Aggie Research Campus

Volume 1 – Transportation Impact Study

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1. Introduction

This study describes existing transportation conditions (environmental and regulatory) and analyzes the potential of the proposed Aggie Research Campus project (the project) to affect the surrounding transportation environment in accordance with current CEQA Guidelines. The analysis evaluates potential impacts to vehicle miles traveled (VMT) and transit, bicycle, and pedestrian components of the transportation system that may result from the proposed project, as well as impacts during project construction. Where necessary and feasible, mitigation measures are identified to reduce these impacts.

An accompanying document, the Aggie Research Campus Traffic Operations Analysis (Volume 2) presents an analysis of the potential effects of the proposed project with respect to traffic operations (i.e., vehicle delay) on roadway facilities within the vicinity of the project site. This analysis is deliberately separate from the transportation impact study in Volume 1 in accordance with the CEQA Guidelines, which no longer permit the use of vehicle delay or level of service (LOS) for the purposes of identifying environmental impacts for land use projects. This analysis has been prepared for two primary reasons. First, it informs other components of the transportation impact analysis (e.g., potential impacts to transit services) and other topics addressed in the Aggie Research Campus SEIR (e.g., air quality, noise, GHG, etc.). Second, it directly addresses the proposed project's consistency with City of Davis General Plan policies related to traffic operations and level of service.

Purpose

This impact analysis supports the Supplemental Environmental Impact Report (SEIR) prepared for the ARC project. The SEIR evaluates the extent to which changes to the project, changes to background circumstances, and/or new information would result in new significant environmental effects or a substantial increase in the severity of previously identified significant effects as described in the Mace Ranch Innovation Center (MRIC) Final Environmental Impact Report (EIR), certified by the City of Davis in September 2017. An overview of those changed conditions is described in the following section.

Changes to Project, Changes to Background Circumstances, and New Information

The following describes the meaningful changes in analysis methods, background travel conditions, environmental thresholds, and other considerations between the publication of the MRIC Final EIR and present conditions:

1. **Mace Boulevard Traffic –** The existing conditions analysis and subsequent impact analyses in the MRIC Final EIR utilized baseline traffic count data collected in October 2014. Traffic counts conducted in May and October of 2019 indicate that peak hour traffic volumes on roadways within the vicinity of the project site have increased substantially since that time, particularly during the PM peak hour. This is primarily due to increased delays and extended periods of congested conditions on eastbound I-80, diverted regional travel demand onto local roadways, the increased prevalence of navigation apps (e.g., WAZE), and changes to roadway capacity and operations, particularly modifications to the eastbound I-80 ramp meters and the four-to-two lane reduction on Mace Boulevard south of Cowell Boulevard. Therefore, the baseline traffic conditions that the project would interact with on study area roadways reflect higher levels of traffic volumes and delay than those studied in the Certified Final EIR. For example, these changed conditions affect southbound Mace Boulevard north of the interchange, a critical movement to which the project would add substantial PM peak hour travel demand. Thus, as a result, project effects may differ for various modes of travel, new travel routes may be selected, and the types of and site access improvements may change. This is discussed in more detail in Volume 2.

2. **Changes to the Project Description** – Although land uses have not technically changed, several subtle modifications to the project description for the mixed-use alternative analyzed in the MRIC EIR have occurred. This includes differing assumptions regarding the extent to which the project's housing and retail component complements its other uses, as well as modifications to project access and off-site transportation improvements. This is discussed in more detail in Chapter 3.
3. **Updated Trip Generation Rates Published by the Institute of Transportation Engineers (ITE)** – the MRIC EIR relied upon the then most recent *Trip Generation Manual*, which was the 9th edition released in 2010. The 10th edition was released in 2017. It includes several new land use categories, and material changes in trip rates for certain land use categories that are part of the proposed project.
4. **New Travel Demand Model** – In 2016, an updated travel demand model was developed as part of the UC Davis Long Range Development Plan (LDRP). This updated model covers the entire City of Davis and UC Davis campus, is calibrated to 2019 conditions, and has a 2036 horizon year. In contrast, the 2014 MRIC EIR relied upon the then most recent version of the City's travel demand model, which was originally developed in 2004.
5. **New Highway Capacity Manual (HCM)** – The 6th Edition of the HCM (Transportation Research Board, 2016) is used in this study, whereas the 2010 HCM was used in the MRIC EIR.
6. **Changes to the CEQA Guidelines** – SB 743 will go into effect statewide starting July 1, 2020. This law states that intersection level of service (or similar measures) should not be used in CEQA documents for purposes of identifying significant impacts of land use projects. Instead, Vehicle

Miles of Travel (VMT) should be used. The California Office of Planning & Research (OPR) released a *Technical Advisory on Evaluating Transportation Impacts in CEQA* in 2018 that described appropriate methods for estimating VMT, threshold setting for significance criteria, and related topics. Intersection LOS results are presented in Volume 2 for informational purposes and to help properly size project access intersections.

Analysis Scenarios

The following scenarios are analyzed in this study:

- **Existing Conditions –** Establishes the existing setting, which is used to measure the significance of project impacts.
- **Existing Plus Project Conditions –** Adds changes to travel demand resulting from buildout of the proposed project to existing conditions.
- **Cumulative No Project Conditions –** Represents cumulative travel demand based on reasonably foreseeable local and regional land use and transportation system changes. For the purposes of this study, the cumulative year is 2036. This scenario assumes the project site remains vacant.
- **Cumulative Plus Project Conditions –** Adds changes to travel demand resulting from buildout of the proposed project to Cumulative No Project conditions.

Evaluations are performed for each element of the transportation system for each of these scenarios.

2. Analysis Methodology

This section describes the methods utilized to analyze the transportation system.

Travel Demand Forecasting

This study utilized several tools to forecast travel demand changes associated with the proposed project as well as planned local and regional land use development and transportation system modifications.

The local UC Davis/City of Davis travel demand model was used for the purposes of forecasting travel demand within the City of Davis and UC Davis vicinity. This model has a base year of 2016 and forecast years of 2030 and 2036. The model was developed in close coordination with the City of Davis and UC Davis in order to incorporate planned land use and transportation system changes both within the City and its sphere of influence and on the UC Davis campus. The coordination effort included the following elements of model development:

- **TAZ system –** The traffic analysis zone (TAZ) development included review by City and UC Davis staff to ensure sufficient detail for both existing and new growth areas.
- **Land use inputs –** Inputs were initially obtained from the SACOG 2012 parcel database used in developing regional model inputs for the 2016 SACOG MTP/SCS. These inputs were reviewed for each TAZ with City and UC Davis staff to develop a complete inventory representing 2016 conditions, which is the model's base year. Similarly, land use forecasts for 2030 and 2036 conditions were developed in cooperation with City staff and UC Davis staff. Land use forecasts for 2030 and 2036 were based on future land use changes throughout the region projected in the 2016 SACOG MTP/SCS. The land use forecasts were refined based on input from City staff and UC Davis staff according to planned City of Davis General Plan growth, planned UC Davis 2018 Long Range Development Plan (LRDP) growth, approved development projects, pipeline development projects, and other reasonably foreseeable land development activities.
- **Roadway network inputs –** The local model roadway network was developed from GIS data representing local, collector, arterial, and freeway functional classifications. Input data included the number of travel lanes and free-flow travel speeds based on the previous UC Davis/City of Davis model developed for the 2003 LRDP update, plus new data from field observations and Google Maps imagery. Capacity inputs for each roadway classification were estimated from reference documents including the HCM 6th Edition and the *Travel Demand Forecasting: Parameters and Techniques, National Cooperative Highway Research Program, Report 716*,

(Transportation Research Board, 2012). Changes to the roadway networks for future year scenarios were provided by City and UC Davis staff as noted above.

- **Vehicle trip rates –** The vehicle trip rates were derived from a variety of sources including the UC Davis Campus Travel Survey, the California Household Travel Survey, local residential trip generation estimates based on observed traffic counts, and the *Trip Generation Manual*, 10th Edition. The rates were estimated for the following trip purposes.
    - Home-Based Work (HBW): trips between a residence and a workplace
    - Home-Based Shop (HBS): trips between a residence and a retail destination
    - Home-Based School (HBK): trips between a residence and a school (K-12)
    - Home-Based Other (HBO): trips between a residence and any other destination
    - Non-Home-Based (OO): trips that do not begin or end at a residence, such as traveling from a workplace to a restaurant, or from a retail store to a bank
    - College (COLL): trips to and from a Community College
    - UC Davis (UCD): trips to and from UC Davis
    - Highway Commercial (HC): trips to and from highway commercial destinations
- **Vehicle trip lengths and external trip patterns –** The vehicle trip lengths and the proportion of vehicle trips that occur exclusively within the model area versus those that have origins or destinations external to the model area were obtained from the UC Davis Campus Travel Survey, the California Household Travel Survey, and the American Community Survey. This information was extracted for each trip purpose above. Trips traveling through the model area without stopping such as those on I-80, were estimated from the regional SACOG SACSIM model developed for the 2016 SACOG MTP/SCS.
- **Trip assignment –** Trip assignment relies on conventional algorithms that assign trips between origin and destination zones based on travel times that reflect the influence of roadway capacity and speeds. A unique aspect of the assignment process is that UC Davis generated trips had to be associated with parking areas on and off-campus since that is where trips start and end. These parking areas were mapped in collaboration with UC Davis staff and iterative testing of the assignment results was used to refine the association.

Consistent with standard practice, the base year model was calibrated and then validated against actual travel conditions present in 2016. The model passed all applicable validation tests.

Vehicle Miles Traveled (VMT)

This study uses vehicles miles traveled (VMT) as the primary metric for transportation impacts. By definition, one VMT is defined as a motor vehicle being driven one mile. VMT is expressed on a daily basis, and in this context, for a typical weekday. VMT values in this study represent the full length of a given trip, and are not truncated at city, county, or region boundaries.

This analysis uses the VMT per service population metric for the purposes of analyzing potential impacts to VMT. This methodology calculates VMT by summing the "VMT from" and "VMT to" a specified area. The VMT accounting is:

$$VMT = (II + IX) + (II + XI) = (2 \times II) + IX + XI$$

- Internal-internal (II): The full length of all trips made entirely within the geographic area limits is counted.
- Internal-external (IX): The full length of all trips with an origin within the geographic area and destination outside of the area is counted.
- External-internal (XI): The full length of all trips with an origin outside of the geographic area and destination within the area is counted.

The intra-zonal VMT and VMT between traffic analysis zones, or TAZs, that are both in the study area are double counted. To cancel out the double counting, the VMT is divided by the service population (residential population plus employment population), the generators of both trip ends of the VMT. This is necessary when expressing VMT as an efficiency metric that also represents the VMT generation rate of the service population. The resulting VMT is then compared to the existing VMT and a determination made as to whether the project VMT exceeds the applicable thresholds.

VMT estimates were prepared utilizing the UC Davis/City of Davis travel demand model, SACOG's SACSIM travel demand model, and the California Statewide Travel Demand Model. For project-generated VMT calculations, the following calculations were performed:

- Project-Generated VMT = project's estimated weekday external vehicle trips x average trip length

The average trip lengths were derived from the UC Davis/City of Davis travel demand model, with extra distance appended to project trips with trip ends outside of that local model's boundaries using the SACMET travel demand model and the California Statewide Travel Demand Model (e.g., to capture longer trips to/from the Bay Area that would not otherwise be reflected in the local model).

The following process was employed to prepare estimates for VMT generated at the local and regional level:

- **Local VMT generated by the City of Davis and UC Davis –** The UC Davis/City of Davis travel demand model was used to estimate VMT associated with trips ends within the model boundaries (i.e., the City of Davis sphere of influence and the UC Davis campus). This model was selected for this purpose due to its smaller TAZ structure relative to other available travel demand models, which allows for a more granular evaluation of trips internal to the model boundaries (i.e., to avoid underreporting VMT associated with internal-internal trips associated with a given TAZ). Extra distance was added to trips with trip ends outside of the local model boundaries using the SACSIM travel demand model and the California Statewide Travel Demand Model. Land use inputs for the TAZ containing the project site were calibrated to match the estimated (for Existing Plus Project and Cumulative Plus Project conditions) daily trip generation associated with the project site based on the project trip generation estimates described in the Project Travel Characteristics section.
- **Regional VMT generated by the SACOG region –** The SACSIM travel demand model, prepared by SACOG for regional travel demand forecasting purposes, was utilized to estimate VMT associated with trips with trip ends within the model boundaries (i.e., the SACOG region). Extra distance was added to trips with trip ends outside of the SACSIM model boundaries (e.g., based on actual distance from edge of model to destinations within Solano or Napa Counties, for instance) using the California Statewide Travel Demand Model. VMT associated with SACSIM trips with trip ends within the City of Davis sphere of influence or the UC Davis campus were deleted and replaced with the VMT calculated from the UC Davis/City of Davis travel demand model as described in the previous step.

3. Environmental Setting

This section describes the existing environmental setting, which is the baseline scenario upon which project-specific impacts are evaluated. The environmental setting components include roadway, pedestrian, bicycle, and transit networks in the vicinity of the project site.

Project Location

The proposed project site is located in unincorporated Yolo County immediately east of the City of Davis city limits. The project site is situated east of Mace Boulevard and north of Interstate 80 (I-80) near the "Mace Curve". The project site is located approximately three miles east of Downtown Davis and the University of California, Davis (UC Davis) campus and approximately ten miles west of Downtown Sacramento. The project site is bordered on the west by Mace Boulevard, on the south by County Road 32A (CR 32A), and agricultural fields on the north and east. **Figure 1** displays the project site and surrounding roadway network.

Roadway System

Mace Boulevard, Alhambra Drive, CR 32A, and County Road 30B/104A (CR 30B/104A) provide vehicular access to the project site. Other key roadways in the project vicinity include East Covell Boulevard, Second Street, and Interstate 80. These roadways are described below.

Interstate 80 (I-80) is an east-west interstate freeway near the southern boundary of the project site. From Davis, I-80 connects with the San Francisco Bay Area to the west and Sacramento and the Lake Tahoe Basin to the east. I-80 provides three travel lanes per direction in the vicinity of the project site. I-80 serves Davis via interchanges at Mace Boulevard and Richards Boulevard, as well as a westbound off-ramp at Olive Drive. Additional I-80 interchanges within the vicinity of Davis include the Old Davis Road interchange at the UC Davis campus and the County Road 32A interchange in Yolo County. I-80 and its interchanges are owned and operated by Caltrans.

Mace Boulevard is a two- to four-lane north-south major arterial that borders the west edge of the project site. The roadway provides four lanes south of Alhambra Drive and transitions to two lanes separated by a striped median north of Alhambra Drive, where it becomes East Covell Boulevard. The speed limit is 40 miles per hour (mph).

East Covell Boulevard is a four-lane east-west major arterial that connects Mace Boulevard at Alhambra Drive to State Route 113 and points west. West of the project site, East Covell Boulevard has a posted speed limit of 40 mph from Mace Boulevard to Wright Boulevard.

Alhambra Drive is a two-lane minor arterial that connects Mace Boulevard to East Covell Boulevard. The speed limit is 30 mph.

County Road 32A (CR 32A) is a two-lane east-west minor arterial that borders the south side of the project site. There is an advisory 35 mph speed signed along the curve adjacent to the project site; on the rest of the roadway, the speed limit is 55 mph except for the curve near the railroad grade crossing. The roadway has soft shoulders and bike lanes. West of Mace Boulevard, CR 32A becomes Second Street. CR 32A is owned and operated by Yolo County.

