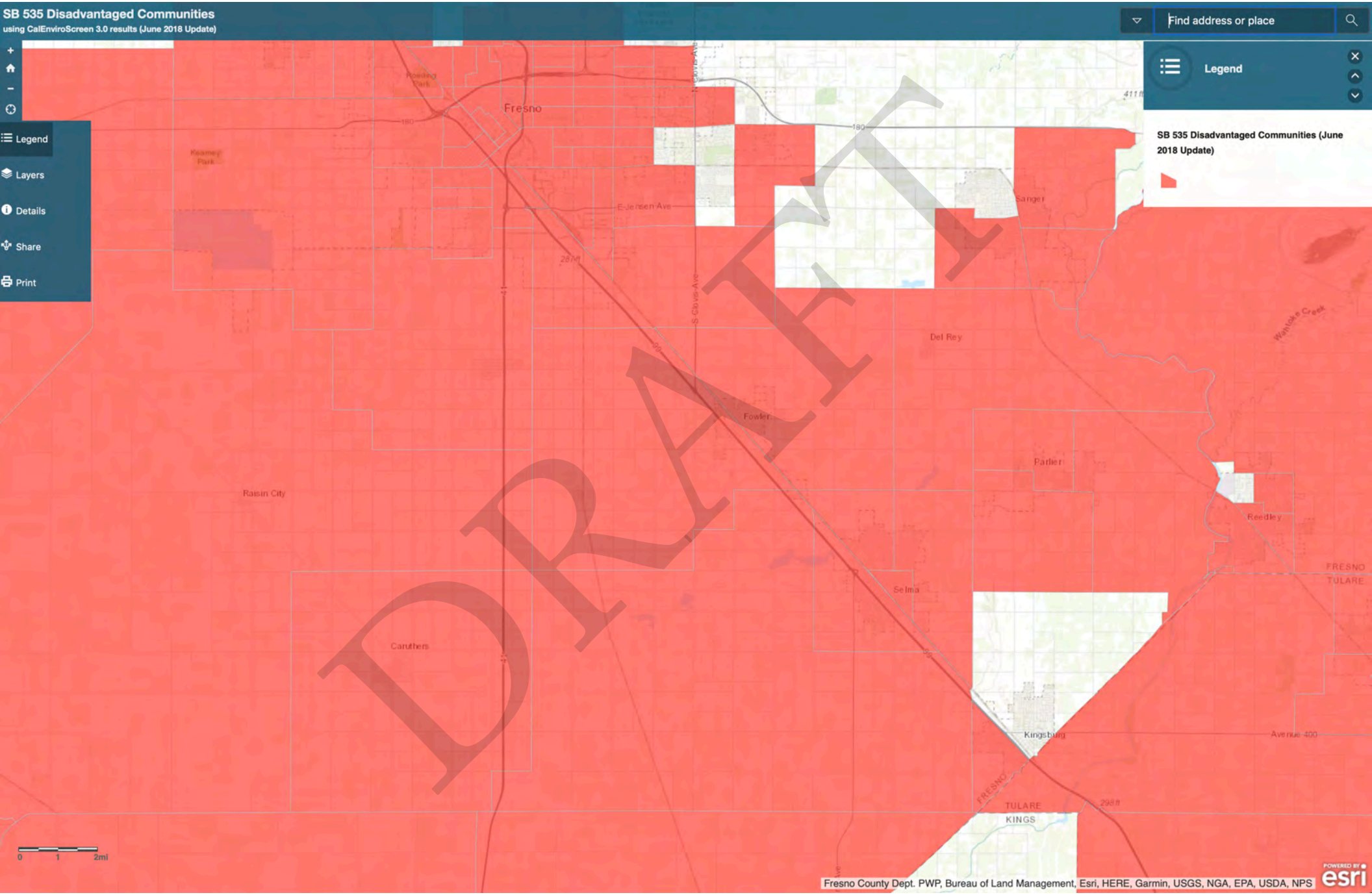
Based on current definitions and metrics, the Study Area meets the requirements to qualify as a Disadvantaged Community. While three of the four census tracts in which the Study Area is located meets the median household income threshold, pollution is a challenge faced by the entirety of the Study Area. **Figure 14** shows that the Study Area is located in a community that is severely impacted by pollution, as indicated by the CalEnviroScreen 3.0 map of Disadvantaged Communities. Additionally, a majority of the Study Area ranks below the 25th percentile of California's Healthy Places Index, as shown in **Figure 15**.

Funding Sources Affected

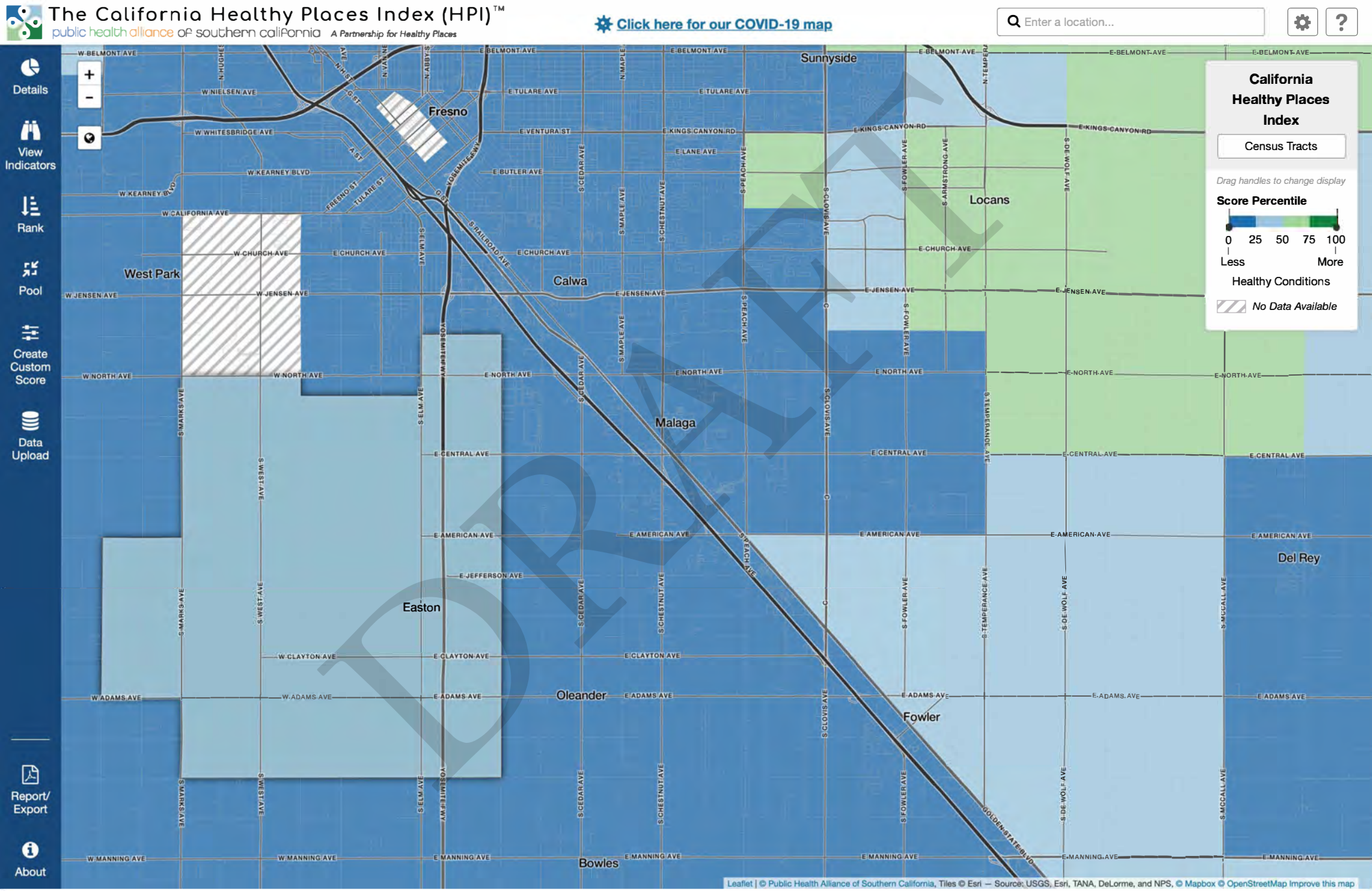
Of the aforementioned sources that could be utilized to fund improvements in the Study Area, Disadvantaged Community Status is an applicable metric for three in particular.

The Caltrans Active Transportation Program (ATP) allocates its total funding into four components, all of which require that a minimum of 25 percent of their funds benefit disadvantaged communities. ATP is projected to provide approximately $223 million in funding for its 2021 funding period, and individual projects can receive a minimum of $250,000 in grant funding.

14 CalEnviroScreen Map of Disadvantaged Communities
Reverse Triangle Study



15 *California Healthy Places Index Map*
Reverse Triangle Study



Sustainable Communities Grants, a funding component of Caltrans Transportation Planning Grants, prioritize projects that integrate environmental justice into their projects. Thus, a minimum of 50 percent of grant funding will be given to projects that benefit disadvantaged communities. Approximately $29.5 million in grant funding will be awarded under the Sustainable Communities Grants for FY 2021-2022.

California's Strategic Growth Council operates the Affordable Housing and Sustainable Communities (AHSC) grant program. This program aims to reduce greenhouse gas emissions by facilitating projects that encourage infill and compact development. AHSC grants priority funding to projects that demonstrate a benefit to Disadvantaged Communities. 50 percent of available funds from the AHSC Program will be reserved for projects benefitting Disadvantaged Communities. Eligible projects can receive up to $30 million per project in funding. At this time, the program requires that 50 percent of any applicant's proposal go toward affordable housing (including housing and/or related infrastructure). Given this requirement, obtaining funding for multi-modal improvements in the Study Area would currently need to be tied to some type of housing project.

Indicator #6: Economic Development Policies

As mentioned in Indicator #5, projects applying to receive AHSC funding must include an affordable housing component. Should a housing project opportunity present itself, a portion of AHSC funds could also be utilized to fund other infrastructure, including transportation infrastructure and transit-related amenities. Those application process favors infrastructure projects that:

- implement, or are within jurisdictions that already have, residential anti-displacement strategies, policies, or programs;
- implement locally-owned business anti-displacement policies, strategies, and/or programs;
- implement workforce development strategies;

Figures 16 and 17 summarize the criteria for each of these three factors. The figures also indicate whether a City and/or County document already has a policy, strategy, or program that would meet the first factor's requirement.

To the extent that future transportation projects can be positioned to compete for AHSC funding in conjunction with a housing project in the Study Area, the City and/or County could secure additional funding for high-priority projects.