Second Street is a two- to four-lane east-west minor arterial connecting Mace Boulevard to L Street and Downtown Davis. The speed limit in the project vicinity is 35 mph.

County Road 30B/104A (CR 30B/104A) is a two-lane roadway that connects East Covell Boulevard to CR 105 northeast of the project site. There are no speed limit signs in the project vicinity, so the assumed prima facie speed limit is 55 mph. There is an advisory 15 mph sign at the curve located north of the project site. The roadway has soft shoulders, and no sidewalks or bike lanes are provided.

Refer to Volume 2 (Traffic Operations Analysis) for an analysis of the existing peak hour operations of these roadway facilities.

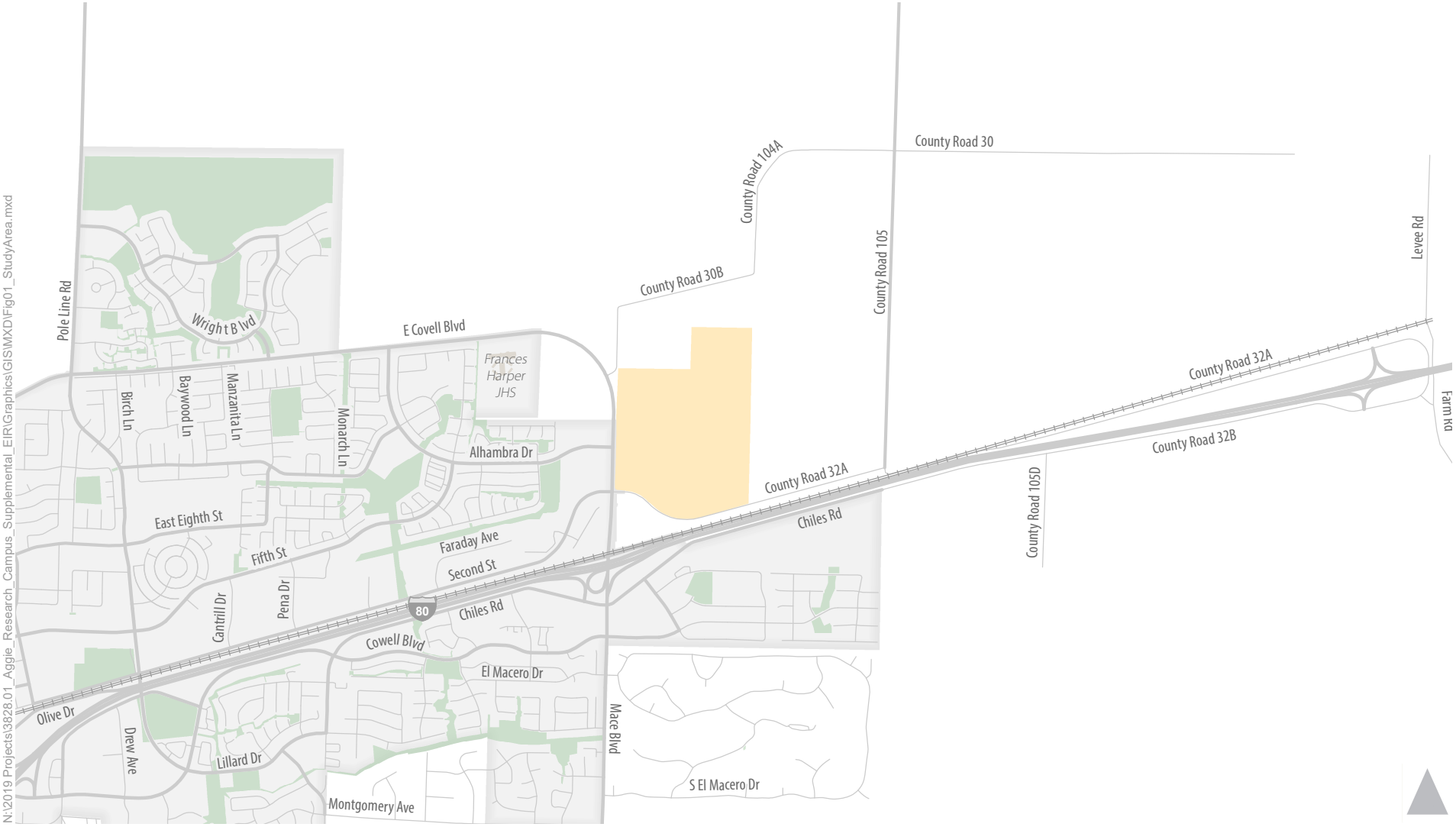


Figure 1

Study Area

Pedestrian Facilities

The City of Davis has an extensive system of off-street shared-use paths, sidewalks, and crosswalks available for use by pedestrians. Sidewalk coverage on the key roadways in the project vicinity is discussed in the Roadway System section above. In addition, the following shared-use paths are located in the vicinity of the proposed project site:

- East-west path situated between I-80 and the Union Pacific main line, beginning at the eastern terminus of Olive Drive and terminating at CR 105. Users of this path continue east to the causeway bike path;
- East-west path on the south side of East Covell Boulevard to an eastern terminus point at the eastern boundary of Harper Junior High School, approximately 2,500 feet north of the Mace Boulevard/Alhambra Drive intersection. A grade-separated bicycle crossing underneath East Covell Boulevard east of Monarch Lane connects this path to a complementary path on the north side of East Covell Boulevard towards Wildhorse;
- East-west path on both sides of Alhambra Drive between Mace Boulevard and Fifth Street;
- East-west path paralleling Arroyo Avenue with connections to the Fifth Street path to the west and the Alhambra Drive path (via John Barovetto Park) to the east. This path also provides a connection to the Dave Pelz Bicycle Overcrossing, which connects Mace Ranch and South Davis over I-80 and the Union Pacific main line;
- The approximately 12-mile Davis Bike Loop, which passes through Mace Ranch Park. The City-wide bike loop is a combination of on-street bicycle facilities and off-street shared-use paths; and
- Several internal paths in the Mace Ranch neighborhood.

Additionally, the site plan for the Offices @ Mace Ranch project (located at the northwest corner of the Mace Boulevard/Alhambra Drive intersection) includes a path along its frontages of Mace Boulevard and Alhambra Drive. This project is currently under construction and scheduled for completion in 2020.

Pedestrian facilities do not exist along the proposed project site boundaries as the land is currently undeveloped. The signalized intersection of Mace Boulevard/Second Street/CR 32A, located at the southwest corner of the proposed project site, has crosswalks with pedestrian push buttons on all four legs, but there is no connecting sidewalk on the site frontages to the north and east. The signalized intersection of Mace Boulevard/Alhambra Drive, located on the proposed project's western edge, has a crosswalk only on the west leg (crossing Alhambra Drive). There are no pedestrian facilities on the access road to the Park-and-Ride lot southwest of the proposed project site.

Bicycle Facilities

The project site is situated on the edge of the City of Davis bicycle network, which is comprised of an extensive network of on- and off-street bicycle facilities. Bicycle facilities are typically categorized in the following classifications:

- **Class I Multi-Use Off-Street Paths** (also known as shared-use paths) are paved trails that are separated from roadways and allow for shared use by both cyclists and pedestrians.
- **Class II On-Street Bike Lanes** are designated for use by bicycles by striping, pavement legends, and signs.
- **Class III On-Street Bike Routes** are designated by signage for shared bicycle use with vehicles but do not necessarily include any additional pavement width for bicyclists.
- **Class IV Separated Bikeways** (also known as protected bikeways or cycle tracks) are separated bikeways improve upon buffered bike lanes by providing vertical separation between bike lanes and the adjacent travel lanes. Vertical separation can be provided with concrete curb and gutter, bollards or on-street parking.

Figure 2 displays existing bicycle facilities in the proposed project vicinity. In addition to the previously discussed shared-use paths, on-street bicycle facilities are located on the following roadways near the proposed project site:

- Class II Bike Lanes
    - Mace Boulevard in both directions from East Covell Boulevard to Cowell Boulevard;
    - East Covell Boulevard from Mace Boulevard to the westerly city limits;
    - Alhambra Boulevard in both directions from Mace Boulevard to East Covell Boulevard;
    - CR 32A in both directions from Mace Boulevard to CR 32B; and
    - Second Street from Mace Boulevard to L Street.
- Class IV Separated Bikeways
    - Mace Boulevard from Cowell Boulevard to Redbud Drive, including one-way separated bikeways on both sides of the roadway between Cowell Boulevard San Marino Drive and a two-way separated bikeway on the west side of the roadway between San Marino Drive and Redbud Drive.

East Covell Boulevard, which becomes Mace Boulevard along the proposed project frontage, is the only continuous east-west arterial that traverses the entire City of Davis. To facilitate bicycle and pedestrian travel across this high-volume facility, the City of Davis has required the construction of bicycle/pedestrian grade separations for new developments located on the north side of Covell Boulevard. Existing grade separations on Covell Boulevard are located west of F Street, east of F Street (to/from The Cannery), and east of Monarch Lane. A future facility is planned on West Covell east of Denali Drive, as shown in the *City of Davis General Plan*.

Transit Service and Facilities

Transit serving the project site includes local bus service connecting the project site to destinations throughout the City of Davis (e.g., Downtown Davis, the Davis Train Depot, etc.) and the UC Davis campus. Additionally, the project site is served by intercity bus service that is primarily oriented towards serving Davis residents commuting to and from work in Downtown Sacramento.

Transit service in the City of Davis is provided by Unitrans (local bus), Yolobus (intercity bus), Amtrak (intercity rail), and Davis Community Transit (local paratransit):

- **Unitrans** provides local fixed route bus service to the project site. Jointly operated between the Associated Students, UC Davis (ASUCD) and the City of Davis, Unitrans offers 19 routes serving the UC Davis campus and City of Davis neighborhoods, shopping centers, schools, and medical centers. Unitrans operates as a radial bus system with the UC Davis campus serving as the central hub. The main terminals on the UC Davis campus are at the Memorial Union on Howard Way and at the Silo along Hutchison Drive.

  Specific service spans and frequencies vary by route. Generally, Unitrans operates from 6:30 a.m. to 11:30 p.m. Monday through Thursday and until 9:00 p.m. on Fridays. Weekend service is available from 8:30 a.m. to 7:00 p.m. Unitrans routes operate every 15 or 30 minutes during weekdays and every 60 minutes during weekends and evenings. **Table 1** summarizes the weekday and weekend frequency and span for Unitrans bus routes serving the project site.

  The current Unitrans one-way fare is $1.25, with monthly, quarterly, and annual passes available at a discounted price. Free rides are available to UC Davis undergraduate students (fee assessed quarterly with registration), seniors, disabled passengers, City of Davis employees, and transferring Sacramento Regional Transit, Yolobus, Capitol Corridor, and Fairfield Transit passengers.

Table 1: Unitrans Route Summary – Project Site Vicinity

Route	Weekday (M-Th)		Friday		Weekend	
	Peak Frequency (min)	Span	Peak Frequency (min)	Span	Peak Frequency (min)	Span
A – Silo/Amtrak/5th/Alhambra	30	7 a.m. to 11 p.m.	30	7 a.m. to 9 p.m.	--	--
O – MU/Amtrak/5th/Alhambra/Target	--	--	--	--	60	9 a.m. to 7 p.m.
P – MU/Davis Perimeter Counter Clockwise	30	6 a.m. to 11 p.m.	30	6 a.m. to 9 p.m.	60	8 a.m. to 7 p.m.
Q – MU/Davis Perimeter Clockwise	30	6 a.m. to 11 p.m.	30	6 a.m. to 9 p.m.	60	8 a.m. to 7 p.m.
Z – MU/Amtrak/Cantrill/5th	30	7 a.m. to 7 p.m.	30	7 a.m. to 7 p.m.	--	--

Source: Unitrans, 2020.

- **Yolobus** provides fixed route bus and paratransit service throughout Yolo County, as well as commuter bus service to downtown Sacramento. Single rides are available for $2.25 and $3.25 for local and express services, respectively. Discounted daily and monthly passes are also available.

  Local bus routes serving the project site include Routes 42A and 42B, which provide clockwise/counterclockwise loop service between Davis, Woodland, Sacramento International Airport, Downtown Sacramento, and West Sacramento on hourly headways. Express bus routes serving the project site include Routes 43 and 232, both of which are oriented towards serving Davis residents working in Downtown Sacramento (i.e., morning service is eastbound-only and afternoon/evening service is westbound-only).

- **Amtrak** serves the Davis Transit Depot near Second and G Streets in downtown Davis, approximately three miles west of the project site. Amtrak Capitol Corridor service is available at the depot, connecting passengers to Sacramento and Roseville to the east and the Bay Area to the west. Currently, 15 daily Capitol Corridor round-trips are available at the station during regular weekday service. In addition to regular Capitol Corridor service, Amtrak serves the Davis Transit Depot with daily Coast Starlight service (to Los Angeles and Seattle) and intercity bus connections to other Amtrak rail lines (e.g., the Amtrak San Joaquin lines at Sacramento Valley Station).

UC Davis, together with operating partners Yolobus and the Sacramento Regional Transit District, is launching the Causeway Connection bus service in April 2020. This service will connect the UC Davis main campus in Davis and the UC Davis Health Campus in Sacramento, replacing the existing inter-campus

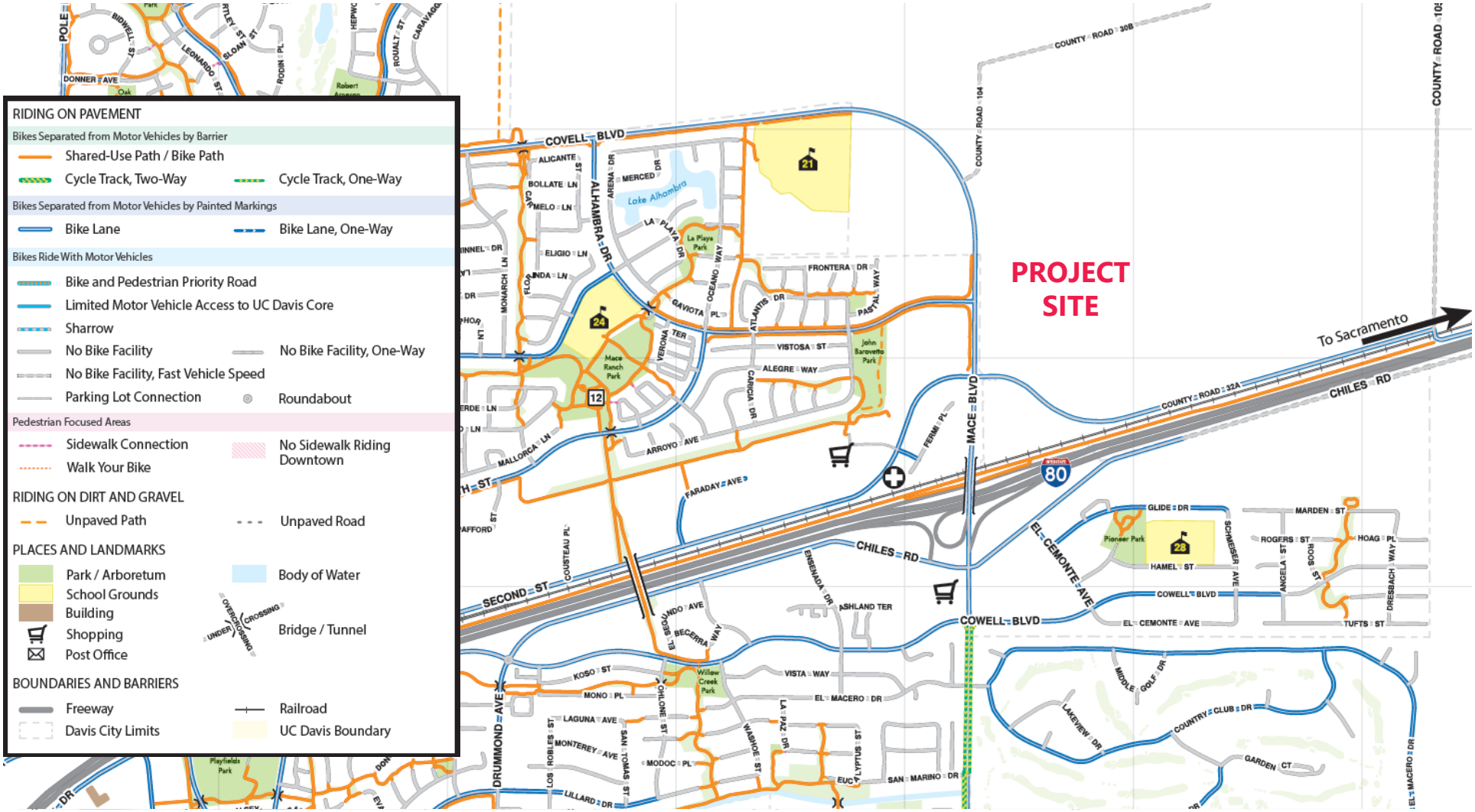
shuttle. The planned schedule identifies the Mace park-and-ride as a stop for select eastbound trips in the morning and westbound trips in the evening. The park-and-ride will be served hourly during peak periods.

Figure 3 displays the bus stops and routes serving the project site vicinity. The primary bus stops serving the project site are located at the Mace park-and-ride, on southbound Mace Boulevard midblock between Alhambra Drive and Second Street, and on northbound Mace Boulevard immediately north of Second Street.

Rail Transportation

Union Pacific Railroad Company (UPRR) operates a railroad line that runs east-west through the City of Davis. The railroad tracks border the western edge of the project site and are grade-separated with Mace Boulevard. At-grade crossings exist to the south within the study area at County Road 105. The rail crossing includes advanced warning signs, pavement markings, and highway stop signs. According to the Federal Railroad Administration[1], this line is used by an average of 53 trains per day, including freight trains and Amtrak passenger trains. Yolo County, together with UPRR and the City of Davis, is currently evaluating potential modifications to the County Road 105 at-grade crossing to reduce the potential for conflicts with rail operations.

[1] http://safetydata.fra.dot.gov/officeofsafety/publicsite/crossing/xingqryloc.aspx



Source: Davis Bike Map, City of Davis

Figure 2

Existing Bicycle Facilities

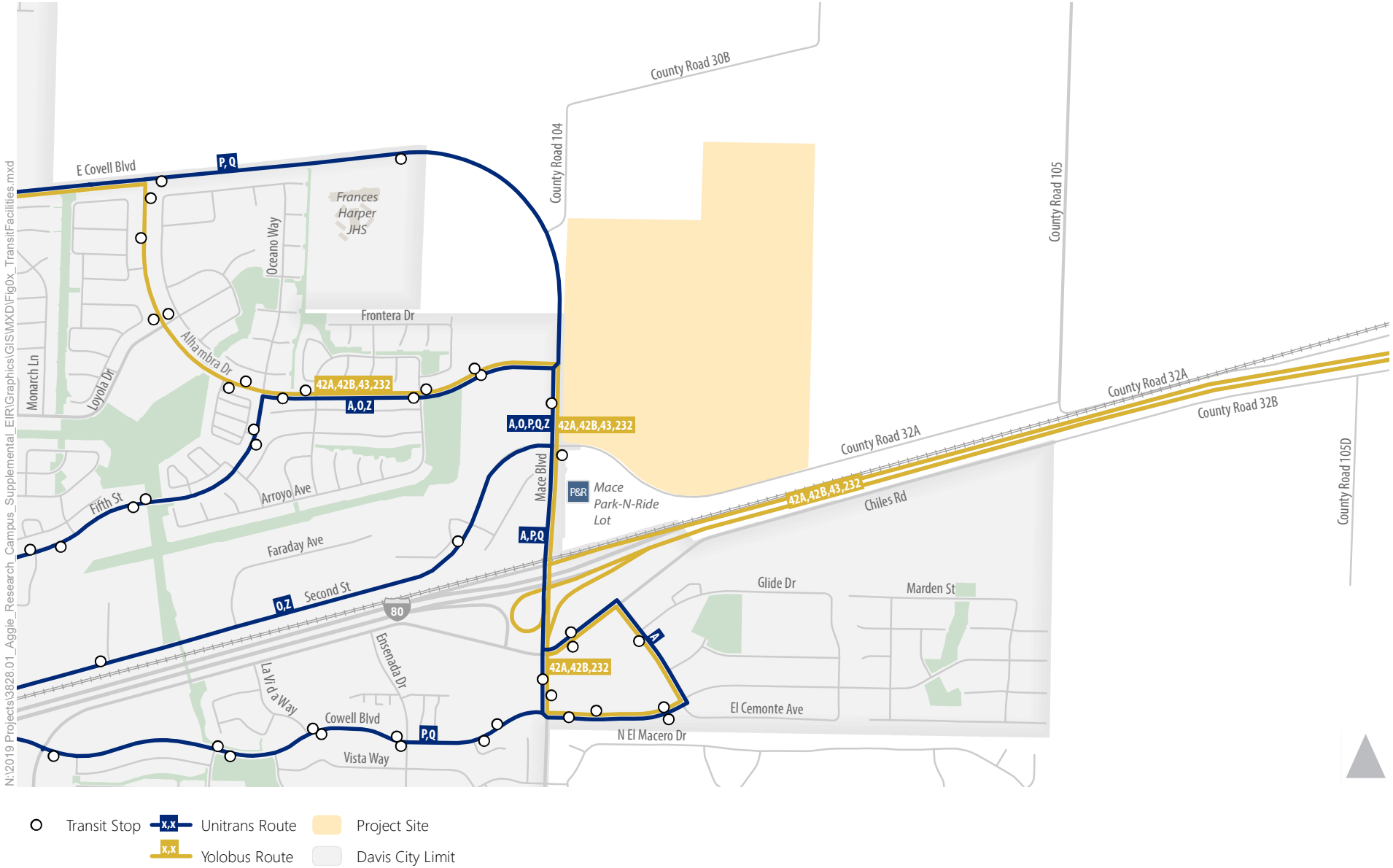


Figure 3

Existing Transit Service and Facilities

4. Regulatory Setting

Existing transportation policies, laws, and regulations that would apply to the project are summarized below. This information provides a context for the impact discussion related to the project's consistency with applicable regulatory conditions and development of significance criteria for evaluating project impacts.

State

California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for planning, designing, constructing, operating, and maintaining the State Highway System (SHS). Federal highway standards are implemented in California by Caltrans. Any improvements or modifications to the SHS within the study area would need to be approved by Caltrans.

Caltrans' Local Development – Intergovernmental Review Program (LD-IGR) provides guidance on the evaluation of traffic impacts to State highway facilities. In light of Senate Bill 743 (discussed below) and related changes to the CEQA Guidelines, Caltrans has announced in its *Caltrans Draft VMT-Focused Transportation Impact Study Guide* (Caltrans, February 2020) that it will use VMT as the CEQA transportation impact metric for projects on the State highway system and has indicated it will rely on the Governor's Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA* when preparing LD-IGR comments on local agency land use projects.

Senate Bill 743

Senate Bill 743 (Stats. 2013, ch. 386) (SB 743) creates or encourages several statewide CEQA improvements. First, it requires OPR to establish new metrics for determining the significance of transportation impacts of projects within transit priority areas (TPAs) and allows OPR to extend use of the metric beyond TPAs. OPR selected vehicle miles of travel (VMT) as the preferred transportation impact metric and applied their discretion to require its use statewide. Second, it establishes that aesthetic and parking impacts of a residential, mixed-use residential, or employment center projects on an infill site within a TPA shall not be considered significant impacts on the environment. Third, once the new CEQA Guidelines go into effect, which occurred on April 27, 2019, vehicle LOS and similar measures related to delay shall not be used as the sole basis for determining the significance of transportation impacts. Finally, it establishes a new CEQA exemption for a residential, mixed-use, and employment center project a) within a transit priority area, b) consistent with a specific plan for which an EIR has been certified, and c)

consistent with a Sustainable Communities Strategy. This exemption requires further review if the project or circumstances changes significantly.

Local

City of Davis General Plan

The *City of Davis General Plan* Transportation Element was last updated in 2013. The following goals and policies related to transportation and circulation are applicable to the project. Most of the listed goals and policies are relevant at a project-level scale, versus City-wide.

Goal #1: Davis will provide a comprehensive, integrated, connected transportation system that provides choices between different modes of transportation.

Performance Objective #1.1: Achieve at least the following mode share distribution for all trips by 2035:

- 10% of trips by walking
- 10% of trips by public transportation
- 30% of trips by bicycle

Performance Objective #1.2: Increase use of walking, bicycling, and public transportation to and from the following places:

- Work
- Schools (elementary, junior high, and senior high)
- UC Davis,
- Downtown

Goal #2: The Davis transportation system will evolve to improve air quality, reduce carbon emissions, and improve public health by encouraging usage of clean, energy-efficient, active (i.e. human powered), and economically sustainable means of travel.

Performance Objective #2.1: Reduce carbon emissions from the transportation sector 61 percent by 2035.

Performance Objective #2.2: Reduce vehicle miles traveled (VMT) by 39 percent by 2035.

Performance Objective #2.3: Annually increase funding for maintenance and operation needs of the transportation system, until fully funded.

Goal #3: Davis will provide a safe and convenient Complete Streets network that meets the needs of all users, including children, families, older adults, and people with disabilities.

Performance Objective #3.1: Improve the quality of service for all users of the transportation system.

Performance Objective #3.2: Reduce the total number of collisions between motor vehicles and bicyclists or pedestrians by 50% by 2035.

Goal #4: Davis will strengthen its status as a premier bicycling community in the nation by continuing to encourage bicycling as a healthy, affordable, efficient, and low-impact mode of transportation accessible to riders of all abilities, and by continuously improving the bicycling infrastructure.

Performance Objective #4.1: Commit a minimum amount of funding for bicycle programming and infrastructure as identified in the "Beyond Platinum – Bicycle Action Plan".

Policy TRANS 1.6: Reduce carbon emissions from the transportation system in Davis by encouraging the use of non-motorized and low carbon transportation modes.

Policy TRANS 1.7: Promote the use of electric vehicles and other low-polluting vehicles, including Neighborhood Electric Vehicles (NEV).

Policy TRANS 2.1: Provide Complete Streets to meet the needs of drivers, public transportation vehicles and riders, bicyclists, and pedestrians of all ages and abilities in all transportation planning, programming, design, construction, reconstruction, retrofit, operations, and maintenance activities and products. The City shall view all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in Davis, and recognizes bicycle, pedestrian, fixed-route transit, and demand-response para-transit modes as integral elements of the transportation system along with motor vehicles. This policy also includes the following language pertaining to automobile level of service:

- LOS D or better is acceptable during non-peak traffic hours.
- LOS E or better is acceptable during peak traffic hours.
- LOS F is acceptable during peak traffic hours in the Core Area and Richards Boulevard/Olive Drive area.
- LOS F is acceptable during peak traffic hours in other areas if approved by City Council.

Action TRANS 2.1(i): Establish a multi-modal Level of Service (LOS) standard to address the needs of all users of the street, including bicyclists and pedestrians, at intersections.

Action TRANS 2.1(k): Work with citizens and technical experts to review the street width and "Greenstreet" standards to reflect pedestrian and bicycle friendly policies in this chapter, including but not limited to the following:

- Design/redesign residential and collector streets to slow vehicular traffic to 25 mph or less.
- Design travel lanes to prioritize pedestrians and bicycles, including provisions for a marked "buffer space" to further separate bicycles from both moving and parked motor vehicles, where right-of-way allows.
- Eliminate intersection standards that allow high speed right turns for motor vehicles.
- Adjust intersection signal operations to smooth traffic flow, reduce automobile idle time, and to adequately service bicycles and pedestrians by giving priority and to maintain momentum.

Roadways within the study area with a Greenstreet designation include Mace Boulevard, Covell Boulevard, Second Street, Chiles Road, Cowell Boulevard, and Pole Line Road.

Action TRANS 2.1(l): Preserve rights-of-way for future transportation use.

Action TRANS 2.1(m): Ensure transit stops have adequate curb space for loading and unloading passengers.

Policy TRANS 2.2: Implement state-of-the-art street design solutions to improve bicycle/pedestrian access, comfort, and safety that may include:

- Bicycle boxes at intersections
- Cycletracks
- Shared lane markings (sharrows)
- Contraflow bicycle lanes
- Improved bicycle detection at intersections
- Two-stage turn queue boxes
- Colored bicycle lanes
- Bicycle route wayfinding

Policy TRANS 2.3: Apply best practices in sustainability to new streets and redesigns of existing streets/corridors.

Policy TRANS 2.4: As part of the initial project review for any new project, a project-specific traffic study may be required. Studies shall identify impacted transportation modes and recommend mitigation measures designed to reduce these impacts to acceptable levels.

Policy TRANS 2.5: Create a network of street and bicycle facilities that provides for multiple routes between various origins and destinations.

Policy TRANS 2.7: Minimize impacts of vehicle traffic on local streets to maintain or enhance livability of the neighborhoods. Consider traffic calming measures along collector and minor arterial streets, where appropriate and feasible, to slow speeds.

Policy TRANS 2.8: Improve the function, safety, and appearance of selected corridors as illustrated.

Action: Develop "corridor plans" for selected streets which warrant special treatment because of existing impact problems or operational issues. Corridor plans should take into consideration adjacent land uses and result in streets that are both functional and aesthetic. The plans should utilize innovative means of slowing traffic, where appropriate, and provide safe access for pedestrians and bicyclists. Mitigation shall be incorporated to protect residences and sensitive receptors from noise, air pollution and other traffic related impacts. The corridor plans may deviate from the standards established in the General Plan, if deviates improve the livability of the area. Covell Boulevard from SR 113 to the west City limit is included in this program.

Policy TRANS 2.10: Prohibit through truck traffic on streets other than identified truck routes shown in the Transportation Element.

Policy TRANS 3.1: Facilitate the provision of convenient, reliable, safe, and attractive fixed route, commuter, and demand responsive public transportation that meets the needs of the Davis community, including exploring innovative methods to meet specialized transportation needs.

Policy TRANS 3.3: Require new development to be designed to maximize transit potential.

Policy TRANS 4.2: Develop a continuous trails and bikeway network for both recreation and transportation that serves the Core, neighborhoods, neighborhood shopping centers, employment centers, schools and other institutions; minimize conflicts between pedestrians, bicyclists, equestrians, and automobiles; and minimize impacts on wildlife. Greenbelts and separated bike paths on arterials should serve as the backbone of much of this network.

Policy TRANS 4.3: Continue to build transportation improvements specifically targeted at bicycles. Refer to Bicycle Plan and Transportation Implementation Plan for list of bicycle-related projects.

Policy TRANS 4.5: Establish and implement bicycle parking standards for new developments and significant redevelopment.

Policy TRANS 4.7: Develop a system of trails around the edge of the city and within the city for recreational use and to allow pedestrians and bicyclists to reach open space and natural areas.

Policy TRANS 5.1: Use parking management techniques to efficiently manage motor vehicle parking supply and promote sustainability.