16 ***AHSC Infrastructure Metrics: Anti-Displacement***
Reverse Triangle Study

AHSC Metric	County Policy/Strategy	City Policy/Strategy
Residential Anti-Displacement [1]		
Replacement requirements in targeted growth areas such as transit stations, transit corridors, job and housing rich area, downtowns and revitalization areas or policies on sites identified pursuant to Government Code section	Fresno County General Plan Policy TR-B.1-TR-B.6	City of Fresno General Plan UF-1-b, UF-2 to UF-11
Rent stabilization programs beyond what is required by California Civil Code 1946.2.	N/A	N/A
Just cause eviction or other efforts improving tenant stability beyond what is required by California Civil Code 1946.2.	N/A	N/A
Policies to preserve Single Room Occupancy housing or mobile home parks.	Fresno County General Plan H-H.10	City of Fresno 2015-2023 Housing Element Program 7, 10A
Condominium conversion restrictions.	Fresno County Zoning Ordinance Chapter 3 Section 866	N/A
Land banking programs actively receiving funding.	N/A	N/A
Community benefit zoning and/or other land value recapture strategy.	N/A	N/A
Rent review board and/or mediation, foreclosure assistance, or multi-lingual tenant legal counseling services.	United Way Fresno County Services	City of Fresno 2015-2023 Housing Element Policy H-2-e
Density bonus ordinances that expand on state replacement requirements.	Fresno Multi-Jurisdictional Housing Element 2015-2023: Fresno County Action Plan Program 7, 10	City of Fresno 2015-2023 Housing Element Program 4; Fresno Citywide Development Code Article 22 Section 15-2204
First right of return to existing residents policies that include moving expenses.	N/A	N/A
Multi-lingual tenant legal counseling provided by the AHSC applicant.	N/A	N/A
Affirmative marketing strategies or plans targeting nearby neighborhoods, a Disadvantaged Community, or a Low-Income Community.	Fresno Multi-Jurisdictional Housing Element 2015-2023: Fresno County Action Plan Policies 3.1 to 3.6	City of Fresno 2015-2023 Housing Element Program 12A, 27
Locally-Owned Business Anti-Displacement		
Implementation of an overlay zone to protect and assist small businesses.	N/A	City of Fresno HUB Zone Program (administered by U.S. Small Business Administration)
Establishment of a small business advocate office and single point of contact for every small business owner.	N/A	N/A
Creation and maintenance of a small business alliance.	N/A	N/A
Increased visibility of the jurisdiction's small business assistance programs.	N/A	N/A
Formal program to ensure that some fraction of a jurisdiction's purchases of goods and services come from local businesses.	Fresno County Local Vendor Preference (for County purchases)	City of Fresno General Plan "Buy Local Initiative" (ED-1-c)
Prioritization of Minority and Women Business Enterprises (MWBE) for public contracting.	Grants for minority and women-owned businesses affected by COVID; Otherwise N/A.	City of Fresno Disadvantaged Business Enterprise (DBE) Program

[1] The first ten metrics must be implemented by a local juisdiction, while the last three metrics may be voluntrily implemented by project applicants.
Source: AHSC Round 6 FY 2019-2020 Program Guidelines; Fresno County; City of Fresno.
Prepared by New Economics & Advisory, October 2020.

17 AHSC Infrastructure Metrics: Workforce Development
Reverse Triangle Study

AHSC Metric	County Policy/Strategy	City Policy/Strategy
Establishing a partnership with a community-based workforce development and job training entities that have a track record of success serving disadvantaged populations or have demonstrated a high job placement rate among trainees from Disadvantaged Communities.	N/A	N/A
Partnerships with pre-apprenticeship programs, state certified community conservation corps programs, "earn-while-you-learn" programs, youthBuild programs, and/or registered apprenticeship programs that lead to industry recognized credentials, certifications and/or references for long-term employment and that have a track record in serving low income residents.	Fresno County General Plan ED-C.1 to ED-C.4	City of Fresno General Plan ED 4-a to 4-f
Partnerships with local Workforce Investment Board programs serving disadvantaged populations or individuals with barriers to employment.	Fresno County 2015 Economic Development Strategy Initiative 3.1.2	City of Fresno General Plan ED 4-a
Projects that have developed project labor, community workforce, or high-road agreements with targeted local hire specifications or that are in jurisdictions with local hire ordinances that directly apply to the proposed project.	N/A	N/A

Source: AHSC Round 6 FY 2019-2020 Program Guidelines; Fresno County; City of Fresno.
Prepared by New Economics & Advisory, October 2020.

Appendix A: Technical Appendix

A-1 ***Businesses and Jobs by NAICS Code***
Reverse Triangle Study

NAICS		Businesses Number	Businesses %	Jobs Number	Jobs %
11, 22	AG & UTILITIES	4	1%	44	0%
23	CONSTRUCTION	27	9%	423	4%
31-33	MANUFACTURING	46	15%	4,586	42%
42	WHOLESALE	62	21%	978	9%
44-45	RETAIL TRADE	40	13%	3,041	28%
48-49	TRANSPORTATION/WAREHOUSING	36	12%	782	7%
53,54	REAL ESTATE AND PROFESSIONAL SERVICES	19	6%	275	3%
56,61	ADMIN AND EDUCATIONAL SERVICES	11	4%	141	1%
62, 71, 72	HEALTH/SOCIAL, ARTS/ENT/REC, & ACCOMM/FOOD SVC	8	3%	40	0%
81	REPAIR/MAINTENANCE	30	10%	185	2%
92	PUBLIC ADMINISTRATION	14	5%	336	3%
	TOTAL	**297**	**100%**	**10,831**	**100%**
	TOTAL (ROUNDED)	**300**		**11,000**	

Source: Reference USA, New Economics & Advisory.
Prepared by New Economics & Advisory, October 2020.

A-2 *Top Industry Occupations and Wages (2016)*
Reverse Triangle Study

Occupation Title	Study Area 2019	Study Area % of Total	CA State 2016	CA State % of Total	Fresno County MSA Mean Annual Wage (2016)	Fresno County MSA % of Mean Wage
Fresno County MSA Mean Wage (All Industries)						**$44,625**
Machinery, Equipment, and Supplies Merchant Wholesalers-NAICS Code 423800						
Sales Rep, Wholesale and Manuf, Except Technical and Scientific Products			8,000	15%	$76,947	172%
General and Operations Managers			2,500	5%	$109,048	244%
Mobile Heavy Equipment Mechanics, Except Engines			2,400	5%	$53,369	120%
Industrial Machinery Mechanics			2,300	4%	$45,905	103%
Laborers and Freight, Stock, and Material Movers, Hand			2,300	4%	$25,845	58%
Other occupations			34,500	66%	N/A	N/A
Subtotal	**159**		**52,000**	**100%**	**$67,501**	**151%**
Plumbing Htg & Air-Conditioning Contractors-- NAICS Code 238220						
Plumbers, Pipefitters, and Steamfitters			33,350	31%	$51,720	116%
Heating, Air Conditioning, and Regrigeration Meachnics and Installers			19,620	18%	$49,830	112%
Sheet Metal Workers			6,700	6%	$50,510	113%
Office Clerks General			3,860	4%	$34,520	77%
First Line Supervisors of Construction Trades & Extraction Workers			3,170	3%	$75,020	168%
Other occupations			40,480	38%	N/A	N/A
Subtotal	**211**		**107,180**	**100%**	**$51,154**	**115%**
Metal Service Ctrs & Other Metal Merchant Whls-- NAICS Code 423500						
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products			1,700	15%	$75,020	168%
Laborers and Freight, Stock, and Material Movers, Hand			1,400	12%	$30,240	68%
Heavy and Tractor-Trailer Truck Drivers			600	6%	$45,060	101%
Machinists			500	4%	$40,560	91%
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic			500	4%	$33,410	75%
Other occupations			6,500	59%	N/A	N/A
Subtotal	**192**		**11,100**	**100%**	**$49,831**	**112%**
Recreational Vehicle Dealers-- NAICS Code 441200						
Retail Salespersons			2,700	22%	$28,930	65%
Motorcycle Mechanics			1,200	10%	$43,860	98%
Parts Salespersons			1,000	8%	$33,610	75%
Recreational Vehicle Service Technicians			900	8%	$45,540	102%
Management Occupations			900	7%	$105,630	237%
Other occupations			5,600	46%	N/A	N/A
Subtotal	**206**		**12,200**	**100%**	**$44,690**	**100%**
Specialized Freight Trucking-NAICS Code 484200						
Truck Drivers, Heavy and Tractor-Trailer			19,900	50%	$44,111	99%
Laborers and Freight, Stock, and Material Movers, Hand			3,900	10%	$25,845	58%
Office Clerks, General			1,400	3%	$31,918	72%
Dispatchers, Except Police, Fire, and Ambulance			1,400	4%	$42,111	94%
Bus and Truck Mechanics and Diesel Engine Specialists			1,200	3%	$50,223	113%
Other occupations			12,000	30%	N/A	N/A
Subtotal	**437**		**39,800**	**100%**	**$41,091**	**92%**
Electronic Shopping and Mail-Order Houses-NAICS Code 454100						
Shipping, Receiving, and Traffic Clerks			3,600	8%	$29,145	65%
Order Clerks			3,400	8%	$32,062	72%
Customer Service Representatives			3,200	7%	$37,946	85%
Sales and Related Workers, All Other			2,600	6%	$43,012	96%
Truck Drivers, Light or Delivery Services			2,300	5%	$35,085	79%
Other occupations			29,400	66%	N/A	N/A
Subtotal	**2,040 [1]**		**44,400**	**100%**	**$34,937**	**78%**
Printing and Related Support Activities-NAICS Code 323000						
Printing Press Operators			8,400	20%	$34,073	76%
Print Binding and Finish Workers			3,700	9%	N/A	N/A
Graphic Designers			2,200	5%	$50,390	113%
Helpers--Production Workers			2,000	5%	$22,722	51%
Prepress Technicians and Workers			2,000	5%	$52,242	117%
Helpers-- Production Workers			2,000	5%	$26,260	59%
Other occupations			21,000	51%	N/A	N/A
Subtotal	**3,642**		**41,300**	**100%**	**$29,533**	**66%**

[1] Includes cosmetics because New Economics was able to confirm the nature of that business, which has more in common with electronic mail order house.
Source: EDD website, www.labormarketinfo.edd.ca.gov, accesssed October, 2019; 2016 Wages by Occupation for Fresno MSA Occupations; 2016 BLS Occupations by Industry for California.
Prepared by New Economics & Advisory, October 2020.

A-3 *Demographic Profile: Population and Households, Age, Education, Race, Families [1]*

Reverse Triangle Study

Category	Study Area Amount (2018)	Study Area % (2018)	City of Fresno Amount (2018)	City of Fresno % (2018)	Study Area as a % of the City
Population	**3,629**		**528,920**		**1%**
Median Age	34		31		111%
Households	1,054		168,017		1%
Average Household Income	$65,248		$70,640		92%
Population Below the Poverty Line [2]	225		42,144		1%
Age Breakdown					
0-14	787	22%	125,354	24%	1%
15-24	523	14%	83,040	16%	1%
25-54	1,383	38%	209,452	40%	1%
55-64	439	12%	51,305	10%	1%
65 +	497	14%	59,768	11%	1%
Educational Attainment (Population 25yrs+)					
Less than 12th Grade Diploma	744	32%	77,785	24%	1%
High School Graduate/Equivalent	716	31%	71,383	22%	1%
Some College, No Degree	445	19%	76,185	24%	1%
Associate Degree or Higher	408	18%	94,430	30%	0%
Total	**2,318**	**NA**	**320,103**	**NA**	
Race Breakdown					
White Alone	1,691	47%	252,295	48%	1%
Black Alone	76	2%	40,727	8%	0%
American Indian Alone	152	4%	8,463	2%	2%
Asian Alone	258	7%	69,289	13%	0%
Pacific Islander Alone	0	0%	1,058	0%	0%
Some Other Race Alone	1,306	36%	128,528	24%	1%
Two or More Races	149	4%	28,033	5%	1%
Hispanic Origin	2,442	67%	266,576	50%	1%
Family Households	**863**	**81.9%**			
Households with Children	**454**	**43.1%**			

[1] Counts may not match due to rounding.
[2] 2012-2016 ACS value.
Sources: Esri, March 2019.
Prepared by New Economics & Advisory, October 2020.

A-4 *Employment Patterns for Study Area Residents*
Reverse Triangle Study

Category	Study Area Amount (2018)	Study Area % (2018)	City of Fresno Amount (2018)	City of Fresno % (2018)	Study Area as a % of the City
Unemployment Rate	NA	4.8%	NA	6.0%	NA
Employed Population 16+ by Industry					
Agriculture/Mining	534	35.3%	12,550	5.7%	4.3%
Construction	83	5.5%	12,110	5.5%	0.7%
Manufacturing	104	6.9%	14,752	6.7%	0.7%
Wholesale Trade	51	3.4%	7,266	3.3%	0.7%
Retail Trade	123	8.1%	23,780	10.8%	0.5%
Transportation/Utilities	123	8.1%	11,449	5.2%	1.1%
Information	2	0.1%	2,862	1.3%	0.1%
Finance/Insurance/Real Estate	30	2.0%	12,770	5.8%	0.2%
Services	377	24.9%	110,311	50.1%	0.3%
Public Administration	88	5.8%	12,330	5.6%	0.7%
Total	**1,513**	**100.0%**	**220,181**	**100.0%**	**0.7%**

Sources: Esri, 2019.
Prepared by New Economics & Advisory, October 2020.

A-5 *Housing Profile [1]*
Reverse Triangle Study

Category	Study Area Amount (2018)	Study Area % (2018)	City of Fresno Amount (2018)	City of Fresno % (2018)	Study Area as % of the City
Housing (2018) [2]					
Housing Units	1,155		181,503		0.6%
Average Home Price	$367,492		$342,134		107.4%
Household Size	3.4		3.1		111.0%
Tenure (2018) [2]					
Owner Occupied	627	54.3%	84,217	46.4%	0.7%
Renter Occupied	427	37.0%	83,673	46.1%	0.5%
Vacant	100	8.7%	13,431	7.4%	0.7%
Unit Type (2012-2016 ACS Estimate) [3]					
SF	909		111,204		0.8%
MF	7		60,669		0.0%
Other [4]	230		4,105		5.6%

[1] Counts may not match due to rounding.
[2] From the Esri Community Profile Report, March 2019.
[3] From the Esri Housing Summary Report, March 2019.
[4] Includes mobile homes, boats, RVs, and vans.
Sources: Esri, 2019.
Prepared by New Economics & Advisory, October 2020.

A-6 *Commercial Real Estate Market Overview (Study Area)*
Reverse Triangle Study

Real Estate Sector	2010	YTD 2019	Change: 2010-2019 Overall	Change: 2010-2019 Avg. Ann.
Industrial/Flex Market				
# of Buildings	181	199	10%	1.1%
Inventory (Sq. Ft.)	7,572,806	10,234,636	35%	3.4%
Occupancy (Percent)	90.3%	92.5%		
Net Absorption (Sq. Ft.)	200,520	917,209		
NNN Rent (Annual)	$5.04	$5.54	10%	1.1%
Retail Market				
# of Buildings	15	15	0%	0.0%
Inventory (Sq. Ft.)	179,901	179,901	0%	0.0%
Occupancy (Percent)	97.2%	100.0%		
Net Absorption (Sq. Ft.)	0	0		
NNN Rent (Annual)	$19.80	NA	NA	NA
Office Market				
# of Buildings	3	4	33%	3.2%
Inventory (Sq. Ft.)	25,968	31,968	23%	2.3%
Occupancy (Percent)	90.0%	100.0%		
Net Absorption (Sq. Ft.)	(200)	0		
Gross Rent (Annual)	NA	NA	NA	NA

Source: CoStar, 2019.
Prepared by New Economics & Advisory, October 2020.

A-7 Commercial Real Estate Market Comparison
Reverse Triangle Study

Real Estate Sector	YTD 2019 Study Area	City of Fresno	SA As A % of City	Larger Fresno Area	SA As A % of Fresno
Industrial/Flex Market					
# of Buildings	199	2,463	8.1%	4,026	4.9%
Inventory SF	10,234,636	62,672,492	16.3%	112,098,615	9.1%
Occupancy Percent	92.5	95.7	96.7%	96.1	96.3%
Net Absorption SF Total	917,209	686,277	133.6%	2,363,327	38.8%
NNN Rent Overall	$5.54	$5.17	107.2%	$5.31	104.3%
Retail Market					
# of Buildings	15	3,078	0.5%	N/A	N/A
Inventory SF	179,901	32,691,820	0.6%	N/A	N/A
Occupancy Percent	1	94.3	1.1%	N/A	N/A
Net Absorption SF Total	0	(28,474)	0.0%	N/A	N/A
Retail NNN Rent Overall	NA	$14.16	NA	N/A	N/A
Office Market					
# of Buildings	4	1,795	0.2%	N/A	N/A
Inventory SF	31,968	24,455,221	0.1%	N/A	N/A
Occupancy Percent	100	92.7	107.9%	N/A	N/A
Net Absorption SF Total	0	171,879	0.0%	N/A	N/A
Office Gross Rent Overall	NA	$17.83	NA	N/A	N/A

Source: CoStar, 2019.
Prepared by New Economics & Advisory, October 2020.

A-8 *Top Industrial Leases (2018)*
Reverse Triangle Study

Building	Sq. Ft.	Qtr
1. North Pointe Business Park-Bldg 5	122,000	1
2. 480 E N Ave-DDG-384	113,600	1
3. 2325 S Cedar Ave	106,223	4
6. 2875 S East Ave	53,700	1
7. DDG-48 Bldg	47,998	4
8. DDG-1225	44,800	4
9. 3816 S Willow Ave	42,900	1
10. 3816 S Willow Ave	33,600	1
11. 2843-2887 S East Ave	31,800	4
12. 2724 E Annadale Ave	30,000	3
13. 2771 E Malaga Ave	29,000	3
17. 3131 S Willow Ave	23,542	2
18. 2929 S Angus Ave	23,196	3
21. 3688 E Central Ave	21,600	1
22. 3688 E Central Ave	21,600	1
25. 4743 E Jensen Ave	18,000	2
28. 1320 E Fortune Ave	16,745	2
30. 2877 E Jensen Ave	15,400	4
Total # of Leases in Study Area	**18**	
Total # of Leases in Fresno Ind. Mkt.	**40**	
Study Area Leases As A % of Fresno Ind. Mkt. Leases	**45%**	

Source: Costar, Fresno Industrial Market Report, Year End 2018.
Prepared by New Economics & Advisory, October 2020.

A-9 *Top Industrial Sales (2018)*
Reverse Triangle Study

Building	Price	Price/Sq. Ft.	Cap Rate	RBA	Date	Year Built	Buyer	Seller
1. Ulta Beauty	$48,688,800	$73	NA	670,782	4/16/18	2018	Realty Income Corporation	Prologis
3. 2624 E Edgar Ave	$10,500,000	$45	NA	233,840	9/26/18	1989	Candor-Ags, Inc.	Chong C & Hae K Kim
6. 2945 S Angus Ave	$7,500,000	$52	7%	144,000	7/9/18	1988	Industrial Commercial Properties	Mark Slotkin
8. Valley Wide Distribution	$6,300,000	$55	NA	114,978	12/13/17	1997	Valley Wide Beverage Co.	John Carnish
Average		**$56**		**290,900**				

Total # of Sales in Study Area	**4**
Total # of Sales in Fresno Ind. Mkt.	**9**
Study Area Sales As A % of Fresno Ind. Mkt. Sales	**44%**

Source: Costar, Fresno Industrial Market Report, Year End 2018.
Prepared by New Economics & Advisory, October 2020.

Appendix B: Methodology

This appendix documents the technical methodologies and backup calculations that support findings for the Reverse Triangle Economic Conditions memorandum.

Job Counts

New Economics gathered job counts by business (and by industry) in the Study Area using Reference USA. Reference USA is a third-party private data source. The data from these sources were collected by the New Economics staff over the month of March, 2019.

Reference USA continuously updates their database through research and also gathers employee counts by phone verification. The total number of employees varies depending on what time of the year the business is called. Approximately 80 percent of their employee counts are full-time workers, while the remaining 15 percent is an estimate that is assumed to account for seasonal and/or part-time employees. Finally, because the information is self-reported by the telephone respondent, the official number of employees may or may not be accurate.

Business Composition of the Corridor

New Economics gathered business counts by industry in the Study Area from Reference USA. Reference USA is a third-party private data source. The data from this source was collected by the New Economics staff over the month of March 2019.

Reference USA continuously updates their database through research and also gathers employee, new business, business shutdowns, and changing business location counts by phone verification.

Reference USA makes business listing information available by zip code. New Economics initially extracted business listings for 3 zip codes included in the Study Area: 93706, 93725, and 93625. Next, we used GIS to filter out business listings outside of the Study Area boundaries. For each business listing, the database includes fields for company name, address, employees at the location, location sales, Standard Industry (SIC) Code, contact name, and phone number.

If a company's business location is listed at the permanent residence of the owner or the place where the company started doing business is not in the Study Area, these corporations are not included in the database. In addition, if the business is fairly new, it may not be included in the database.

Wage Analysis

Using California Employment Development Department (California EDD) wage data, New Economics gathered wage information for the 5 industries with the largest number of employees in the Study Area. This methodology included the following steps:

1. Identification of the largest industries (expressed as North American Industry Classification System or NAICS) from the Study Area using Reference USA data.
2. Determination of the 5 most prevalent occupations within those industries statewide using the California EDD data. This occupation data is not offered at geographies smaller than the state; therefore, New Economics assumed that the top 5 occupations in California would be reflective of the top 5 occupations in the Study Area.
3. Identification of local wage data for these occupations; New Economics gathered annual average wage information for the Fresno County MSA from the California EDD.
4. Comparison of the annual average wage for particular occupations to the Fresno County mean annual wage.

Demographic/ Socio-Economic Analysis

New Economics gathered demographic and socio-economic data for the Study Area as well as for the City of Fresno from ESRI. ESRI is a third-party private data source. The data from ESRI was collected by the New Economics staff over the month of March, 2019.

Using this data and information gleaned from ESRI, New Economics was able to compare the Study Area to the City of Fresno and develop a demographic and socio-economic profile of the Study Area.

Industrial/Commercial Market Indicators

New Economics collected industrial and commercial data from the data source Costar. Costar is a third-party private data source. The data from Costar was gathered by New Economics during March and July of 2019.

The New Economics team collected historical data including number of buildings, inventory square footage, occupancy rates, net absorption, and rent rates for the Study Area and the City of Fresno. New Economics analyzed this data in order to gain a better understanding of the types industrial and commercial activity that occurs in the Study Area and to identify key trends. For the industrial market, New Economics also evaluated the 2018 year-end report of the Fresno Industrial Market. This analysis also allowed New Economics to see what role the industrial properties in the Study Area played in the Fresno Industrial Market as a whole.

Stakeholder Interviews

New Economics conducted a series of interviews with a series of stakeholders representing the public economic development departments, local water districts, real estate brokerage firms, land developers, major distribution businesses, and small/medium size distribution businesses.

The purpose of these interviews was to gather anecdotal information about business activity in the Study Area and potential transportation improvements that could help

sustain and/or expand activity over time. To protect confidentiality, observations and insights gained from interviews were aggregated into findings shared in the main report only and individual names and/or entities are not being released.

Local-Serving Retail Demand

New Economics analyzed the retail market setting to characterize the scale of local-serving retail that exists in the Study Area.

As shown in **Figure 11**, the City of Fresno currently supports approximately 13 square feet of Neighborhood Retail space and 3 square feet of Strip Retail space. This space represents occupied retail center space as of the first quarter of 2020 and population estimate dated January 1, 2019. Applying these benchmarks to the Study Area population produces an estimate of nearly 57,000 square feet of local-serving retail space that could be supported by Study Area residents.

New Economics then reviewed the Study Area business listings inventory from Reference USA to identify all potential local-serving existing retail establishments, including restaurants, grocery stores, gasoline service stations and mini-marts, apparel stores, etc. This review did NOT include any car dealerships or car repair shops, which would be classifies as community or regional retail. New Economics verified the existence of the business using Google Maps and also estimated the building square footage. This research produced an estimated amount of existing local-serving retail space, shown in **Figure 11**.

New Economics also considered typical, local-serving retail establishments that do not currently exist within the Study Area, such as banks (including financial services), pharmacies, and hair salons; using Google Maps, New Economics located the nearest existing retailer and documented the distance from the center of the Study Area.

Appendix K: Cedar Plan Line Memorandum

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 generally created based off the specific plans of the City and County. According to the GHD's scope of work, a plan 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 identify potentially impacted utility infrastructure located above and below ground along the Cedar Avenue corridor.