Policy TRANS 5.2: Existing and future off-street parking lots in development should contribute to the quality of the urban environment and support the goals of this chapter to the greatest extent possible.

Beyond Platinum – City of Davis Bicycle Action Plan

This document included discussions regarding goals and objectives, bicycle facility guidelines, engineering standards, and implementation and funding. The Plan was heard before and adopted by the City Council in February 2014. This document includes numerous goals and policies regarding enforcement, education, and engineering design. The following policies are particularly relevant to this study:

Goal: Provide bike lanes along arterial and collector streets. Provide separated bike paths adjacent to arterial and collector streets only where justified, with full consideration of the potential safety problems this type of facility can create.

Goal: Consider bicycle-operating characteristics in the design of bikeways, intersections, and traffic control systems.

In addition, Appendix C of this document shows a variety of proposed bicycle facilities throughout the City, including the following proposed bicycle facility enhancements within the vicinity of the project site:

- Buffered bike lanes on Second Street between Mace Boulevard and L Street
- Bike lane conflict markings and bike intersection crossing markings on Mace Boulevard at the I-80 interchange ramps

Sacramento Area Council of Governments

The Sacramento Area Council of Governments (SACOG) is responsible for the preparation of, and updates to, its Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) and the corresponding Metropolitan Transportation Improvement Program (MTIP) for the six-county Sacramento region. The MTP/SCS provides a 20-year transportation vision and corresponding list of projects. The MTIP identifies short-term projects (seven-year horizon) in more detail. The current 2020 MTP/SCS was adopted by the SACOG board in 2019. The accompanying EIR certified by the SACOG board is currently under legal challenge. The previous MTP/SCS was adopted by the SACOG board in 2016.

5. Project Travel Characteristics

This chapter describes the expected travel characteristics of the proposed project. These characteristics will be used in the development of the Existing Plus Project condition. The Cumulative Plus Project condition will also use many of these same estimates, but will additionally consider changed conditions in the vicinity of the project site (e.g., buildout of nearby planned and approved development) between the two scenarios.

Project Description

The proposed ARC project would consist of a mix of land uses including office/R&D, advanced manufacturing, ancillary retail, residential, and a hotel on 194 acres. The project is anticipated to be built out gradually in four phases over twenty to twenty-five years. **Table 2** presents the buildout development program for the project as proposed by the project applicant.

Table 2: Aggie Research Campus Project – Proposed Land Use Program

Land Use	Units[1]	Buildout Quantities
Office/R&D	KSF	1,510
Advanced Manufacturing	KSF	884
Hotel/Conference	Rooms/KSF	150/160
Ancillary Retail[2]	KSF	100
Total Non-Residential Development	**KSF**	**2,654**
Single-Family Residential	DU	280
Multi-Family Residential	DU	570
Total Residential Development	**DU**	**850**

Notes: [1] KSF = Thousand Square Feet of floor space. DU = Dwelling Unit.
[2] Ancillary retail, as defined in the ARC project description, is intended to provide employees, residents, and visitors with basic conveniences such as: lodging/accommodations, health and fitness center, convenient coffee, and dining opportunities all located within walking distance of the Project's primary businesses and workforce housing uses.
Source: Aggie Research Campus Project Description, October 2019.

The proposed project also includes additional development of the Mace Triangle located on the property bounded by Mace Boulevard, CR 32A, and the Union Pacific railroad tracks. The Mace Triangle development would include 46,000 square feet of office/R&D and 25,000 square feet of ancillary retail.

The proposed project would include the following vehicular access points:

- Full access via existing signalized intersection at Mace Boulevard/Alhambra Drive. The project would construct a new fourth leg (east leg) at the intersection. The project site plan shows the construction of channelized right-turns for the northbound and westbound approaches.
- Full access via a connection from County Road 30B immediately east of its existing unsignalized full access intersection with Mace Boulevard.
- Partial access (right-in/right-out only) on Mace Boulevard between Alhambra Drive and County Road 30B. This would be a new unsignalized intersection with an east leg serving the project site.
- Full access on County Road 32A at the existing unsignalized intersection with the existing driveway to the Mace park-and-ride. The project would construct a new fourth leg) north leg at the intersection.
- Full access on County Road 32A at a new project roadway located east of the existing driveway to the Mace park-and-ride. This would be a new unsignalized intersection with a north leg serving the project site.

According to the ARC Project Description, the project would also include the following on- and off-site transportation infrastructure and programs:

- Three east-west and two north-south internal roadways.
- Approximately 2.25 miles of on-site paths for bicyclists and pedestrians.
- On-site Transit Plaza with dedicated Unitrans bus stops, dedicated pick-up/drop-off facilities for ridehailing services (e.g., Uber and Lyft), and accommodations for a dedicated ARC shuttle that would connect the project site with off-site destinations in the City of Davis and on the UC Davis campus.
- Construction of a new grade-separated bicycle and pedestrian crossing of Mace Boulevard located near the Mace Drainage Channel (north of Alhambra Drive).
- Construction of a new Class I shared-use path on the inside of the Mace Curve between the new grade-separated bicycle and pedestrian crossing and Harper Junior High School.
- Construction of a landscaped pedestrian connection between the project site and the existing Mace park-and-ride.
- Up to 5,858 on-site vehicle parking spaces, to be built gradually as warranted by on-site parking demand.
- TDM strategies such as carpooling, bus transit, shuttles, carshare, and other smart phone technologies to assist in providing transportation options for employees.
- Support for a Transportation Manager who will coordinate transportation options for the site and help to facilitate the use of alternative modes for all workers and residents.

- Provision of bicycle support facilities such as bicycle racks, storage lockers, a repair station, and showers to encourage and help establish the use of bicycles as a predominant mode of transportation to the site.

Details regarding the nature, timing, funding, and implementing/operating responsibility of the transit services and TDM strategies described above are not provided in the ARC Project Description or supporting materials. Therefore, their potential associated effects on project travel characteristics cannot be quantified, and are thus not included in the analysis described below.

Methodology

Prior to 2007, conventional methods available to transportation engineers systematically overestimated the trips generated by and impacts of mixed-use development because they did not accurately reflect the amount of internal trip making or the level of external trips made by transit, biking, and/or walking. This resulted in increased development costs, due to oversized infrastructure, skewed public perception, and resistance to approving smart growth. While the Institute of Transportation Engineers (ITE) Trip Generation Handbook (2017) does include a methodology for estimating internal trips, methods are only provided for AM and PM peak hour conditions, and not for the most critical daily condition (which is a needed input for VMT estimation which is a daily metric).

In the early 2000's, two significant research studies provided the opportunity to improve the state of practice. One study sponsored by the US EPA (MXD) and another by the Transportation Research Board (NCHRP 684) have developed means to improve trip generation estimation for mixed-use development (MXD). The two studies examined over 240 mixed-use development sites throughout the U.S. and, using different approaches, developed new quantification methods. Fehr & Peers has reviewed the two methods, including the basis, capabilities, and appropriate uses of each, to produce a new method (MXD+) that combines the strengths of the two individual tools to establish a new best practice. MXD+ recognizes that traffic generation by mixed-use and other forms of sustainable development relate closely to the density, diversity, design, destination accessibility, transit proximity, and scale of development.

The MXD+ method explains 97 percent of the variation in trip generation among mixed-use developments, compared to 65 percent for the methods previously recommended by ITE. While remaining slightly (2 to 4 percent) conservative to avoid systematically understating impacts, it substantially reduces the 35 to 37 percent average overestimate of traffic generation produced by conventional ITE methods.

Fehr & Peers has applied MXD+ on hundreds of EIRs throughout California over the past decade, including EIRs for several projects in the City of Davis such as The Cannery and the West Davis Active Adult Community.

Project Trip Generation

Table 3 summarizes the estimated weekday and peak hour trip generation for the ARC project using the MXD+ tool. As shown in this table, the ARC project would generate an estimated 23,888 new external daily vehicle trips, 2,232 new external AM peak hour vehicle trips, and 2,479 new external PM peak hour vehicle trips during a typical weekday. The Mace Triangle would generate an estimated 762 new external daily vehicle trips, 93 new external AM peak hour vehicle trips, and 82 new external PM peak hour vehicle trips during a typical weekday.

The following factors influence the estimated trip reductions resulting from internalization and shifts to transit, walk, and bike trips:

- Suburban location on the edge of the developed area
- Low-density surroundings
- Low on- and off-site intersection density, which is a proxy for walkability within the site and overall internal trip-making
- Poor walk/bike access to off-site trip generators/activity centers, particularly due to long travel distances[2]
- Poor intercity/commuter transit access for project employees. Adjacent intercity transit routes are currently designed to serve Davis residents working in Sacramento, but not the 'reverse commute' in the opposite direction.
- High jobs/population ratio (approximately 2.78 jobs for every resident), which would result in the project attracting a large number of commute trips from outside the project site
- Recent housing data indicates low vacancy rates in the City of Davis, resulting in a significant percentage of ARC employees that would reside outside of Davis under Existing Plus Project conditions. Given the long trip distances and the lack of intercity/commuter transit services, these external commute trips would not be candidates for walk, bike, or transit trips.
- Lack of uses complementary to residential land uses (e.g., grocery retailer)

Note that in the MRIC EIR, the trip generation and internalization estimates for the Mixed-Use Alternative were adjusted based upon the presumption that on average, one MRIC employee would reside within each MRIC dwelling unit. Conversely, this study does not establish any explicit association between ARC dwelling units and ARC employees, and instead relies upon empirical data in the MXD+ model (i.e., trip

[2] US Census American Community Survey (ACS) journey to work data from 2017 indicates that approximately nine percent of existing workers living near the project site (i.e., Mace Ranch and South Davis) commute to work via bicycling or walking, compared to a City-wide average of approximately 26 percent. Moreover, Target and Nugget Market, the nearest existing major shopping destinations, are located 0.65 miles and 0.81 miles from project residential uses, respectively. Additionally, access to Nugget Market would require a bicyclist or pedestrian to traverse the Mace Boulevard interchange at I-80.

generation data collected at other mixed-use project sites) to estimate the degree to which on-site residential and commercial uses at the ARC would internalize travel.

Table 3: Aggie Research Campus Project – Vehicle Trip Generation

Land Use	Units	ITE Code	Quantity	Daily	AM In	AM Out	AM Total	PM In	PM Out	PM Total
ARC Project Component										
Net New Uses										
Office/R&D	1,000 Sq. Ft. GLA	710[1]	1,610	16,383	1,392	226	1,618	274	1,436	1,710
Manufacturing	1,000 Sq. Ft. GLA	140[2]	884	3,474	422	126	548	184	408	592
Hotel	Rooms	310[3]	150	1,267	41	29	70	44	42	86
Single Family Residential	Dwelling Units	220[4]	280	2,076	29	98	127	96	55	148
Multifamily Residential	Dwelling Units	221[5]	570	3,103	49	142	191	148	94	242
Raw External Project Trips				*26,303*	*1,933*	*621*	*2,554*	*743*	*2,035*	*2,778*
Reductions										
Internal Capture				-2,032	-204	-66	-270	-68	-188	-256
External Walk and Bike				-183	-17	-5	-22	-5	-13	-18
External Transit				-200	-20	-10	-30	-10	-15	-25
Total Reductions				*-2,415*	*-241*	*-81*	*-322*	*-83*	*-216*	*-299*
Net New External Project Trips				**23,888**	**1,692**	**540**	**2,232**	**660**	**1,819**	**2,479**
Mace Triangle Project Component										
Office/R&D	1,000 Sq. Ft. GLA	710[1]	81	762	80	13	93	13	69	82
Project Total (ARC + Mace Triangle)										
Net New External Project Trips				**24,650**	**1,772**	**553**	**2,325**	**673**	**1,888**	**2,561**

Notes:

[1] ITE Trip Generation land use category (710) – General Office Building (Adj Streets, 7-9A, 4-6P). Includes 100,000 sq. ft. of proposed ancillary retail space for ARC and 25,000 sq. ft. of proposed ancillary retail space for the Mace Triangle, as permitted by ITE for this land use category.

- Daily: Ln(T) = 0.97 * ln(X) + 2.50
- AM Peak Hour: T = 0.94(X) + 26.49 (88% in, 12% out)
- PM Peak Hour: Ln(T) = 0.95 * ln(X) + 0.36 (17% in, 83% out)

[2] ITE Trip Generation land use category (140) - Manufacturing (Adj Streets, 7-9A, 4-6P)

- Daily: T = 3.93(X)

- AM Peak Hour: T = 0.62(X) (73% in, 27% out)
- PM Peak Hour: T = 0.67(X) (44% in, 56% out)

[3] ITE Trip Generation land use category (310) - Hotel (Adj Streets, 7-9A, 4-6P)

- Daily: T = 11.29(X) + -426.97
- AM Peak Hour: T = 0.50(X) + -5.34 (59% in, 41% out)
- PM Peak Hour: T = 0.75(X) + -26.02 (51% in, 49% out)

[4] ITE Trip Generation land use category (220) - Multifamily Housing Low Rise (Adj Streets, 7-9A, 4-6P). This land use category was selected for use for the proposed 290 dwelling units of single-family housing. ITE indicates that this land use category is appropriate for use for attached housing between one and three stories in height, which is aligned with the proposed single-family housing product as described in the project description. Alternative options identified by ITE include detached single-family housing and mid-rise multi-family housing, neither of which align with the proposed single-family housing product as described in the project description.

- Daily: T = 7.56(X) + -40.86
- AM Peak Hour: Ln(T) = 0.95 * ln(X) + -0.51 (20% in, 80% out)
- PM Peak Hour: Ln(T) = 0.89 * ln(X) + -0.02 (65% in, 35% out

[5] ITE Trip Generation land use category (221) - Multifamily Housing Mid-Rise (Adj Streets, 7-9A, 4-6P)

- Daily: T = 5.45(X) + -1.75
- AM Peak Hour: Ln(T) = 0.98 * ln(X) + -0.98 (21% in, 79% out)
- PM Peak Hour: Ln(T) = 0.96 * ln(X) + -0.63 (65% in, 35% out)

Sources: Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition*, 2017; Fehr & Peers, 2020.

Vehicle Miles Traveled (VMT)

In this study, vehicle miles traveled (VMT) estimates were prepared for the purposes of identifying potential transportation impacts, as well as to inform other EIR sections including air quality, noise, energy, and greenhouse gas emissions. Project-generated VMT estimates were derived from the process previously described in the Analysis Methodology section.

The proposed ARC project is estimated to generate 309,000 VMT under existing conditions and 253,000 VMT under cumulative conditions on a typical weekday. The Mace Triangle project component is estimated to generate 10,800 VMT under existing conditions and 8,500 VMT under cumulative conditions on a typical weekday.

Changes to project-generated VMT estimates between Existing Plus Project and Cumulative Plus Project can be primarily attributed to changes in travel distances made by project residents and employees. They occur because of different local and regional land use patterns that would alter travel behavior within and between the City of Davis and neighboring jurisdictions (e.g., planned residential development within the City of Davis and on the UC Davis campus would enable a greater number of project employees to live locally, thereby reducing their work commute trip distance).

6. Significance Criteria

This section describes the thresholds or criteria that determine whether the project would cause an adverse effect to the roadway system (via its VMT contribution) as well as to the bicycle, pedestrian, and transit systems. These thresholds are based on policies from the *City of Davis General Plan*, policies from owner/operators of affected transportation facilities (e.g., Caltrans), criteria utilized in previous transportation studies prepared by the City, and professional judgment.