6.1 California High Speed Rail

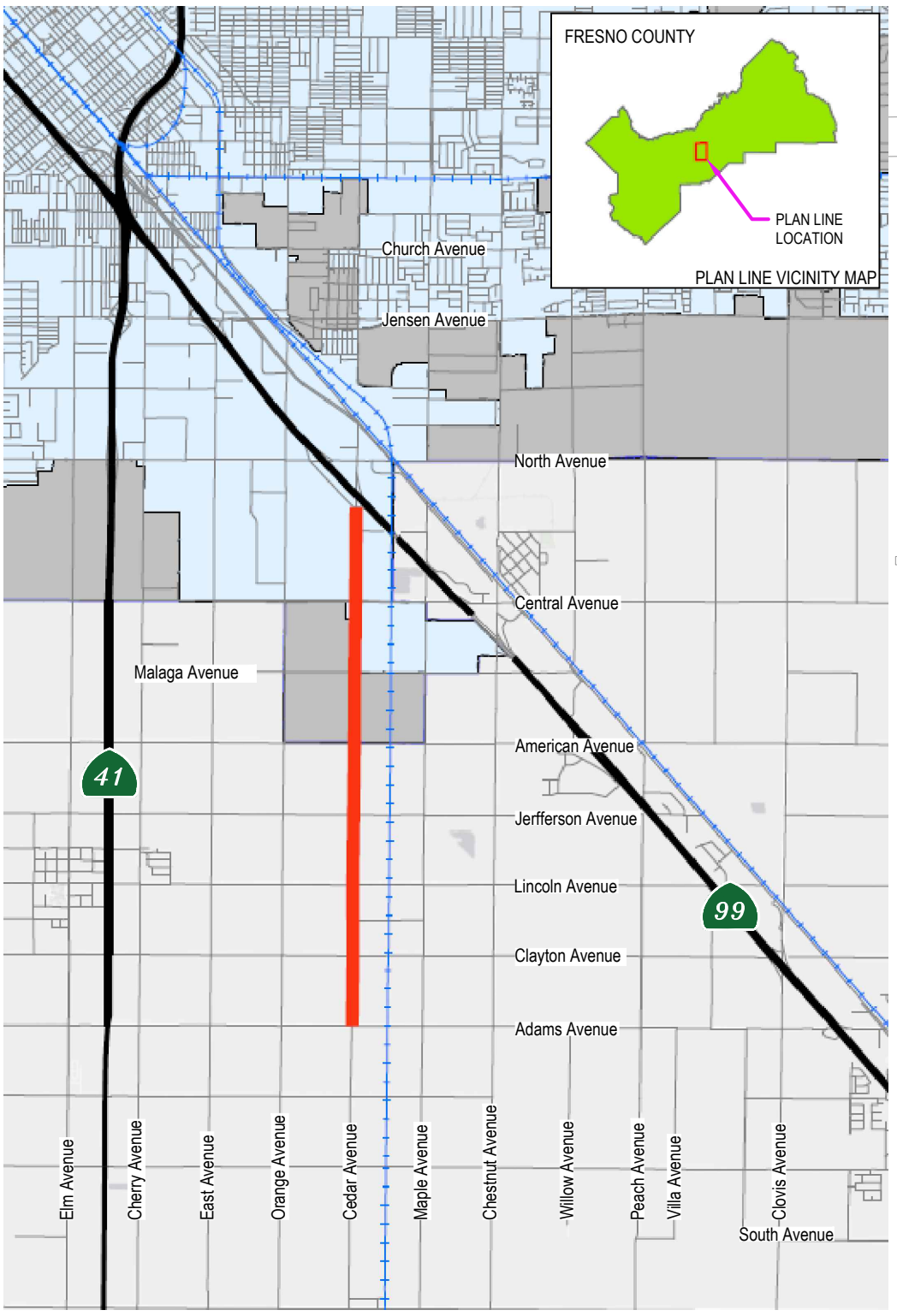
According to City of Fresno's *General Plan Land Use and Circulation Map*, the Cedar Avenue corridor between SR 99 and Adams Avenue is planned for heavy industrial land uses. The Cedar Avenue corridor line lies within agricultural and industrial land uses. Figure 6.1, Cedar Avenue Plan Line Vicinity map, illustrates City of Fresno and County of Fresno boundaries. The HSR facility is currently being constructed ¼ east of Cedar Avenue, passing through the RTTAP Study area between State Route 99 the southern limits along Adams Avenue.

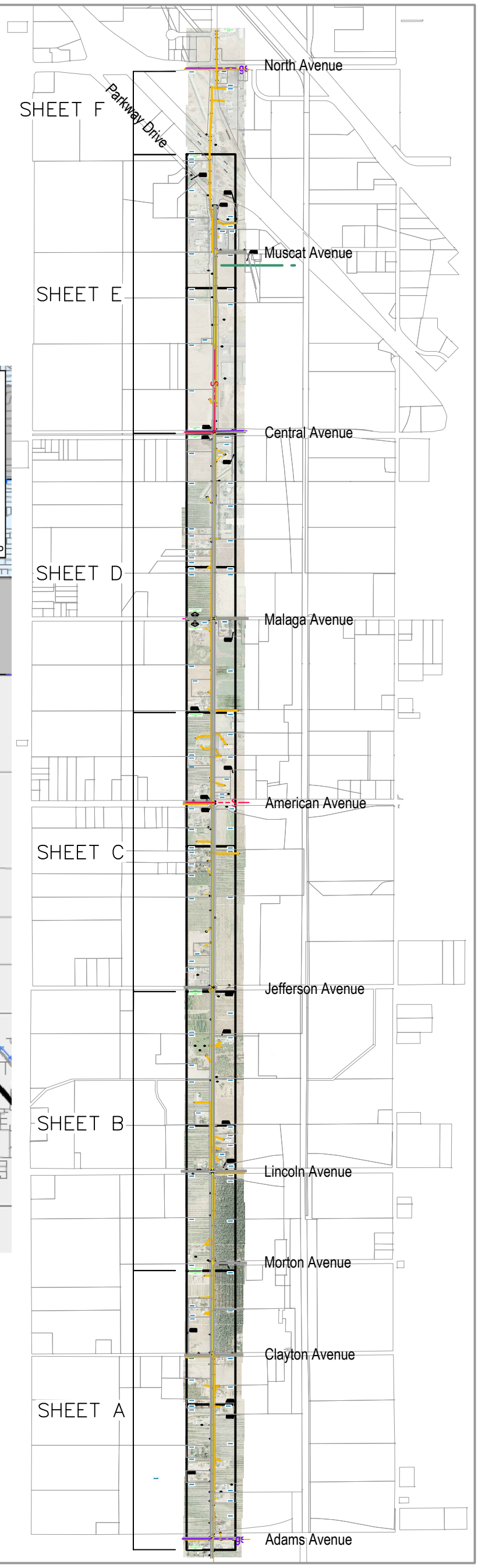
The overall natural elevation grade differential of the site area is approximately 10 feet, derived from topographic maps from US Geological Survey. Starting along the Burlington Northern Santa Fe (BNSF) right-of-way, the site's northern most area rises four feet in over 1.5 miles to a 290 foot elevation 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 ¼ mile distance at the northern end of the corridor. 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.

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

DRAFT CONCEPT
PLAN LINE
CEDAR AVENUE

FROM
PARKWAY WAY DRIVE/STATE ROUTE 99 SOUTHBOUND
ON-RAMP TO ADAMS AVENUE





Reverse Triangle Transportation Area Plan

Fresno Council of Governments

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GHD

CEDAR AVENUE PLAN LINE
VICINITY MAP AND MASTER MAP
(SECTIONS A-F)

Project No. **11192258**
Date **01.31.2020**

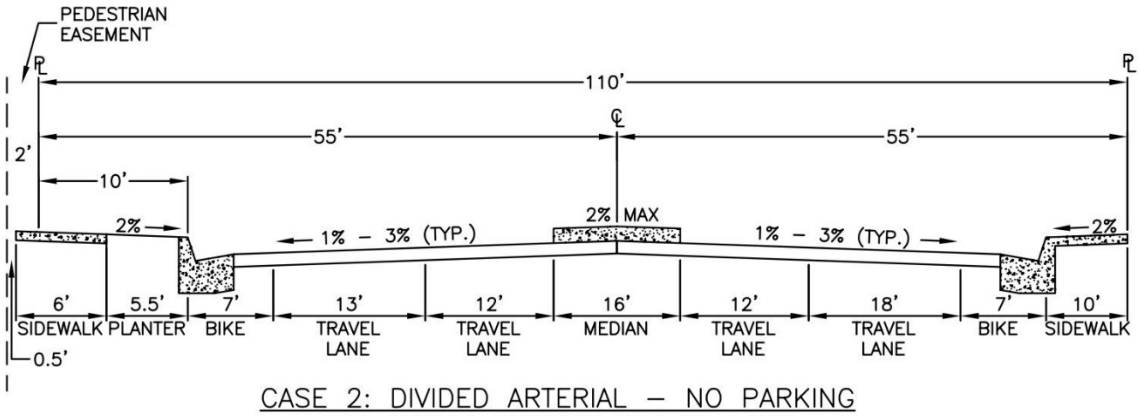
FIGURE 6.1

Filename: \\ghdnet\ghd\US\Visalia\Projects\Legacy\Prj\2618\2618AT003.dwg Plot Date: 24 May 2021 - 12:28 PM

Source: Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA
Bk. 330-Pg. 02, 03, 04, 06, 13, 15, 17, 19, 21, 22, 23
Bk. 334-Pg. 04, 07, 25, 30, 31, 32, 33, 35
Fresno Works, May 2018: ALLOCATION & BOUNDARIES Model

6.2 Cedar Avenue Cross-Section

The Cedar Avenue corridor is classified as an arterial street[2]. However, the current corridor width is less than the allowable City's design standard for an arterial street of 100 feet to 110 feet in total width. As travel demand on the corridor increases, Cedar Avenue will likely need to be widened to provide for additional capacity. 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[3] 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

This cross-section is overlaid on the master maps to show the amount of right-of-way that would be needed to accommodate the standard width of the roadway.

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

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

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

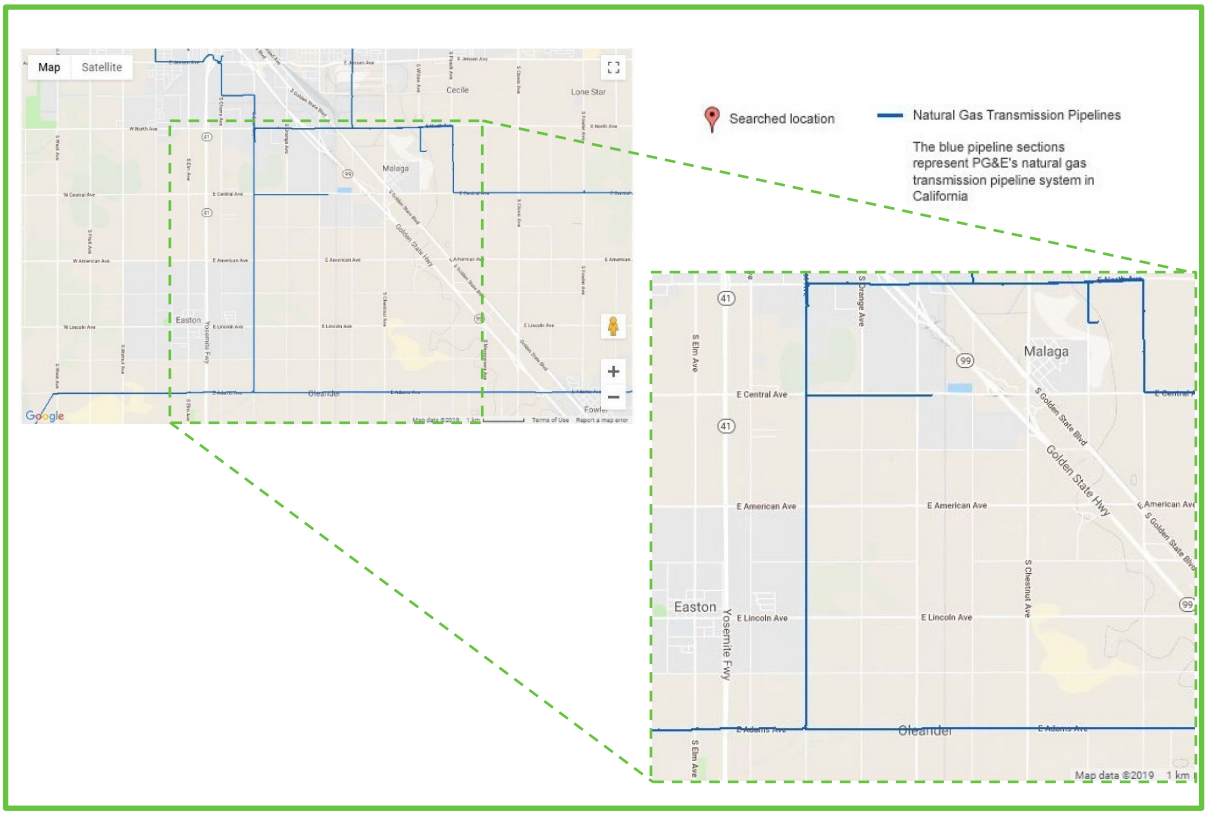
Avenue. However, at the intersection of North Avenue and Cedar Avenue, it is noted that there is currently a sewer with a diameter of at least 33 inches. *Wastewater Collection System Master Plan* depicts the City's plan of implementing a modeled sewer along Malaga Avenue.