Roadway System VMT Criteria

The project is considered to result in a significant impact to the roadway system (via its VMT contribution) if the project-generated VMT per service population exceeds any of the following thresholds relative to existing local or regional VMT per service population averages:

- VMT Threshold #1: Project-generated VMT per service population would be less than or equal to local or regional VMT per service population averages, as analyzed for recent City of Davis CEQA documents;
- VMT Threshold #2: Project-generated VMT per service population would be less than or equal to 15 percent lower than the local or regional VMT per service population averages, as recommended by OPR in the Technical Advisory on Evaluating Transportation Impacts in CEQA; and
- VMT Threshold #3: Project-generated VMT per service population would be less than or equal to 14.3 percent lower than the local or regional VMT per service population averages, the threshold needing to be met in order to be consistent with the 2017 Scoping Plan Update and to achieve State climate goals as defined by the California Air Resources Board (CARB) in the Technical Advisory on Evaluating Transportation Impacts in CEQA.

Bicycle Facility Criteria

The project is considered to result in a significant impact to bicycle facilities if:

- The project conflicts with existing, planned, or possible future bicycle facilities; or
- The project otherwise decreases the performance or safety of such facilities.

Pedestrian Facility Criteria

The project is considered to result in a significant impact to pedestrian facilities if:

- The project conflicts with existing, planned, or possible future pedestrian facilities; or
- The project otherwise decreases the performance or safety of such facilities.

Transit Service and Facilities Criteria

The project is considered to result in a significant impact to transit facilities and services if:

- The project conflicts with existing, planned, or possible future transit facilities and services; or
- The project otherwise decreases the performance or safety of such facilities and services.

Other Transportation Considerations

The project is considered to result in a significant impact if any of the following conditions occur:

- The project does not provide for adequate emergency vehicle access and on-site circulation; or
- Construction-related traffic causes adverse effects as defined by the transportation system criteria described above.

7. Impacts and Mitigation Measures

This section describes the evaluation of potential transportation impacts associated with the construction of the project and, in instances where the project would cause a significant impact, identifies potential mitigation measures that would lessen the severity of the impact.

For the purposes of the SEIR, each impact described in this section concludes with a comparison to the relevant impact findings for the proposed MRIC project as described in Sections 4.14 (Transportation and Circulation) and Section 5 (Cumulative Impacts) of the MRIC EIR. Within the MRIC EIR, Impact Statements 4.14-1, 4.14-2, 4.14-3, 4.14-4, 5-21, 5-22, 5-23, and 5-24 all pertain to vehicle delay and LOS. Therefore, these are no longer considered environmental impacts under CEQA, and are not addressed further in this study. Refer to Volume 2 for a discussion of the project's anticipated effects on roadway operations and recommendations to ameliorate such effects for General Plan consistency purposes.

Project Impacts and Mitigation Measures

Impact 1: Impacts to vehicle miles traveled (VMT) on the roadway system.

Implementation of the proposed project would change local and regional VMT per service population in a manner that would exceed relevant local and State thresholds. This impact would therefore be **significant**.

The potential impact to VMT was evaluated by comparing the estimated VMT per service population (defined as project residents plus employees) that would be generated by the project to the local and regional VMT per service population averages. For the purposes of this study, the ARC Project is considered to result in a significant impact if the project-generated VMT per service population exceeds any of the following thresholds relative to the existing local or regional VMT per service population averages:

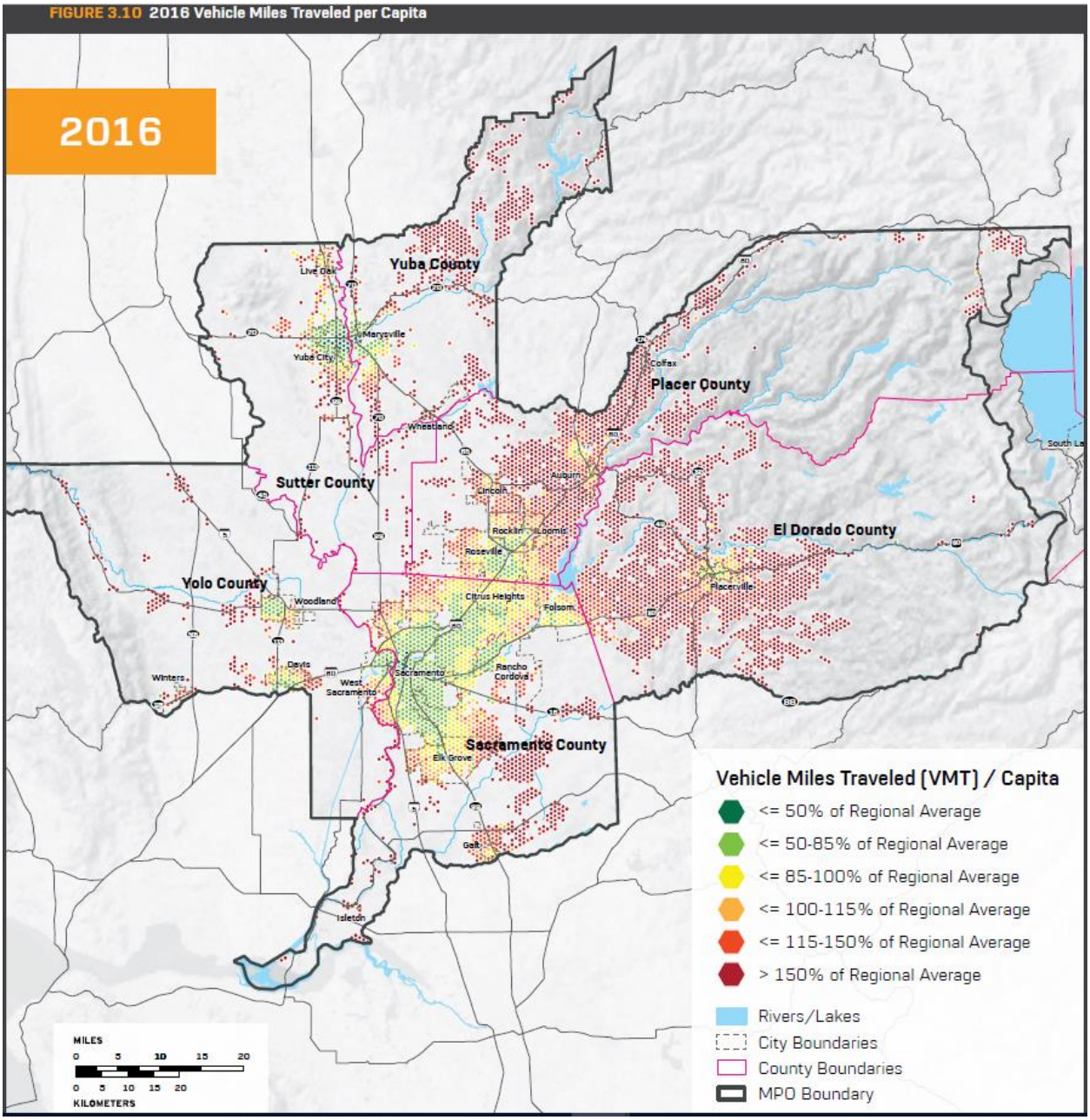
- VMT Threshold #1: Project-generated VMT per service population would be less than or equal to the existing local or regional VMT per service population averages , as analyzed for recent City of Davis CEQA documents;
- VMT Threshold #2: Project-generated VMT per service population would be less than or equal to 15 percent lower than the local or regional VMT per service population averages, as

recommended by OPR in the Technical Advisory on Evaluating Transportation Impacts in CEQA; and

- VMT Threshold #3: Project-generated VMT per service population would be less than or equal to 14.3 percent lower than the local or regional VMT per service population averages, the threshold needing to be met in order to be consistent with the 2017 Scoping Plan Update and to achieve State climate goals as defined by the California Air Resources Board (CARB) in the Technical Advisory on Evaluating Transportation Impacts in CEQA.

Table 4 presents the results of the VMT analysis. The proposed ARC Project and future buildout of the Mace Triangle are estimated to generate 309,000 VMT and 10,800 VMT, respectively, under Existing Plus Project conditions on a typical weekday. The project would generate an estimated 39.20 VMT per service population (i.e., residents plus employees) under Existing Plus Project conditions. The total VMT that would be generated by the ARC is equal to nine percent of the total VMT generated by the City of Davis under existing conditions.

The 2020 SACOG MTP/SCS analyzed existing (2016) and future (2040) VMT per capita for geographic areas throughout the SACOG region. The image on the following page illustrates the VMT per capita of the ARC Site vicinity relative to the regional VMT per capita average in 2016. According to the SACOG analysis, the ARC Site is located within a high VMT generating area, where VMT per capita levels measure between 115 and 150 percent of the regional average.



Analyses were performed using US Census OnTheMap database for 2017 conditions, which is the most recent year of available data. The analysis determined that there is a sizeable number of persons residing in the Sacramento metropolitan area that commute long distances to work destinations west of Davis, including many in the Bay Area. If the employment component of the ARC Project could induce some of these employers to relocate their operations or operate satellite work centers at the project site, many of

these trips could be 'intercepted', resulting in considerably shortened trip distances. This would reduce the project-generated VMT and VMT per service population below the estimates presented in this analysis.

Data currently does not exist to enable quantification of the expected number of 'regional commute' employees that would shift their work destination to the ARC Project. Thus, the VMT estimates presented herein are accurate, if not somewhat conservative, so as to ensure impacts are not understated. Potential information that would provide supporting evidence on this topic would include, but is not limited to, surveys of prospective ARC employers, employees, and residents and a detailed economic analysis of existing and anticipated future local and regional housing and employment trends (specifically those related to the City of Davis and UC Davis).

As shown in the Table 4, using this methodology, project-generated VMT per service population would measure below the average VMT per service population generated by the City of Davis and by the City of Davis with UC Davis but above the average VMT per service population generated by the SACOG region. Therefore, the ARC Project would exceed thresholds #1 (excluding local VMT), #2, and #3 listed above, and a **significant** impact would occur.

Table 4: Weekday VMT per Service Population – Existing Plus Project Conditions

Metric	Project Site[1]	City of Davis[2]	City of Davis & UC Davis[3]	SACOG Region[4]
Total VMT	319,800	3,411,358	4,268,554	123,034,634
Residents	2,119	71,755	80,794	2,374,910
Employees	6,040	13,987	26,365	940,683
Service Population	8,159	85,742	106,159	3,315,593
Total VMT per Service Population	39.20	39.79	40.21	37.11
VMT Significance Criteria Comparison				
% Difference between ARC project-generated VMT per service population and existing local/regional VMT per service population		-1.48%	-2.51%	+5.63%
Exceed VMT Threshold #1 (+0%)?		No	No	Yes
Exceed VMT Threshold #2 (-15%)?		Yes	Yes	Yes
Exceed VMT Threshold #3 (-14.3%)?		Yes	Yes	Yes

Notes: [1] Includes both the ARC and the Mace Triangle. ARC and Mace Triangle employee estimates derived from *City of Davis Economic Evaluation of Innovation Park Proposals* (BAE, July 2015) as follows: 5,882 ARC employees + 158 Mace Triangle employees = 6,040 total project employees. ARC resident estimates derived from American Community Survey unit occupancy estimates for the City of Davis as follows: (570 multi-family units x 2.44 occupants per unit) + (280 single-family units x 2.6 occupants per unit) = 2,119 total project residents.
[2] Resident and employee totals derived from the UC Davis/City of Davis Travel Demand Model land use inputs. Includes UC Davis residential uses located off-campus in the City of Davis (e.g., 8th and Wake Apartments).
[3] Resident and employee totals derived from the UC Davis/City of Davis Travel Demand Model land use inputs. Includes both City of Davis residents and employees and UC Davis on-campus residents and employees.
[4] Resident and employee totals derived from the UC Davis/City of Davis Travel Demand Model and SACSIM travel demand model land use inputs.
City of Davis, City of Davis with UC Davis, and SACOG region VMT per service population represent existing conditions.
Source: Fehr & Peers, 2020.

Mitigation Measure 1.1. Develop a TDM program and implement TDM strategies to reduce project-generated VMT.

Prior to issuance of the first building permit in the first phase of development, the applicant shall develop a TDM program for the entire proposed project, including any anticipated phasing, and shall submit the TDM program to the City Department of Public Works for review and approval. To the extent feasible, the TDM program should be designed to accomplish the following goals:

1) Reduce project-generated VMT such that the project achieves all three VMT-related significance thresholds; and

2) Achieve an average vehicle ridership (AVR) of 1.5 for peak period commute trips in accordance with Davis Municipal Code Section 22.15.060.

The Master Owners' Association (MOA) shall be responsible for implementing the TDM program:

1) The MOA shall be responsible for funding and overseeing the delivery of trip reduction/TDM proposed programs and strategies to achieve the project-generated VMT and AVR targets, which may include, but are not limited to, the following:
    a. Establishment of carpool, buspool, or vanpool programs;
    b. Vanpool purchase incentives;
    c. Cash allowances, passes, or other public transit subsidies and purchase incentives;
    d. Low emission vehicle purchase incentives/subsidies;
    e. Parking management strategies including limiting parking supply, charging parking fees, unbundling parking costs, and providing parking cash-out programs;
    f. Full or partial parking subsidies for ridesharing vehicles;
    g. Preferential parking locations for ridesharing vehicles;
    h. Computerized commuter rideshare matching service;
    i. Guaranteed ride-home program for ridesharing;
    j. Alternative workweek and flex-time schedules;
    k. Telecommuting or work-at-home programs;
    l. On-site lunch rooms/cafeterias;
    m. On-site commercial services such as banks, restaurants, groceries, and small retail;
    n. On-site day care facilities;
    o. Bicycle programs including bike purchase incentives, storage, maintenance programs, and on-site education program;
    p. Car share and bike share services;
    q. Enhancements to Unitrans, Yolobus, or other regional bus service;
    r. Enhancements to Capitol Corridor or other regional rail service;
    s. Enhancements to the citywide bicycle network;
    t. Dedicated employee housing located either on-site or elsewhere in the City of Davis;
    u. Designation of an on-site transportation coordinator for the project;
    v. Implement a fair value commuting program where fees charged to SOV commuters (e.g., through parking pricing) are tied to project vehicle trip reduction targets and

fee revenue is rebated to non-SOV commuters, or other pricing of vehicle travel and parking;

w. Support management strategies (e.g., pricing, vehicle occupancy requirements) on roadways or roadway lanes, particularly I-80 over the causeway;

x. Contribute to a VMT mitigation bank or exchange to support VMT reductions elsewhere in the City or region;

y. Change the project to increase project trip internalization (e.g., decrease employment uses and/or increase residential uses).

2) Single-phase development projects shall achieve project-generated VMT and AVR targets within five (5) years of issuance of any certificate of occupancy. Multi-phased projects shall achieve the project-generated VMT and AVR targets for each phase within three (3) years of the issuance of any certificate of occupancy.

3) In conjunction with final map approval, recorded codes, covenants and restrictions (CC&Rs) shall include provisions to guarantee adherence to the TDM objectives and perpetual operation of the TDM program regardless of property ownership, inform all subsequent property owners of the requirements imposed herein, and identify potential consequences of nonperformance.

   Each space use agreement (i.e., lease document) shall also include TDM provisions for the site as a means to inform and commit tenants to, and participate in, helping specific applicable developments meet TDM performance requirements.

4) Mace Triangle businesses shall implement a TDM program, which could be fulfilled by participation within the ARC TDM program.