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.



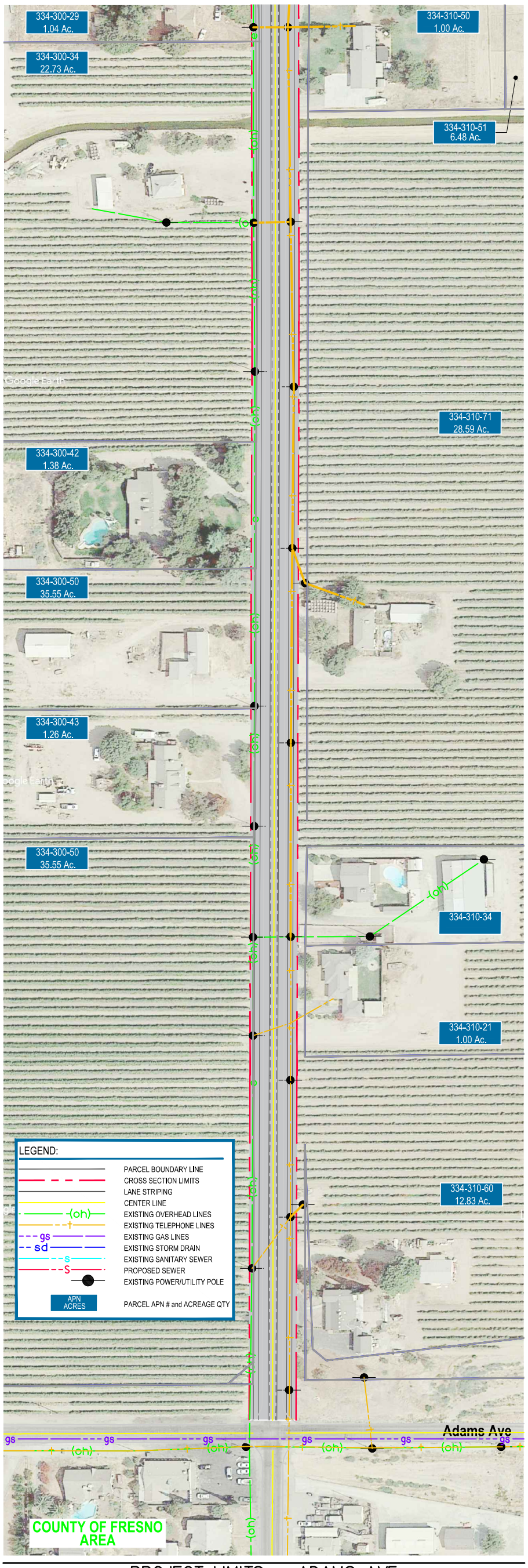
Gas Transmission Pipeline Map: https://www.pge.com/

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).

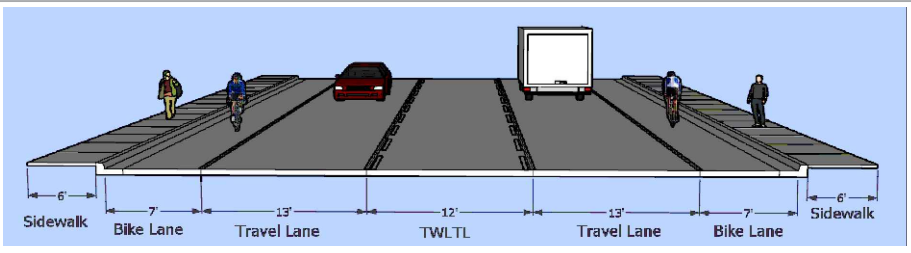
Appendix: Cedar Avenue Plan Line

- Master Sheet Sections

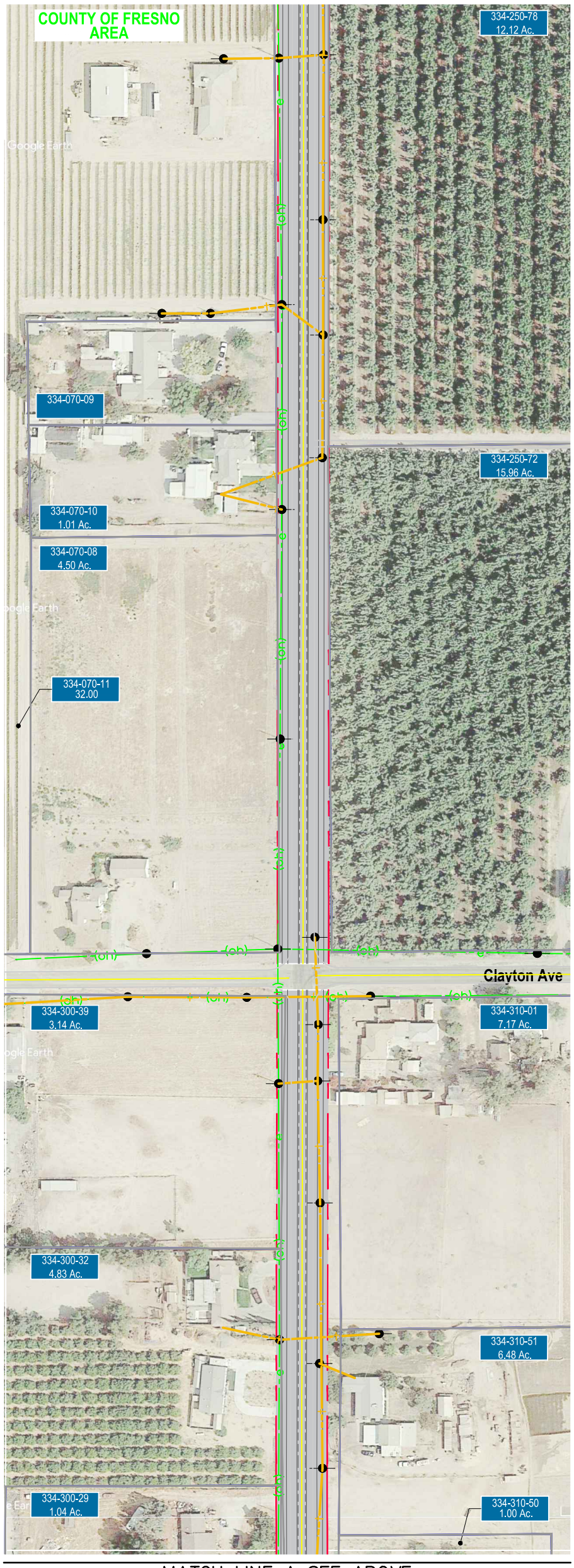
MATCH LINE A SEE BELOW



PROJECT LIMITS – ADAMS AVE



MATCH LINE B SEE SECTION B



MATCH LINE A SEE ABOVE

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

N

GHD

CEDAR AVENUE PLAN LINE
SECTION A

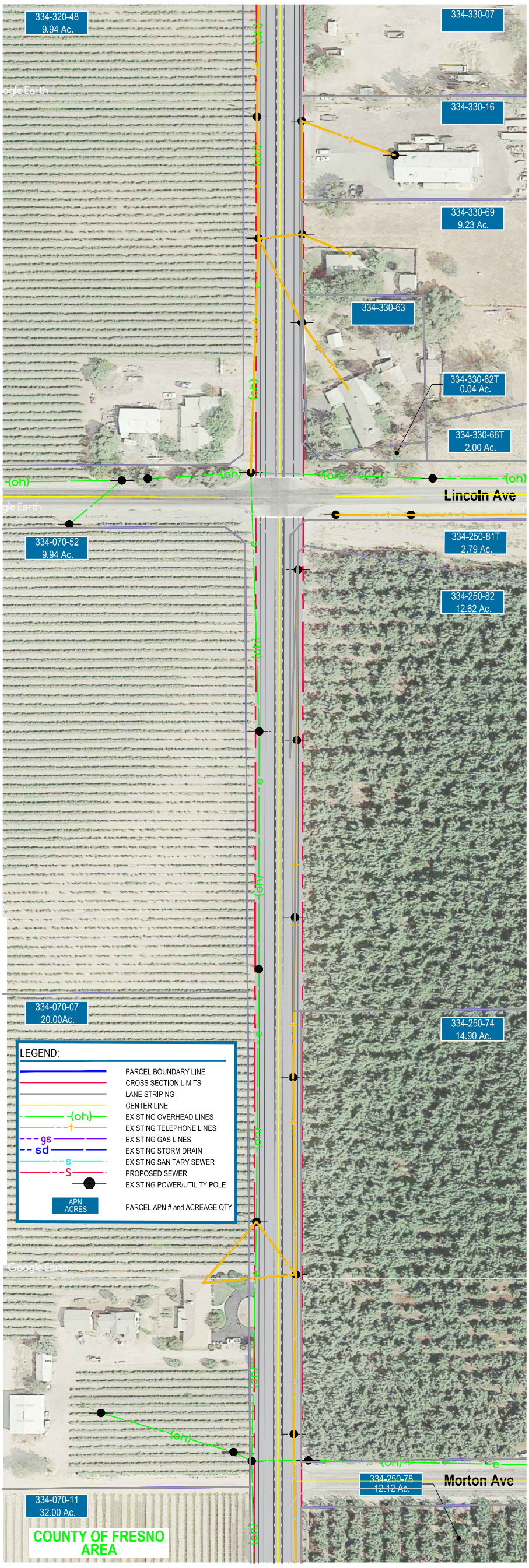
Project No. **11192258**
Date **01.31.2020**

FIGURE 6.1A

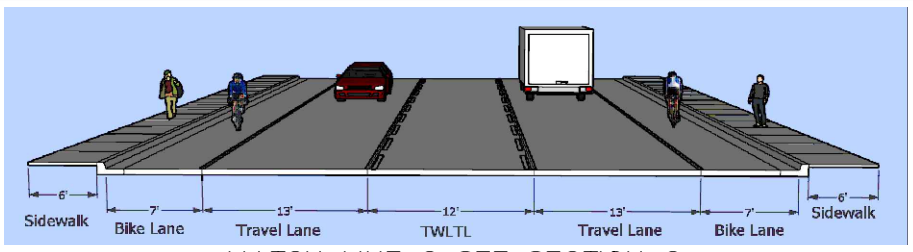
Filename: L:\Prj\2618\2618AT003.dwg Plot Date: 4 February 2020 - 12:39 PM

Source: Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA
Bk. 330-Pg. 02, 03, 04, 06, 13, 15, 17, 19, 21, 22, 23
Bk. 334-Pg. 04, 07, 25, 30, 31, 32, 33, 35
Fresno Works, May 2018: ALLOCATION & BOUNDARIES Model