5) Ongoing reporting:

   1) Annual TDM Report. The MOA for the Project shall submit an annual status report on the TDM program to the City Department of Public Works beginning a year after the issuance of any certificate of occupancy. Data shall be collected in October of each year and the Annual Report submitted by December 31 of each year. The report shall be prepared in the form and format designated by the City, which must either approve or disapprove the program.

      i. The TDM performance reports shall focus on the trip reduction incentives offered by the project, their effectiveness, the estimated greenhouse gas (GHG) emissions generated by the project, and the methods by which a continued trajectory towards carbon neutrality in 2050 can be achieved consistent with Mitigation Measure 1.1. The report shall:

- Report the project-generated VMT levels attained;
- Report the AVR levels attained;
- Verify the TDM plan incentives that have been offered;
- Describe the use of those incentives offered by employers;
- Evaluate why the plan did or did not work to achieve the project-generated VMT and AVR targets and explain why the revised plan is more likely to achieve the project-generated VMT and AVR target levels;
- List additional incentives which can be reasonably expected to correct deficiencies;
- Evaluate the feasibility and effectiveness of trip reduction/TDM program and strategies, as implemented;
- Estimate the greenhouse gas emissions generated by project transportation operations; and
- Identify off-setting GHG credits to be secured by the project to achieve carbon neutrality.

ii. The MOA shall develop and implement an annual monitoring program to determine if project-generated VMT and AVR targets are being met. The monitoring program could include employee travel surveys, traffic counts at project site ingress/egress points, and other relevant information.

iii. If the project-generated VMT and/or AVR targets are not met for any two consecutive years, the applicant or current owner of the site will contribute funding to be determined in a separate study toward the provision of additional or more intensive travel demand management programs, such as enhanced regional transit service to the site, employee shuttles, and other potential measures.

iv. In the event that other TDM objectives are not met as documented in the Annual Monitoring Report submitted by December 31 of each year, the MOA shall:

- Submit to the City within thirty (30) days of submittal of the annual report, a list of TDM measures that will be implemented to meet the TDM objectives within one hundred eighty (180) days of submittal of annual report. At the end of the one-hundred-eighty-day period, the MOA shall submit a revised performance report to determine

compliance with TDM objectives. No further measures will be necessary if the TDM objectives are met.

Should the TDM objectives not be satisfied by the end of the one-hundred-eighty-day period, the MOA shall pay a TDM penalty fee to the City in an amount determined by resolution of the City Council. Said penalty fee may be used to provide new transit service and/or subsidize existing transit service, construct bicycle facilities, and/or improve street capacity through construction of physical improvements to be selected by the City of Davis from the list of area-wide improvements identified in the City's CIP.

Significance after Mitigation

Implementation of Mitigation Measure 1.1 would reduce project-generated VMT per service population by instituting a TDM program to reduce external vehicle trips generated by the project. However, the effectiveness of the TDM strategies is not known and subsequent vehicle trip reduction effects cannot be guaranteed. Existing evidence indicates that the effectiveness of TDM strategies with regards to vehicle trip reduction can vary based on a variety of factors, including the context of the surrounding built environment (e.g., urban versus suburban) and the aggregate effect of multiple TDM strategies deployed together. Moreover, many TDM strategies are not just site specific, but also rely on implementation and/or adoption by private entities (e.g., elective use of carpool program by office building tenants).

As noted above, due to uncertainties regarding the ability for the aforementioned mitigation measure to reduce VMT impacts to less-than-significant levels, VMT impacts would be considered **significant and unavoidable**.

Comparison to MRIC EIR

This represents a new unmitigable significant impact when compared to the MRIC EIR, which found impacts to VMT to be less-than-significant with mitigation (see Impact 4.14-6 from the MRIC EIR). This can be explained by the following changes from the MRIC EIR:

- Changes to the project description
- Changes to the VMT significance criteria
- Changes to baseline local and regional land uses
- Changes to VMT analysis methods (e.g., use of new travel demand models)
- Changes to current understanding of efficacy of TDM strategies

Impact 2: Impacts to bicycle and pedestrian facilities.

Implementation of the proposed project would increase bicycle, pedestrian, and vehicle trips within the vicinity of the project site, which could increase the competition for physical space between modes and

increase the potential for conflicts involving bicyclists and pedestrians. This impact would therefore be **significant**.

Existing facilities adjacent to the project include Class II bike lanes on Mace Boulevard and Alhambra Drive, and a shared-use path on Alhambra Drive. Existing intersections near the project site are typical of suburban roadway systems in that they were designed and constructed to prioritize the movement of vehicles over other modes of travel. Defining features of these intersections include channelized right-turn lanes, multiple travel lanes for each approach, long crossing distances for bicyclists and pedestrians, and uncontrolled mixing areas between bicyclists, pedestrians, and high-speed vehicular traffic. Altogether, these intersection characteristics can diminish the safety and comfort of bicycle and pedestrian facilities and discourage walking and biking as a mode of travel.

The project would provide a bike path within the 50-foot transition zone of the on-site agricultural buffer, which would connect to the existing Class II bike lane on County Road 32A at the project's southeastern corner. The project would provide bicycle support facilities such as bicycle racks, storage lockers, a repair station, and showers.

The project would construct a grade-separated bicycle and pedestrian crossing of Mace Boulevard north of Alhambra Drive. Additionally, the project would construct a Class I shared-use path on the west side of Mace Boulevard from the proposed grade-separated bicycle and pedestrian crossing to Harper Junior High School. This path improvement along the inside of the Mace Curve would close an existing gap in the off-street path network in the project vicinity. In addition to facilitating bicycle and pedestrian travel to/from the project site, this gap closure project would accommodate students walking and biking to/from Harper Junior High School along Mace Boulevard with a bicycle and pedestrian facility separated from vehicular traffic. The Offices @ Mace Ranch project located at the northwest corner of the Mace Boulevard/Alhambra Drive intersection will also provide a path connection to the proposed grade-separated crossing along its Mace Boulevard and Alhambra Drive frontages. This project is currently under construction and scheduled for completion in 2020.

Project-generated bicycle and pedestrian trips would primarily utilize the following facilities for travel to and from the project site:

- Proposed grade-separated bicycle and pedestrian crossing of Mace Boulevard and path connection to Harper Junior High School
- Existing Class I shared-use path on the south side of Covell Boulevard to/from Wildhorse, Oak Tree Plaza, and North Davis
- Existing Class I shared-use paths throughout Mace Ranch and Class II bike lanes on Alhambra Drive to/from Mace Ranch, East Davis, Central Davis, Downtown Davis, and UC Davis

- Existing Class II bike lanes on Second Street to/from Target Shopping Center, Second Street employment centers, Downtown Davis, and UC Davis
- Existing Class II bike lanes on Mace Boulevard to/from the El Macero Shopping Center and South Davis
- Existing Class II bike lanes on County Road 32A to/from Sacramento
- Existing sidewalks, paths, bike lanes, marked crosswalks, and/or crossings at the following intersections:
    - Mace Boulevard/Alhambra Drive
    - Mace Boulevard/Second Street/County Road 32A
    - Mace Boulevard/I-80 WB Ramps
    - Mace Boulevard/I-80 EB Ramps
    - Mace Boulevard/Chiles Road

The substantial amount of project-generated vehicle trips (as described in Volume 2) would largely utilize the same roadway facilities for travel to and from the project site. Therefore, due to increases in bicycle, pedestrian, and vehicle trips generated by the project within the vicinity of the project site, transportation facilities that require mixing of vehicles, bicyclists, and pedestrians would experience increases in the competition for physical space between the modes and, in turn, an increase in the potential for conflicts involving bicyclists and pedestrians. These conditions could diminish the safety and performance of bicycle and pedestrian facilities, particularly at locations where bicyclists and pedestrians experience long crossing distances, long exposure times, uncontrolled conflicts with high-speed vehicular traffic, or blockages due to queued vehicles. The project's contributions to these conditions would be substantial at the following locations:

- Mace Boulevard/Alhambra Drive
    - Existing southbound channelized right-turn lane due to project increases to bicycle and pedestrian crossings (bicycle-vehicle and pedestrian-vehicle conflicts)
    - Existing eastbound channelized right-turn lane due to project increases to diverted traffic from eastbound Covell Boulevard to Alhambra Drive and increases in bicycle and pedestrian crossings. Moreover, the inability for eastbound vehicles to turn right onto Mace Boulevard (due to worsened traffic congestion on southbound Mace Boulevard caused by the project) could cause queue spillbacks that block the crosswalk (bicycle-vehicle and pedestrian-vehicle conflicts)
    - Proposed northbound and westbound channelized right-turn lanes due to project increases to vehicle traffic and bicycle and pedestrian crossings. Moreover, the inability for westbound vehicles to turn right onto Mace Boulevard (due to worsened traffic congestion on northbound Mace Boulevard caused by the project) could cause queue

spillbacks that block the crosswalk in the westbound channelized right-turn lane (bicycle-vehicle and pedestrian-vehicle conflicts)

- Mace Boulevard/Second Street/County Road 32A
    - Existing southbound channelized right-turn lane due to project increases to vehicle traffic and bicycle and pedestrian crossings (bicycle-vehicle and pedestrian-vehicle conflicts)
    - Existing eastbound channelized right-turn lane due to project increases to bicycle and pedestrian crossings. Moreover, the inability for eastbound vehicles to turn right onto Mace Boulevard (due to worsened traffic congestion on southbound Mace Boulevard caused by the project) could cause queue spillbacks that block the crosswalk (bicycle-vehicle and pedestrian-vehicle conflicts)
- Mace Boulevard/I-80 WB Ramps
    - Existing westbound channelized right-turn lane due to project increases to vehicle traffic and bicycle and pedestrian crossings. Moreover, the inability for westbound vehicles to turn right onto Mace Boulevard (due to worsened traffic congestion on northbound Mace Boulevard caused by the project) could cause queue spillbacks that block the crosswalk (bicycle-vehicle and pedestrian-vehicle conflicts)
    - Existing southbound approach bike lane and upstream unmarked bicycle-vehicle mixing zone due project increases to vehicle queue spillbacks into mixing zone (bicycle-vehicle conflict)
- Mace Boulevard/I-80 EB Ramps
    - Existing southbound slip ramp due to lengthy unmarked bicycle-vehicle mixing zones and project increases to vehicle traffic and bicycle crossings (bicycle-vehicle conflict)
    - Existing northbound slip ramp due to lengthy unmarked bicycle-vehicle mixing zones, unmarked pedestrian crosswalks, and project increases to vehicle traffic and bicycle and pedestrian crossings (bicycle-vehicle and pedestrian-vehicle conflicts)
- Mace Boulevard/Chiles Road
    - Existing southbound channelized right-turn lane due to project increases to vehicle traffic and bicycle crossings (bicycle-vehicle conflict)
    - Existing eastbound channelized right-turn lane due to project increases to bicycle and pedestrian crossings (bicycle-vehicle and pedestrian-vehicle conflicts)
    - Existing northbound channelized right-turn lane due to project increases to vehicle traffic and bicycle and pedestrian crossings (bicycle-vehicle and pedestrian-vehicle conflicts)
- County Road 32A
    - The increase in vehicle trips on County Road 32A could adversely affect bicycle flow along County Road 32A between County Road 105 and the access to the causeway bicycle path. The combination of the existing lane width (11 feet in each direction), high travel speeds,

and soft shoulders plus the addition of project vehicle trips could disrupt bicycle flows on County Road 32A. Bicycle flows could also be disrupted for westbound bicycle traffic on County Road 32A that continues onto the path west of County Road 105. These cyclists must cross vehicle traffic on County Road 32A just southeast of the at-grade rail crossing where County Road 32A has a sharp curve. Similarly, eastbound bicyclists accessing the causeway shared-use path must cross oncoming vehicle traffic on County Road 32A just east of the I-80 off-ramp where County Road 32A has a curve. The addition of project peak hour vehicle trips to County Road 32A has the potential to negatively affect bicyclists making these uncontrolled movements.

Note that except for the proposed westbound and northbound channelized right-turn lanes at the Mace Boulevard/Alhambra Drive intersection, all of the locations described above are existing features of the transportation system. Therefore, while the project would exacerbate the detrimental effects of these features, portions or all of these facilities may be considered existing deficiencies with respect to the bicycle and pedestrian environment.

As described previously, the project would be built-out in four phases over a twenty to twenty-five year time period. Since this analysis examines the hypothetical scenario where the project at buildout would be added to the existing transportation setting, it cannot reasonably identify the associated bicycle and pedestrian impacts of each phase of development based on the timing of the development phase and the surrounding transportation circumstances at that time.

The project would neither construct nor interfere with the implementation of planned bicycle facilities identified in the *City of Davis General Plan* or the *Beyond Platinum Bicycle Action Plan*. Proposed bicycle enhancements in the *City of Davis Beyond Platinum Bicycle Action Plan* include buffered bike lanes along Second Street between Mace Boulevard and L Street, as well as bike lane conflict markings and bike intersection crossing markings on Mace Boulevard at the I-80 interchange ramps. Several of the roadways near the project site, including Mace Boulevard, Covell Boulevard, Second Street, and Chiles Road are designated as Greenstreets in the *City of Davis General Plan*. Action TRANS 2.1(k) calls for the City to review standards for these roadways to reflect other bicycle and pedestrian friendly policies in the Circulation Element, including the elimination of intersection standards that allow high speed right turns for motor vehicles.

The project also would not interfere with planned regional bicycle projects identified in the SACOG MTP/SCS.

Altogether, these factors would constitute a significant impact to bicycle facilities.

Mitigation Measure 2.1. Construct proposed off-site bicycle and pedestrian facilities.

Prior to issuance of the first certificate of occupancy of the ARC, the applicant shall construct the following proposed off-site bicycle and pedestrian facilities as described in the project description and shown on the project site plan:

1) Grade-separated bicycle and pedestrian crossing of Mace Boulevard north of Alhambra Drive
2) Class I shared-use path on the west side of Mace Boulevard between proposed grade-separated crossing and Harper Junior High School
3) Pedestrian and landscaping improvements on the access road between the Mace park-and-ride and County Road 32A

Implementation of these improvements would improve bicycle and pedestrian facilities on Mace Boulevard by reducing the potential for bicycle-vehicle and pedestrian-vehicle conflicts.

Mitigation Measure 2.2. Improve bicycle facilities on County Road 32A.

Prior to issuance of the first certificate of occupancy of the ARC, the applicant shall contribute fair share funding to cover their proportionate cost of the following improvements:

- Widen County Road 32A between County Road 105 and the Causeway Bicycle Path Access to meet Yolo County standards for a two-lane arterial (14-foot travel lanes and 6-foot shoulder/on-street bike lanes).
- Westbound bicycle crossing improvements at the existing at-grade railroad crossing at County Road 32A and County Road 105. Potential improvements include a marked bicycle crossing for westbound bicyclists with advanced warning devices for vehicle traffic. These improvements would facilitate westbound bicyclists continuing west onto the shared-use path located between the Union Pacific Railroad mainline and I-80 (e.g., to the west of County Road 105). As noted earlier, Yolo County, together with Union Pacific and the City of Davis, are currently evaluating potential modifications to this at-grade crossing to reduce the potential for conflicts with rail operations. Therefore, the ultimate improvements constructed at this crossing should be consistent with the preferred modifications identified in this County-led study.
- Eastbound bicycle crossing improvements for bicyclists turning left from County Road 32A onto the causeway shared-use path. Potential improvements include the installation of a

marked crossing on the east leg of the County Road 32A/I-80 WB off-ramp intersection and construction of a two-way path on the north side of County Road 32A between the County Road 32A/I-80 WB off-ramp intersection and the entrance to the causeway path.

- Widen County Road 32A between County Road 105 and the causeway shared-use path access point to meet Yolo County standards for a two-lane arterial (14-foot travel lanes and 6-foot shoulder/on-street bike lanes).