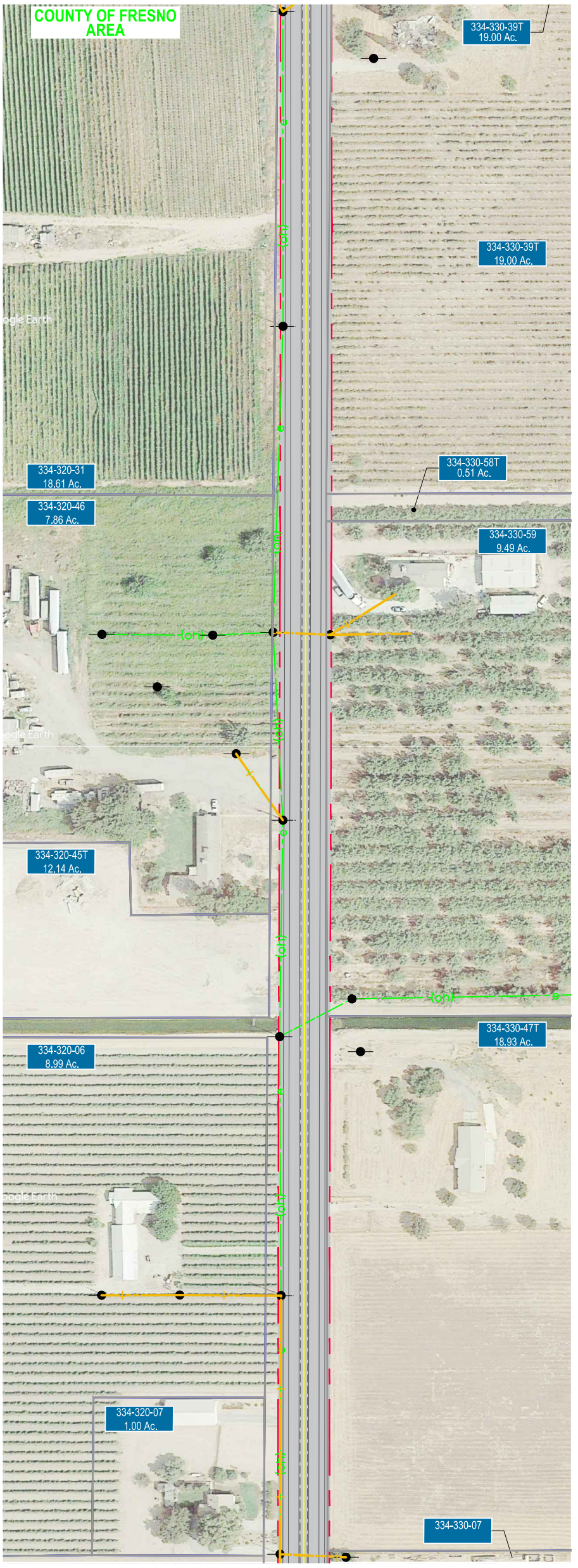
MATCH LINE B SEE BELOW



MATCH LINE B SEE SECTION A



MATCH LINE C SEE SECTION C



MATCH LINE B SEE ABOVE

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

N

GHD

CEDAR AVENUE PLAN LINE
SECTION B

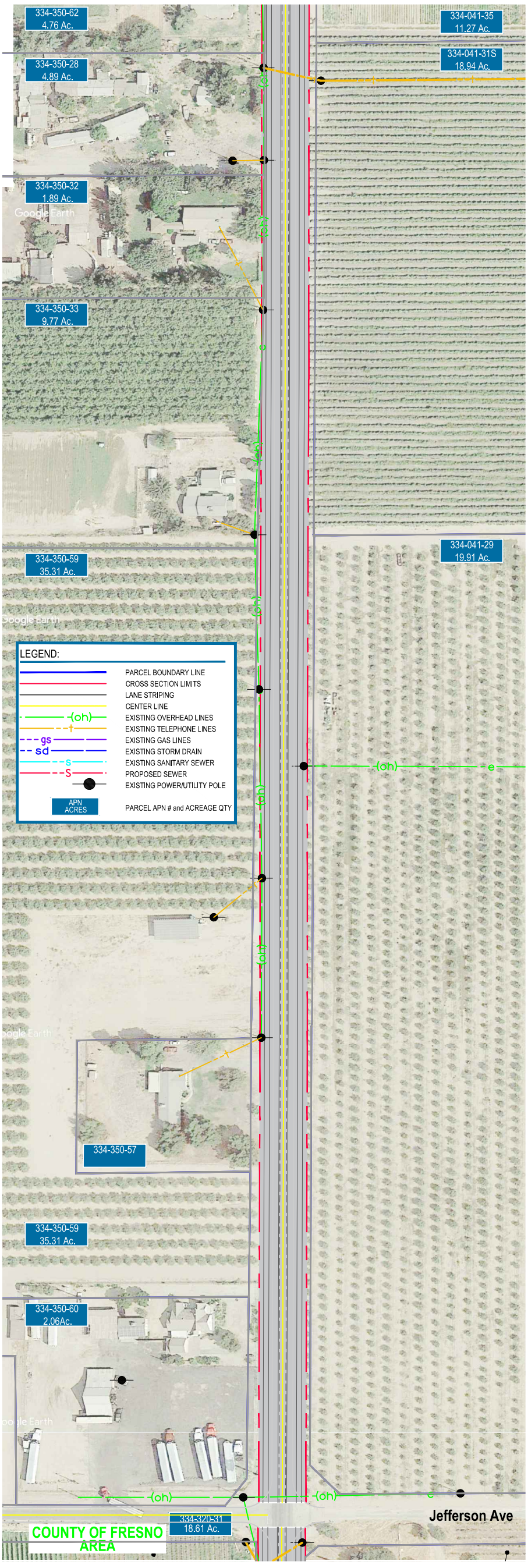
Project No. **11192258**
Date **01.31.2020**

FIGURE 6.1B

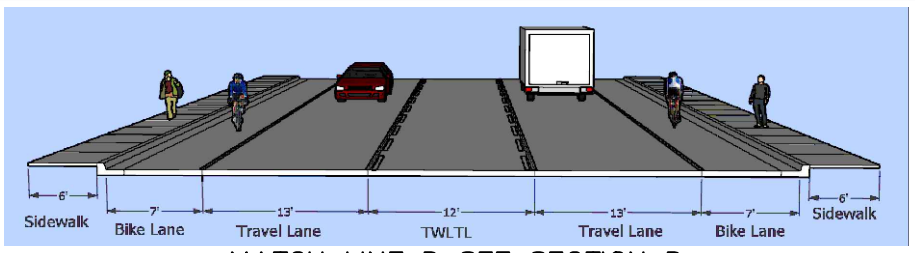
Filename: L:\Prj\2618\2618AT003.dwg Plot Date: 4 February 2020 - 12:40 PM

Source: Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA
Bk. 330-Pg. 02, 03, 04, 06, 13, 15, 17, 19, 21, 22, 23
Bk. 334-Pg. 04, 07, 25, 30, 31, 32, 33, 35
Fresno Works, May 2018: ALLOCATION & BOUNDARIES Model

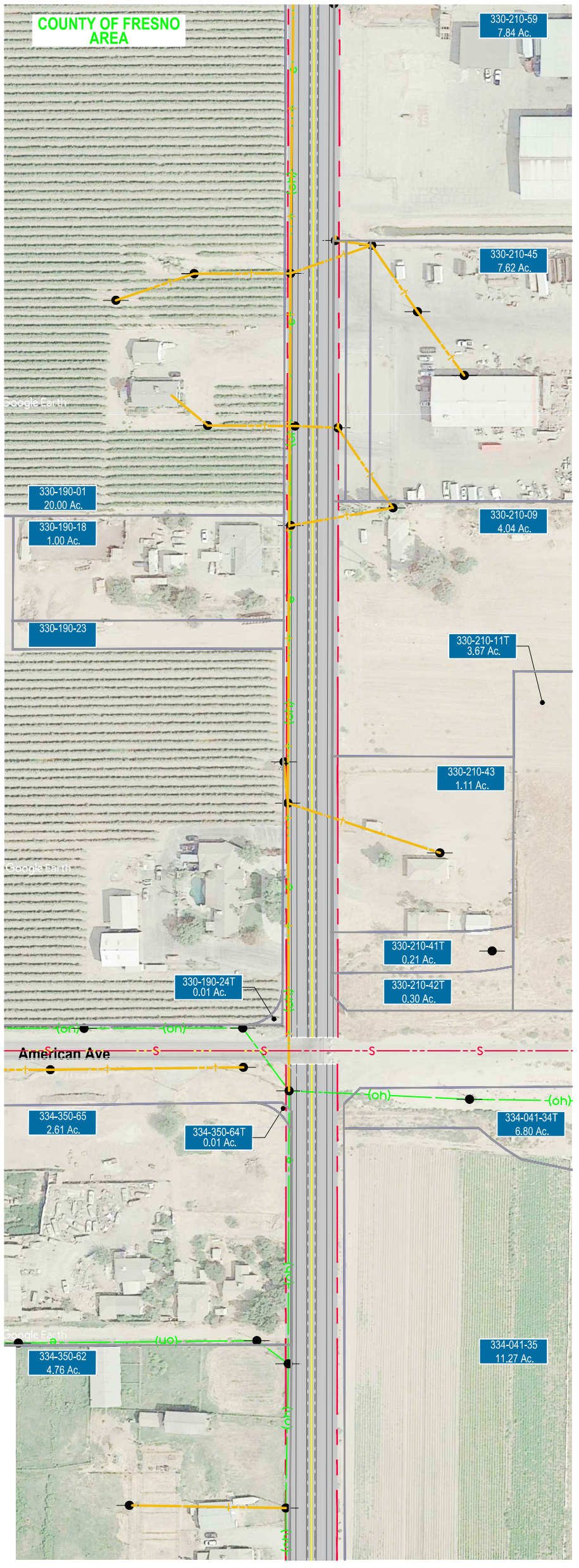
MATCH LINE C SEE BELOW



MATCH LINE C SEE SECTION B



MATCH LINE D SEE SECTION D



MATCH LINE C SEE ABOVE

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

N

GHD

CEDAR AVENUE PLAN LINE
SECTION C

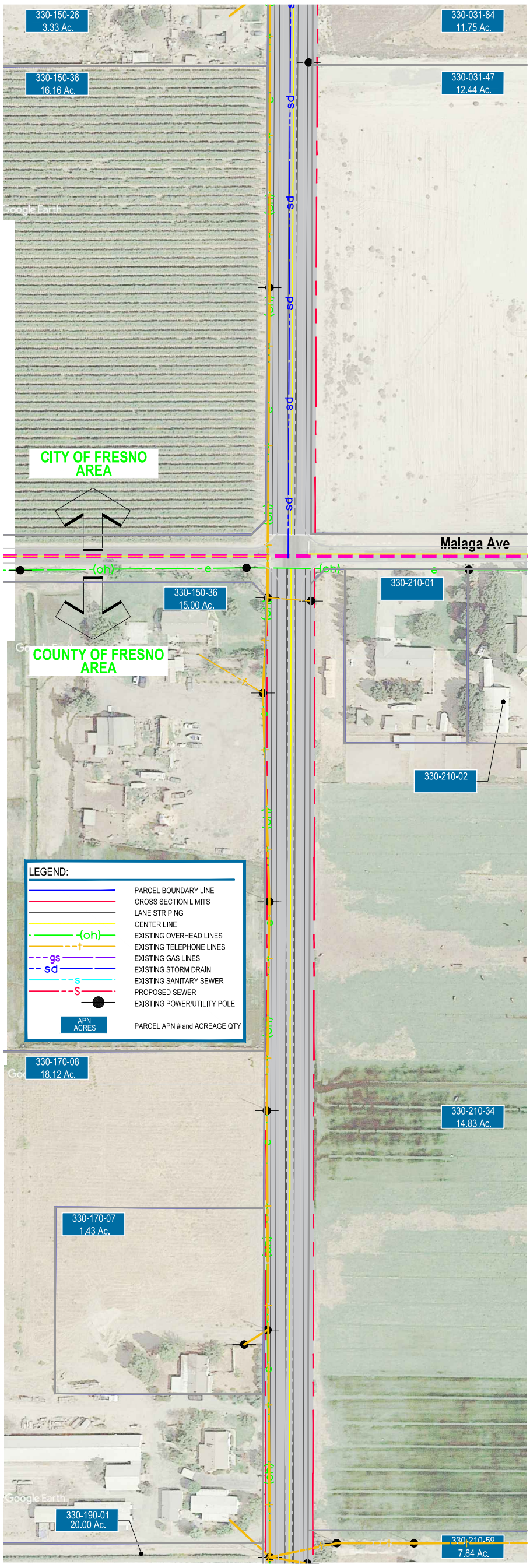
Project No. **11192258**
Date **01.31.2020**