Implementation of these improvements, or a set of improvements of equal effectiveness, would improve bicycle facilities on County Road 32A by reducing the potential for bicycle-vehicle conflicts.

Mitigation Measure 2.3. Identify and construct complete streets improvements on the Mace Boulevard corridor.

The applicant shall identify and construct complete streets improvements on the Mace Boulevard corridor, including the following actions:

1) Prior to issuance of the first building permit for the ARC, the applicant shall fund and complete (in conjunction with City staff) a corridor plan for the Mace Boulevard corridor between Harper Junior High School and Cowell Boulevard.[3] At a minimum, the corridor plan shall identify complete streets improvements that achieve the following goals:
    1) Provide safe and comfortable access for pedestrian and bicyclists
    2) Minimize the potential for bicycle-vehicle and pedestrian-vehicle conflicts
    3) Provide fast and efficient transit operations
    4) Minimize cut-through traffic on residential roadways
    5) Avoid operating conditions that degrade roadway safety (e.g., off-ramp queue spillback to freeway mainline)

    The corridor plan shall be prepared to the satisfaction of the City of Davis Public Works Department and be approved by the City of Davis City Council. The corridor plan should also include a thorough public engagement process to understand the transportation priorities of

[3] Policy TRANS 2.8 of the *City of Davis General Plan* calls for the preparation of corridor plans for selected corridors throughout the City. The segment of Mace Boulevard referenced in Mitigation Measure 2.3-3 includes all of corridor #15 (Mace Boulevard – Harper Junior High School to Interstate 80) and portions of corridors #2 (Chiles Road – Drummond Avenue to East City Limit) and #16 (Mace Boulevard – Interstate 80 to South City Limit) as shown in Map 5 of the *General Plan* Circulation Element. Corridors #2 and #15 do not currently have corridor plans. Corridor #16 south of Cowell Boulevard was recently modified based on prior corridor planning efforts. The segment of Corridor #16 between Cowell Boulevard and Interstate 80 was excluded from those efforts and does not currently have a corridor plan.

the surrounding community. This should include an initial hearing before the Planning Commission and the Bicycling, Transportation, and Street Safety Commission (BTSSC) to solicit initial input and a second hearing for review of the draft plan.

2) In conjunction with submittal of a final planned development or tentative map, whichever occurs first, for each ARC project phase, the MOA for the project shall submit a focused transportation impact study for the phase under review. The study shall document current conditions at the time and identify the anticipated transportation system effects associated with the development proposed for the phase under review and the necessary transportation system improvements to ameliorate these effects in accordance with the methods and significance thresholds used in this transportation impact analysis. Improvements should be consistent with the complete streets goals and improvements identified in the Mace Boulevard corridor plan to be funded and completed by the applicant as described above. The study should also address the degree to which improvements would address any significant impacts caused by the project at buildout as identified in this transportation impact analysis. Potential improvements include, but are not limited to, the following:

    1) Improvements to on- and off-street bicycle facilities on Mace Boulevard and connecting roadways, including Covell Boulevard, Alhambra Drive, Second Street, County Road 32A, and Chiles Road

    2) Improvements to bicycle and pedestrian crossings at the following intersections:

        a. Mace Boulevard/Alhambra Drive
        b. Mace Boulevard/Second Street/County Road 32A
        c. Mace Boulevard/I-80 WB Ramps
        d. Mace Boulevard/I-80 EB Ramps
        e. Mace Boulevard/Chiles Road

    Crossing improvements should reduce the potential for bicycle-vehicle and pedestrian-vehicle conflicts and provide for safe and comfortable access for pedestrians and bicyclists. Potential crossing improvements include, but are not limited to bike lane conflict markings, intersection crossing markings, reductions to crossing distances, and physically separating bicyclists from vehicles (e.g., conversion to a protected intersection). Additionally, crossing improvements should include the modification of existing channelized right-turn lanes to either a) remove and replace the lanes with standard right-turn lanes, or b) retrofit the lanes to reduce vehicles speeds and increase yield compliance rates.

3) Roadway capacity and operations improvements, as described in the Recommendations section of Volume 2. In particular, roadway capacity and operations improvements should address any adverse project effects to transit travel times and on-time performance, as well as operating conditions that degrade roadway safety (e.g., off-ramp queue spillback to freeway mainline).

Improvements identified in the focused transportation impact study should achieve the following performance measures:

1) Reduce the number and/or severity of bicycle-vehicle and pedestrian-vehicle conflict points at intersections and intersection approaches.
2) Eliminate otherwise anticipated increases in transit travel times and/or adverse changes to transit on-time performance that would be caused by the project in accordance with standards established by Unitrans, Yolobus, and other potential future transit operators.
3) Eliminate otherwise anticipated adverse effects to emergency vehicle response times that would be caused by the project in accordance with standards established by the City of Davis Fire Chief.
4) Eliminate otherwise anticipated increases in cut-through traffic on residential roadways that would be caused by the project.
5) Eliminate otherwise anticipated vehicle queuing that would be caused by the project that would adversely affect roadway safety, including off-ramp queue spillbacks to the freeway mainline, queue spillbacks that block bicycle and/or pedestrian facilities, and queue spillbacks that exceed available turn pocket storage and block adjacent through travel lanes.

The focused transportation impact study should also identify the funding and implementing responsibilities for each improvement, including whether the improvement should be constructed by the applicant or if the applicant should contribute fair share funding to cover their proportionate cost for the improvements. The applicant shall construct the improvement and/or contribute fair share funding prior to the issuance of the first certificate of occupancy for each project phase under review.

Secondary Impacts After Mitigation

Elements of Mitigation Measure 2.3, particularly the potential for roadway operations and capacity improvements along the Mace Boulevard corridor, have the potential to exacerbate impacts to VMT described in Impact 1. Existing evidence indicates that Covell Boulevard, Mace Boulevard, and connecting roadways such as Second Street and Chiles Road are utilized as regional cut-through routes when I-80 experiences significant speed reductions and delays during p.m. peak periods (see Volume 2). Therefore, improving operations and reducing delays along these local roadways could increase the attractiveness of these routes as alternatives to I-80 and induce additional regional cut-through activity on local roadways. Parallel local routes require longer trip distances than remaining on I-80, therefore, regional travel demand use of local routes would yield more VMT than use of I-80.

Significance after Mitigation

Implementation of Mitigation Measures 2.1, 2.2, and 2.3 would reduce potential significant impacts associated with bicycle facilities to a less-than-significant level by supporting bicycling to and from the project site and reducing conflicts between bicycles and other travel modes.

However, elements of each mitigation measure would occur within Caltrans, Yolo County, and/or UPRR rights-of-way and would be subject to final approval and actions by others. Moreover, since the remaining fair share contributions needed for the construction of those mitigation measure elements requiring the project's fair share contribution have not been identified by the relevant lead agency, fair share payment by the project applicant would not ensure construction. Finally, the ultimate improvements resulting from Mitigation Measure 2.3 are subject to change pending the outcome of the Mace Boulevard Corridor Plan process described in Mitigation Measure 2.3. Therefore, the implementation and effectiveness of these mitigation measures cannot be guaranteed. As noted above, due to uncertainties regarding the ability for the aforementioned mitigation measures to reduce impacts to bicycle and pedestrian facilities, bicycle and pedestrian facility impacts would be considered **significant and unavoidable**.

Comparison to MRIC EIR

This represents a new unmitigable significant impact when compared to the MRIC EIR, which found impacts to bicycle and pedestrian facilities to be less-than-significant with mitigation (see Impact 4.14-9 from the MRIC EIR). This can be explained by the following changes from the MRIC EIR:

- Changes to the project description
- Changes to the bicycle and pedestrian significance criteria, particularly a new focus on safety and performance of bicycle and pedestrian facilities
- Changes to the feasibility of mitigation measures, particularly those requiring approval and actions by other entities

Impact 3: Impacts to transit service and facilities.

Implementation of the proposed project would increase the number of passengers utilizing transit service and facilities. New transit passenger demand would be accommodated by existing transit services. However, increases to transit travel times caused by the project would adversely affect the on-time performance and service quality of existing transit services. This impact would therefore be **significant**.

The ARC would introduce new office, manufacturing, and retail land uses that are situated in close proximity to the current transit stops (near Mace Boulevard/Second Street) for the A, O, P, Q, and Z bus routes operated by Unitrans. These routes serve a variety of retail, employment, medical, institutional, and recreational destinations throughout the City, and operate with 30-minute headways, and long service hours. The *City of Davis Short Range Transit Plan* indicates that 91 to 95 percent of all riders are UC Davis undergraduate students, three to six percent of riders are UC Davis graduate students, and just over 5 percent of riders are not UC Davis affiliates.

The *Unitrans General Manager's Report for Fiscal Year 2018-19* indicates that Unitrans experiences high levels of crowding (i.e., more than 60 passengers on standard bus or more than 100 passengers on a double-decker bus) on 3.5 percent of all bus trips.

Table 5 summarizes route-level ridership, productivity (passengers per revenue hour), and on-time performance for Unitrans routes serving the project site. Unitrans policy is to increase daily headways from 30 minutes to 15 minutes on routes with more than 60 passengers per hour. The five routes that serve the project site have ridership levels that are well under the 60 passenger per hour threshold and the project would not result in an increase above that threshold. While the project is expected to increase transit ridership on Unitrans, given the expected number of project transit riders and existing transit patronage, the project would not cause a demand above that which is provided or planned.

Table 5: Unitrans Route Performance Summary – Project Site Vicinity

Route	Annual Ridership	Passengers per Revenue Hour	On-Time Performance
A – Silo/Amtrak/5th/Alhambra	231,493	41.1	85%
O – MU/Amtrak/5th/Alhambra/Target	30,541	37.8	Not Reported
P – MU/Davis Perimeter Counter Clockwise	252,649	30.9	80%
Q – MU/Davis Perimeter Clockwise	259,039	32.6	68%
Z – MU/Amtrak/Cantrill/5th	105,990	26.2	90%

Source: *Unitrans General Manager's Report for Fiscal Year 2018-19.*

On-time performance is defined by Unitrans as a as a bus arriving at the terminal before the scheduled time or within five minutes of the scheduled time. Arriving more than five minutes late is defined as "late". Unitrans has a systemwide on-time performance target of 90 percent. Systemwide, Unitrans on-time performance was 88 percent during the 2018-19 fiscal year, and thus failed to meet their on-time performance target. This constitutes a five percent drop in systemwide on-time performance from four years prior. Unitrans indicates that they may consider significant route changes on the A, P, Q, and Z lines in FY 2020 to help reduce travel time and improve on-time performance in East Davis. As described in Volume 2, the project would cause substantial increases to vehicle travel demand and peak hour delay on roadways within the project site vicinity. Affected roadways include Mace Boulevard, Alhambra Drive, and Second Street, all of which are utilized by Unitrans routes serving the study area. Since Unitrans service would experience increases to peak hour delays at a level commensurate with general vehicle traffic, the project would cause adverse effects to Unitrans travel times and on-time performance. Reductions to route-level and systemwide on-time performance caused by the project would require Unitrans to restructure service or increase operating costs in order to maintain acceptable on-time performance thresholds.

Yolobus currently operates both intercity and express bus service in the City of Davis. Routes 42A and 42B are intercity routes that provide hourly service between downtown Sacramento, West Sacramento, Davis, Woodland, and the Sacramento International Airport. The routes have a scheduled bus stop at the intersection of Mace Boulevard and Second Street. The express bus routes operated by Yolobus in Davis are currently programmed to serve inbound commute trips to Sacramento in the morning peak period and return trips to Davis in the evening commute peak period. Since the project is an employment center expected to serve trips in the reverse direction, project employees are not expected to use the existing express bus routes. While the project is expected to result in a small increase in transit ridership on Yolobus, given the expected number of project transit riders and existing transit patronage, the ARC would not cause demand to exceed provided or planned Yolobus capacity. Similar to Unitrans routes serving the study area, Yolobus routes serving the study area would be subject to delay increases due to project-generated vehicle traffic and peak hour delay increases.

The ARC proposes the construction of Transit Plaza within the site that would be accessed via the new project access located on the east leg of the existing Mace Boulevard/Alhambra Drive intersection. This would require that Unitrans and Yolobus buses divert from Mace Boulevard into the project site to serve the transit plaza. This would result in additional travel time that would impact scheduling for the individual routes.

Because the ARC Project would adversely affect transit operations, particularly along the Mace Boulevard corridor, a **significant** impact to transit service and operations would occur as a result of the ARC Project.

Mitigation Measure 3.1. Construct enhanced bus stops on Mace Boulevard near Alhambra Drive.

Prior to the issuance of the first certificate of occupancy of the first ARC project phase, the project applicant shall fund and construct new bus stops with turnouts on both sides of Mace Boulevard at the new primary project access point at Alhambra Drive. The project applicant shall prepare design plans, to be reviewed and approved by the City of Davis Public Works Department, and construct bus stops with shelters, paved pedestrian waiting areas, lighting, real time transit information signage, and pedestrian connections between the new bus stops and all buildings on the project site. Responsibility for implementation of this mitigation measure shall be assigned to the ARC and Mace Triangle on a fair share basis. Upon completion of the ARC transit center, in consultation with Unitrans and Yolobus, the bus stops shall be moved to the ARC transit center at the expense of the ARC.

Mitigation Measure 3.2. Identify and construct complete streets improvements on the Mace Boulevard corridor.

Implement Mitigation Measure 2.3 (Identify and construct complete streets improvements on the Mace Boulevard corridor).

Significance after Mitigation

Implementation of Mitigation Measures 3.1 and 3.2 would reduce potential significant impacts associated with transit service and facilities by supporting transit use to and from the project site and minimizing adverse effects to transit operations that would be caused by the project.

However, elements of Mitigation Measure 3.2 would occur within Caltrans rights-of-way and would be subject to final approval and actions by others. Moreover, since the remaining fair share contributions needed for the construction of mitigation measure elements requiring the project's fair share contribution have not been identified by the relevant lead agency, fair share payment by the project applicant would not ensure construction. Finally, the ultimate improvements resulting from Mitigation Measure 3.2 are subject to change pending the outcome of the Mace Boulevard Corridor Plan process described in Mitigation Measure 3.2. Therefore, the implementation of these mitigation measures and their effectiveness cannot be guaranteed.

As noted above, due to uncertainties regarding the ability for the aforementioned mitigation measures to reduce impacts to transit service and facilities, transit service and facility impacts would be considered **significant and unavoidable**.

Comparison to MRIC EIR

This represents a new unmitigable significant impact when compared to the MRIC EIR, which found impacts to transit service and facilities to be less-than-significant with mitigation (see Impact 4.14-10 from the MRIC EIR). This can be explained by the following changes from the MRIC EIR:

- Changes to the project description
- Changes to the feasibility of mitigation measures, particularly those requiring approval and actions by other entities (e.g., Caltrans)

Impact 4: Impacts to emergency vehicle access.

Implementation of the proposed project would not impede emergency vehicle access. This impact would therefore be **less than significant**.

The proposed project would include three vehicular access points on Mace Boulevard (two full access, and one right-in/right-out only) and two vehicular access points on County Road 32A (both full access). Altogether, these connections would provide multiple opportunities and routes for emergency vehicles to access the site from multiple directions.

Fire access from the South Davis fire station (located one-half mile south of the project site on Mace Boulevard) would be available via northbound Mace Boulevard. Fire access from the Downtown Davis fire station (located nearly three miles west of the project site) would be available via eastbound Fifth Street and Alhambra Drive. Medical emergency service access to/from Sutter Davis Hospital (located over four miles west of the project site) would be available via Covell Boulevard. Each of these corridors have traffic signals equipped with emergency vehicle pre-emption, providing signal priority to emergency vehicles in the event of an emergency.