FIGURE 6.1C

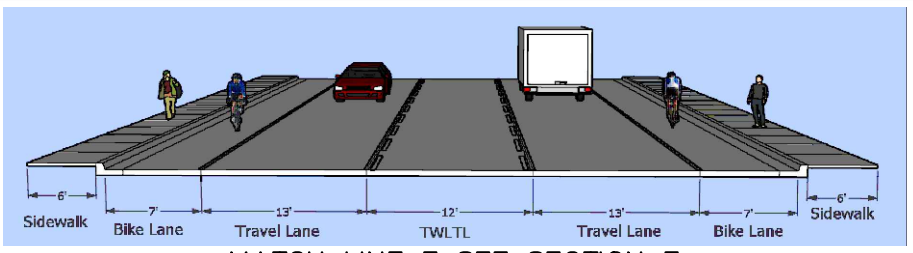
Filename: L:\Prj\2618\2618AT003.dwg Plot Date: 5 February 2020 - 1:40 PM

Source: Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA
Bk. 330-Pg. 02, 03, 04, 06, 13, 15, 17, 19, 21, 22, 23
Bk. 334-Pg. 04, 07, 25, 30, 31, 32, 33, 35
Fresno Works, May 2018: ALLOCATION & BOUNDARIES Model

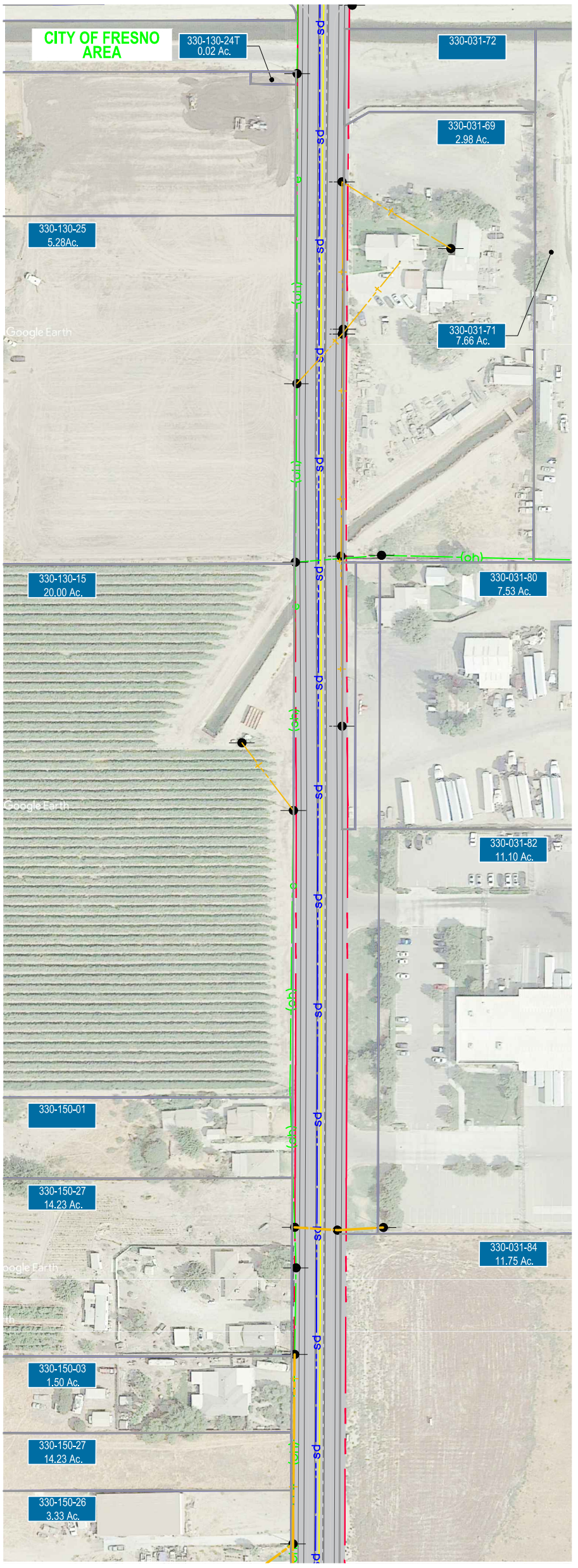
MATCH LINE D SEE BELOW



MATCH LINE D SEE SECTION C



MATCH LINE E SEE SECTION E



MATCH LINE D SEE ABOVE

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

N

GHD

CEDAR AVENUE PLAN LINE
SECTION D

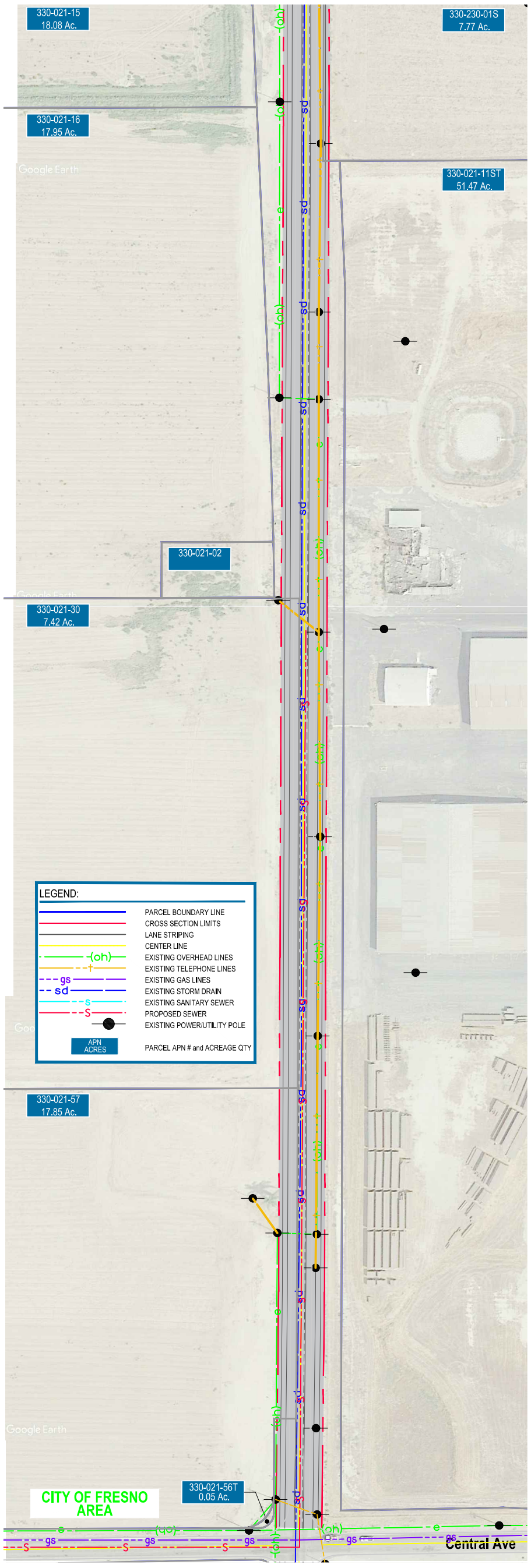
Project No. **11192258**
Date **01.31.2020**

FIGURE 6.1D

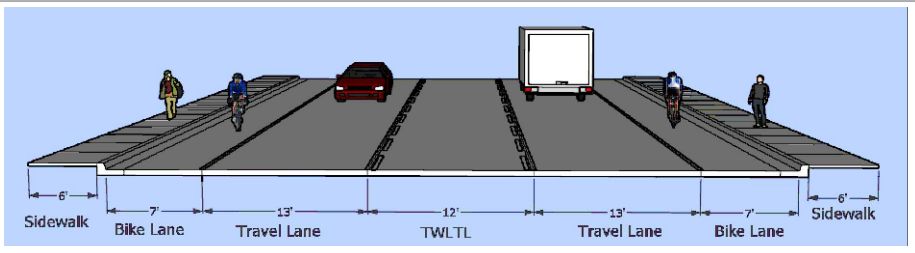
Filename: L:\Prj\2618\2618AT003.dwg Plot Date: 4 February 2020 - 12:41 PM

Source: Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA
Bk. 330-Pg. 02, 03, 04, 06, 13, 15, 17, 19, 21, 22, 23
Bk. 334-Pg. 04, 07, 25, 30, 31, 32, 33, 35
Fresno Works, May 2018: ALLOCATION & BOUNDARIES Model

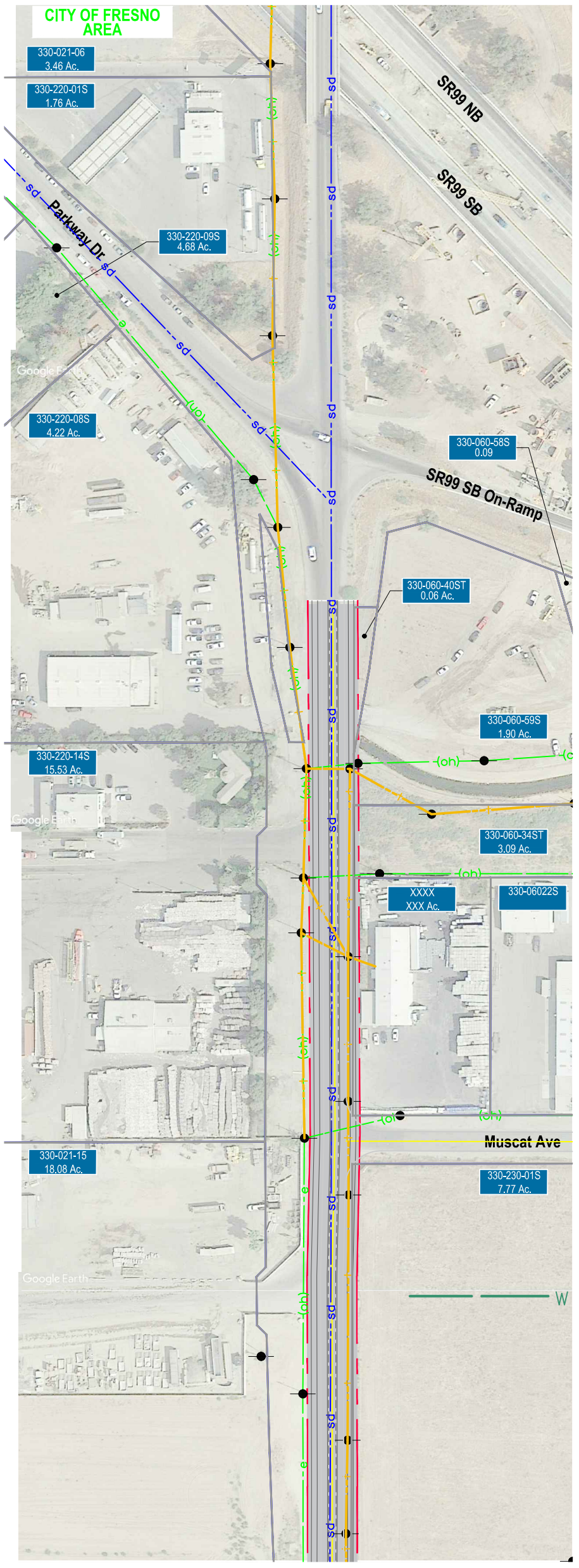
MATCH LINE E SEE BELOW



MATCH LINE E SEE SECTION D



MATCH LINE F SEE SECTION F



MATCH LINE E SEE ABOVE

REVERSE TRIANGLE
TRANSPORTATION AREA PLAN

Fresno Council of Governments

N

GHD

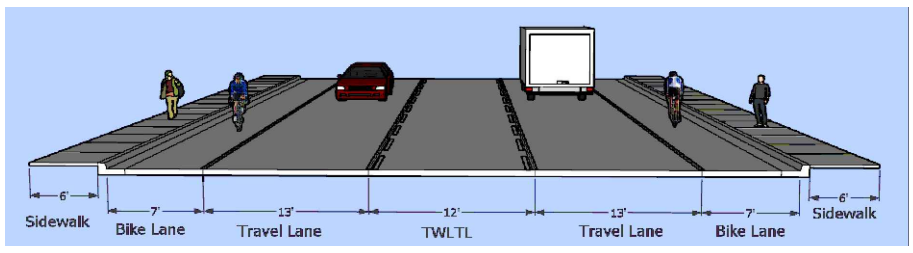
CEDAR AVENUE PLAN LINE
SECTION E

Project No. **11192258**
Date **01.31.2020**

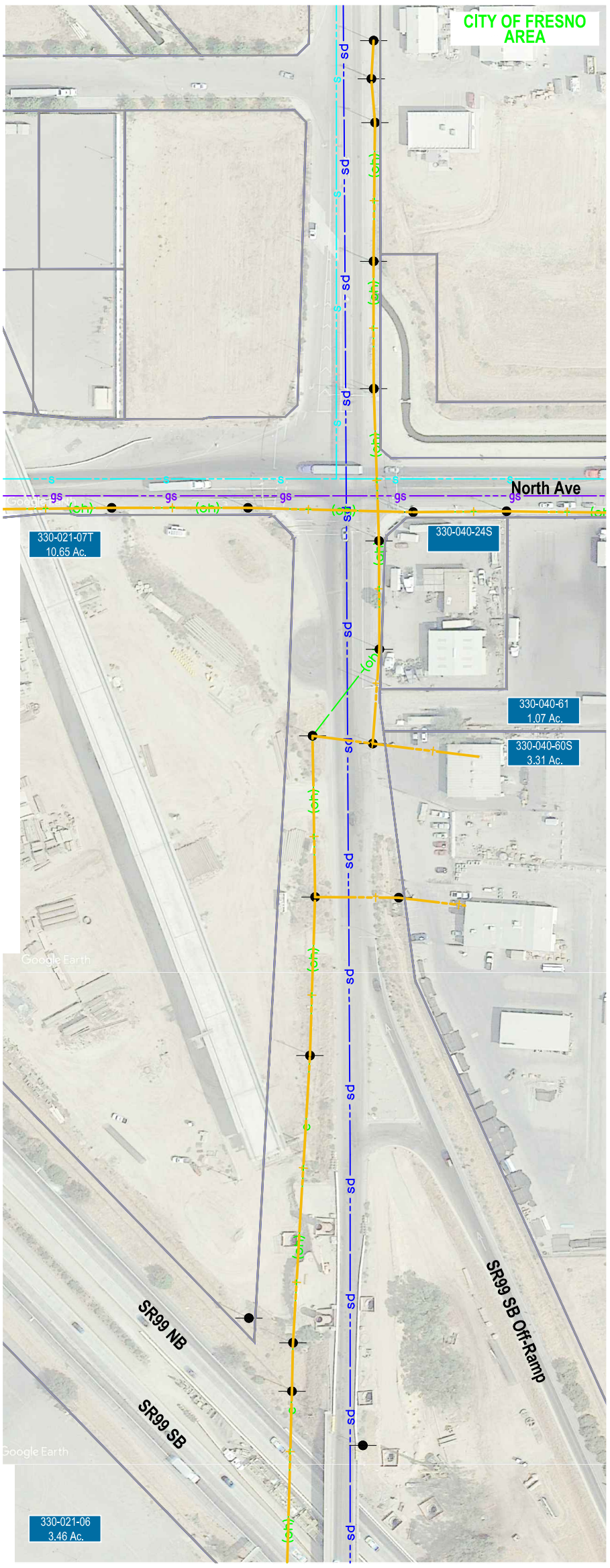
FIGURE 6.1E

Filename: L:\Prj\2618\2618AT003.dwg Plot Date: 4 February 2020 - 12:41 PM

Source: Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA
Bk. 330-Pg. 02, 03, 04, 06, 13, 15, 17, 19, 21, 22, 23
Bk. 334-Pg. 04, 07, 25, 30, 31, 32, 33, 35
Fresno Works, May 2018: ALLOCATION & BOUNDARIES Model



PROJECT LIMITS – NORTH AVE



LEGEND:

- PARCEL BOUNDARY LINE
- CROSS SECTION LIMITS
- LANE STRIPING
- CENTER LINE
- EXISTING OVERHEAD LINES
- EXISTING TELEPHONE LINES
- EXISTING GAS LINES
- EXISTING STORM DRAIN
- EXISTING SANITARY SEWER
- PROPOSED SEWER
- EXISTING POWER/UTILITY POLE
- APN / ACRES — PARCEL APN # and ACREAGE QTY

MATCH LINE F SEE SECTION E

REVERSE TRIANGLE TRANSPORTATION AREA PLAN

Fresno Council of Governments

N

GHD

CEDAR AVENUE PLAN LINE
SECTION F

Project No. **11192258**
Date **01.31.2020**

FIGURE 6.1F

Filename: L:\Prj\2618\2618AT003.dwg Plot Date: 4 February 2020 - 12:42 PM

Source: Fresno County Surveyor's Office Map
Assessor's Map, County of Fresno, CA
Bk. 330-Pg. 02, 03, 04, 06, 13, 15, 17, 19, 21, 22, 23
Bk. 334-Pg. 04, 07, 25, 30, 31, 32, 33, 35
Fresno Works, May 2018: ALLOCATION & BOUNDARIES Model

Appendix L: RTTAP Draft Comment Response Letter

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USA
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Our ref: 11192285

2 July 2021

Leadership Counsel for Justice and Accountability
Grecia Elenes, Senior Policy Advocate
764 P. Street, Suite 012
Fresno, CA 93721

RESPONSE TO RTTAP COMMENT LETTER JUNE 24, 2021

Dear Ms. Elenes,

Thank you for providing written comments to the DRAFT Reverse Triangle Transportation Area Plan (RTTAP) prepared by GHD. We appreciate your commitment to work alongside residents and communities within the study area and to be involved in the transportation planning process in the area. The responses in this letter are provided after the main section heading, similar to the way your June 24, 2021, (attached) letter was organized.

Your comment: RTTAP Must Follow the Truck Reroute Study and South Central Specific Plan Process

Responses: You are correct to identify two plans that are of interest to the RTTAP process; one that has been on-going for several years and one that will be underway soon. The South Central Specific Plan (SCSP) is a long-range planning document that provides a 20-30 year vision for growth and development in the community. Additionally, a Truck Reroute Study will be kicking off very soon that will evaluate and recommend revisions to designated truck routes in south Fresno, encompassing the entire RTTAP study area.

SCSP was underway prior to RTTAP project initiation and is still active today, according to City of Fresno staff. During development of the RTTAP, we were very interested in studies and projects within and adjacent to the RTTAP. GHD staff attended a workshop in Calwa for the SCSP. In an effort to try to include the SCSP, the RTTAP project was put on hold for nearly one (1) year as we awaited a preferred land use plan. No preferred land use has been approved; therefore, our future analysis is based upon approved General Plan land uses in the City and County.

The upcoming Truck Reroute Study *for the South Central Fresno Community*, born from *AB 617 program*, has not been initiated at this time. The City is working through the RFP process but has yet to select a consultant to conduct this study. It is likely that this project will take approximately one (1) year to complete.

Although it would be ideal for this project to wait until the Truck Reroute Study and the SCSP are completed, the RTTAP grant funding from Caltans is set to expire in June 2021. The RTTAP will be sent to the Fresno COG Policy Board for acceptance at the July Board meeting, in order to complete the grant project and close the books.

Your comment: The RTTAP is Not Consistent with Caltrans Sustainable Planning Grant Guidance

Responses: The RTTAP encompasses Caltrans Sustainable objectives and provides necessary information to submit applications for ATP and other programs. Several sections of the RTTAP are dedicated to meeting the objectives outlined under Caltrans Grants including the RTTAP's Smart Mobility Framework section. Table 1 – Smart Mobility Objectives and Performance Metrics is shown below:

Table 1 – Smart Mobility Objectives and Performance Metrics

Smart Mobility Objective	Analysis Purpose	RTTAP Performance Metric
Location Efficiency	Bicycle Connectivity	Bicycle Level of Traffic Stress
	Multimodal Facility Access	Bicycle Mode Share (# New Trips)
Reliable Mobility	Roadway Operations	Delay Reduction (Motorized/Non-Motorized)
	Roadway Service Quality	Vehicular Travel Time
Health and Safety	Safety	Crash Reduction (Roadways & Intersections)
	Health	Health Cost Savings (per Capita)
Environmental Stewardship	Air Quality	Vehicle Emissions Reduction
	Adaptation	Network Vulnerability & Sustainability
Social Equity	Social Equity	Equitable Distribution of Benefits/Impacts
Robust Economy	Economic Development	Return on Investment
All	Community Livability	Recreational Activity (Value of Time)
		Mobility Benefit (Value of Time)

Within each of the mobility objectives, the RTTAP details the analysis purpose and identifies performance measures used to achieve benefits (safety, air quality improvements, delay reductions at intersections, bicycle/sidewalk facilities, improved circulation/accessibility, monetary (economic development), equality of benefit within study area, etc. These analyses and associated performance metrics are contained within the RTTAP.

Your comment: The RTTAP is not consistent with its own objectives

Responses: GHD and COFCG work closely with City, County and Caltrans to make recommendations that were consistent with local and regional plans. Several meetings were held with both the City and County to discuss layouts, or cross-sections, of local streets and roads and consistency with local development and improvement standards.

The RTTAP does not include any capacity increasing projects. All recommendations identified in the RTTAP occur within the respective City or County right-of-way. Operational improvements, such as extending turn lane pockets or connecting a two-way left-turn lane (TWLTL), optimizing signal timing, etc., were recommended. There are no recommendations for widening roadways or adding thru lanes.

Your comment: The RTTAP does not reflect the priorities of people living within the planning area

Responses: The RTTAP identifies a collection of recommendations geared to improve overall safety and connectivity within the study area , and to address air quality and commute traffic issues through a comprehensive package of strategies . The RTTAP identifies new sidewalks and buffered bike lanes (Class II and IV), as well as gap closures for pedestrians and bicyclists. Additionally, street lighting opportunities are shown on the RTTAP Multimodal Roadway Improvements Map for urban areas. The recommended improvements & strategies if implemented, would improve the quality of life in the study area.

Your comment: The RTTAP includes incorrect information regarding the Caltrans interchange expansions on Highway 99

Responses: It is correct that improvements to the Central Avenue/SR 99 interchange are on hold at this time due to lack of funding, according to Caltrans. The RTTAP will be revised to reflect this update. According to Caltrans, however, future interchange improvements along the SR 99 corridor are anticipated at the Cedar/North interchange and American Avenue interchange. The report will be revised to reflect this update on SR 99 interchange projects.

Your comment: The RTTAP Fails to Address Significant Environmental Burdens Impacting People Living and Going to School with the Planning Area

Responses: Again, capacity improvements such as roadway widening, are not recommended in the RTTAP. To further state, projects to increase capacity for truck traffic have not been recommended as part of the RTTAP.

Finally, acceptance of the RTTAP by the Fresno COG Policy Board is planned for July 29, 2021. Due to grant funding schedule, final report must be submitted to Caltrans in August 2021. Waiting for SCSP and the Truck Reroute Study to be completed prior to accepting the RTTAP would cause unnecessary delay; the RTTAP contains data, analysis and cost estimates necessary for applying for future state and federal grant applications.

Regards,

Gary A. Mills
Project Manager

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Gary.Mills@ghd.com