The design of the on-site roadways and intersections will be subject to City of Davis code and Public Works Department staff review and approval.

Therefore, this impact is considered **less-than-significant**.

Mitigation Measures

None required.

Impact 5: Construction-related impacts.

Implementation of the proposed project would result in construction activities that would disrupt the surrounding multi-modal transportation system. This impact would therefore be **significant**.

Construction of the project, including site preparation and construction, and delivery activities, would generate employee trips and a variety of construction-related vehicles. Construction activities would include disruptions to the transportation network near the project site, including the possibility of temporary lane closures, street closures, sidewalk closures, and bikeway closures. Bicycle and transit access may also be disrupted.

The most concentrated period of heavy truck traffic is anticipated to occur when excavated soil from the off-site storage pond is transported over to the ARC project site. It is forecast that a total of approximately 10,833 trucks will access the site over 30 work days, resulting in an average of approximately 720 truck trips per day (i.e., 360 truck loads per day, with two trips – one loaded trip to the site, one return empty trip – for each load). Trucks are projected to travel to and from the east end of the Howatt Ranch property near the levee adjacent to the Yolo Bypass. Trucks would access the southern portion of the site via County Road 32A, with trucks traveling to the Howatt Ranch site via County Road 32A and County Road 105. Use of County Road 32A by construction trucks could cause a short-term adverse impact to bicyclists using existing bike lanes.

These activities could also result in degraded roadway conditions. Altogether, these factors would result in a significant impact related to project construction.

Mitigation Measure 5.1. Prepare a Construction Traffic Control Plan.

Prior to any construction activities for the project site, the project applicant shall prepare a detailed Construction Traffic Control Plan and submit it for review and approval by the City Department of Public Works. The applicant and the City shall consult with Yolo County, Caltrans, Unitrans, Yolobus, and local emergency service providers for their input prior to approving the Plan. The plan shall ensure that acceptable operating conditions on local roadways and freeway facilities are maintained during construction. At a minimum, the plan shall include:

- The number of truck trips, time, and day of street closures
- Time of day of arrival and departure of trucks
- Limitations on the size and type of trucks, provision of a staging area with a limitation on the number of trucks that can be waiting

- Provision of a truck circulation pattern that minimizes effects on existing vehicle traffic during peak travel periods and maintains safe bicycle circulation
- Minimize use of County Road 32A by construction traffic during peak travel periods
- Resurface and/or repair any damage to roadways that occurs as a result of construction traffic
- Provision of driveway access plan so that safe vehicular, pedestrian, and bicycle movements are maintained (e.g., steel plates, minimum distances of open trenches, and private vehicle pick up and drop off areas)
- Maintain safe and efficient access routes for emergency vehicles
- Manual traffic control when necessary
- Proper advance warning and posted signage concerning street closures
- Provisions for pedestrian safety

A copy of the construction traffic control plan shall be submitted to local emergency response agencies and these agencies shall be notified at least 14 days before the commencement of construction that would partially or fully obstruct roadways.

Significance after Mitigation

Implementation of Mitigation Measure 5.1 would reduce potential significant impacts associated with project construction activity to a **less-than-significant** level by minimizing the effects of project construction to the surrounding multi-modal transportation system.

Cumulative Impacts and Mitigation Measures

Cumulative transportation impacts consider those that would result from the construction of the proposed project combined with other future land use and transportation system changes anticipated to occur by 2036. The project's contribution to cumulative impacts may be considerable if it worsens or results in a significant cumulative impact. Under cumulative conditions, the project would cause an impact if both of the following criteria are met:

- An unacceptable condition would exist; and
- The project would have a cumulatively considerable contribution to the unacceptable condition.

The proposed project is anticipated to be constructed in four phases over a 20 to 25-year period. Under cumulative conditions, the proposed project site plan and off-site transportation system modifications would not differ from those described in the project-specific impact analysis provided above.

The cumulative transportation impact analysis considered reasonably foreseeable land use and transportation system changes expected to occur by the 2036 analysis year, including the completion of

the proposed Aggie Research Campus project. These changes include, but are not limited to, the following planned, approved, or under construction land use and transportation projects relevant to the proposed project:

- Land Use Projects
    - UC Davis 2018 Long Range Development Plan (LRDP) – The LRDP anticipates the addition of 5,175 students, 2,135 employees, and 10,958 residents (9,050 students, 485 employees, and 1,423 dependents) on the UC Davis campus between 2016 and 2030. Individual components of the LRDP include the following:
        - West Village Expansion – located west of SR-113 and south of Russell Boulevard, will include an additional 3,300 student beds and 485 employee residents. The student housing portion of the project has been approved by the UC Regents and is currently under construction.
        - Orchard Park Redevelopment – located east of SR-113 and south of Russell Boulevard, will include an additional 200 student family housing units and up to 1,200 student beds.
        - Emerson Hall Replacement (Shasta Hall) – located on Oxford Circle west of Sycamore Lane and north of Russell Boulevard, will include the demolition of an existing 500-bed dormitory and the construction of a new dormitory with capacity for up to 800 student beds.
    - Other mid- to large-sized planned or approved development projects within the City of Davis located over one mile from the project site, including University Commons, the West Davis Active Adult Community, the Nishi Residential Project, Lincoln40, Sterling 5th Street Apartments, Davis Live Plaza 2555, and the 3820 Chiles Road Apartments.
    - Including the City of Davis development projects listed above, residential and employment growth equal to 2036 control totals projected for the City of Davis by SACOG in the adopted 2016 Metropolitan Community Plan/Sustainable Communities Strategy.
    - Residential and employment growth elsewhere in the SACOG region (e.g., Sacramento, West Sacramento, Woodland, etc.) equal to 2036 forecasts projected by SACOG in the adopted 2016 Metropolitan Transportation Plan/Sustainable Communities Strategy.
- Transportation System Projects
    - I-80 HOV lanes from Richards Boulevard to Sacramento.
    - I-80/Richards Boulevard interchange improvements.
    - Anderson Road four-to-two lane reduction between West Covell Boulevard and Villanova Drive.
    - Fifth Street four-to-two lane reduction between L Street and Pole Line Road.

Impact 6: Cumulative impacts to vehicle miles traveled (VMT) on the roadway system.

Under cumulative conditions, implementation of the proposed project would change local and regional VMT per service population in a manner that would exceed relevant local and State thresholds. This impact would therefore be **significant**.

Impact 1 provides an evaluation of potential project impacts to VMT under Existing Plus Project conditions. Under Existing Plus Project conditions, the project would cause a significant impact to VMT by virtue of resulting in project-generated VMT per service population measuring above the applicable significance thresholds relative to existing local and regional VMT per service population averages. The VMT impact analysis for Existing Plus Project conditions applies to Cumulative Plus Project conditions for the following reasons:

- The VMT significance threshold compares project-generated VMT per service population to that of existing local and regional development. This comparison is useful because it provides information regarding how the project aligns with long-term environmental goals related to VMT established based on existing development levels. Use of VMT significance thresholds based on existing development levels is recommended in the OPR Technical Advisory on Evaluating Transportation Impacts in CEQA.
- The OPR Technical Advisory on Evaluating Transportation Impacts in CEQA indicates that VMT efficiency metrics, such as VMT per service population, are not appropriate for CEQA cumulative analysis. Instead, the Technical Advisory recommends that an impact finding from an efficiency-based project-specific VMT analysis (i.e., Existing Plus Project conditions) would imply an identical impact finding for a cumulative VMT analysis. An example provided by OPR explains that a project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact.

Based on the above, the ARC Project's cumulative VMT impact would be considered **significant**.

Mitigation Measure 6.1. Develop a TDM program and implement TDM strategies to reduce project-generated VMT.

Implement Mitigation Measure 1.1 (Develop a TDM program and implement TDM strategies to reduce project-generated VMT).

Significance after Mitigation

Implementation of Mitigation Measure 6.1 would reduce project-generated VMT per service population by instituting a TDM program to reduce external vehicle trips generated by the project. However, the effectiveness of the TDM strategies is not known and subsequent vehicle trip reduction effects cannot be guaranteed. Existing evidence indicates that the effectiveness of TDM strategies with regards to vehicle trip reduction can vary based on a variety of factors, including the context of the surrounding built environment (e.g., urban versus suburban) and the aggregate effect of multiple TDM strategies deployed together. Moreover, many TDM strategies are not just site specific, but also rely on implementation and/or adoption by private entities (e.g., elective use of carpool program by office building tenants).

As noted above, due to uncertainties regarding the ability for the aforementioned mitigation measure to reduce cumulative VMT impacts to less-than-significant levels, cumulative VMT impacts would be considered **significant and unavoidable**.

Comparison to MRIC EIR

This represents a new unmitigable significant impact when compared to the MRIC EIR, which did not analyze potential cumulative VMT impacts.

Impact 7: Cumulative impacts to bicycle and pedestrian facilities.

Together with increases vehicle traffic caused by reasonably foreseeable land use growth, implementation of the proposed project would increase bicycle, pedestrian, and vehicle trips within the vicinity of the project site, which could increase the competition for physical space between modes and increase the potential for conflicts involving bicyclists and pedestrians. This impact would therefore be **significant**.

No reasonably foreseeable new bicycle or pedestrian facilities would be constructed within the vicinity of the project site under cumulative conditions. Under cumulative conditions, given the limited amount of reasonably foreseeable land use development near the project site, only modest increases in background bicycle and pedestrian activity would occur within the vicinity of the project site. More substantial increases in background vehicle traffic would occur on study area roadways due to growth elsewhere in and around Davis. However, growth in background vehicle traffic would not materially change the adverse effects to bicycle and pedestrian that would be attributable to the project. Therefore, the project-specific

bicycle and pedestrian impact analysis provided in Impact 2 would similarly apply to cumulative plus project conditions.

This would constitute a significant impact to bicycle and pedestrian facilities under cumulative conditions.

Mitigation Measure 7.1. Construct proposed off-site bicycle and pedestrian facilities.

Implement Mitigation Measure 2.1 (Construct proposed off-site bicycle and pedestrian facilities).

Mitigation Measure 7.2. Improve bicycle facilities on County Road 32A.

Implement Mitigation Measure 2.2 (Improve bicycle facilities on County Road 32A).

Mitigation Measure 7.3. Identify and construct complete streets improvements on the Mace Boulevard corridor.

Mitigation Measure 2.3 (Identify and construct complete streets improvements on the Mace Boulevard corridor).

Secondary Impacts After Mitigation

Elements of Mitigation Measure 7.3, particularly the potential for roadway operations and capacity improvements along the Mace Boulevard corridor, have the potential to exacerbate impacts to VMT described in Impact 6. Existing evidence indicates that Covell Boulevard, Mace Boulevard, and connecting roadways such as Second Street and Chiles Road are utilized as regional cut-through routes when I-80 experiences significant speed reductions and delays during p.m. peak periods (see Volume 2). Therefore, improving operations and reducing delays along these local roadways could increase the attractiveness of these routes as alternatives to I-80 and induce additional regional cut-through activity on local roadways. Parallel local routes require longer trip distances than remaining on I-80, therefore, regional travel demand use of local routes would yield more VMT than use of I-80.

Significance after Mitigation

Implementation of Mitigation Measures 7.1, 7.2, and 7.3 would reduce potential significant impacts associated with bicycle facilities to a less-than-significant level by supporting bicycling to and from the project site and minimizing conflicts between bicycles and other travel modes.

However, elements of each mitigation measure would occur within Caltrans, Yolo County, and/or UPRR rights-of-way and would be subject to final approval and actions by others. Moreover, since the remaining

fair share contributions needed for the construction of mitigation measure elements requiring the project's fair share contribution have not been identified by the relevant lead agency, fair share payment by the project applicant would not ensure construction. Finally, the ultimate improvements resulting from Mitigation Measure 7.3 are subject to change pending the outcome of the Mace Boulevard Corridor Plan process described in Mitigation Measure 2.3. Therefore, the implementation of these mitigation measures cannot be guaranteed.

As noted above, due to uncertainties regarding the ability for the aforementioned mitigation measures to reduce impacts to bicycle and pedestrian facilities, cumulative impacts to bicycle and pedestrian facilities would be considered **significant and unavoidable**.

Comparison to MRIC EIR

This represents a new unmitigable significant impact when compared to the MRIC EIR, which found cumulative impacts to bicycle and pedestrian facilities to be less-than-significant with mitigation (see Impact 4.14-9 from the MRIC EIR). This can be explained by the following changes from the MRIC EIR:

- Changes to the project description
- Changes to the bicycle and pedestrian significance criteria, particularly a new focus on safety and performance of bicycle and pedestrian facilities
- Changes to the feasibility of mitigation measures, particularly those requiring approval and actions by other entities (e.g., Caltrans)

Impact 8: Cumulative impacts to transit service and facilities.

Implementation of the proposed project would increase the number of passengers utilizing transit service and facilities. New transit passenger demand would be accommodated by transit services anticipated to be in service under cumulative conditions. However, increases to transit travel times caused by the project as well as reasonably foreseeable land use growth would adversely affect the on-time performance and service quality of transit services under cumulative conditions. This impact would therefore be **significant**.

The only anticipated change to transit service in the study area under cumulative conditions is the implementation of the Causeway Connection bus service between UC Davis and the UC Davis Health Campus in Sacramento. This service will serve the Mace park-and-ride once per hour in the eastbound direction during the morning peak period and once per hour in the westbound direction during the evening peak period. Given this schedule, use of the Causeway Connection service by the project would be nominal since project employee will primarily generate commute transit demand in the opposite direction.

Under cumulative conditions, substantial increases in background vehicle traffic would occur on study area roadways due to growth elsewhere in and around Davis. Together with the substantial increase in vehicle traffic caused by the project, this would cause adverse effects to transit operations by increasing transit service delay and running times. However, growth in background vehicle traffic would not materially change the adverse effects to transit services that would be attributable to the project. Therefore, the project-specific transit service and facility impact analysis provided in Impact 3 would similarly apply to cumulative plus project conditions.

This would constitute a significant impact to transit service and facilities under cumulative conditions.

Mitigation Measure 8.1. Construct enhanced bus stops on Mace Boulevard near Alhambra Drive.

Implement Mitigation Measure 3.1 (Construct enhanced bus stops on Mace Boulevard near Alhambra Drive).

Mitigation Measure 8.2. Identify and construct complete streets improvements on the Mace Boulevard corridor.

Implement Mitigation Measure 2.3 (Identify and construct complete streets improvements on the Mace Boulevard corridor).

Secondary Impacts After Mitigation

Elements of Mitigation Measure 8.2, particularly the potential for roadway operations and capacity improvements along the Mace Boulevard corridor, have the potential to exacerbate impacts to VMT described in Impact 6. Existing evidence indicates that Covell Boulevard, Mace Boulevard, and connecting roadways such as Second Street and Chiles Road are utilized as regional cut-through routes when I-80 experiences significant speed reductions and delays during p.m. peak periods (see Volume 2). Therefore, improving operations and reducing delays along these local roadways could increase the attractiveness of these routes as alternatives to I-80 and induce additional regional cut-through activity on local roadways. Parallel local routes require longer trip distances than remaining on I-80, therefore, regional travel demand use of local routes would yield more VMT than use of I-80.

Significance after Mitigation

Implementation of Mitigation Measures 8.1 and 8.2 would reduce potential significant impacts associated with transit service and facilities to a less-than-significant level by supporting transit use to and from the project site and minimizing adverse effects to transit operations that would be caused by the project.

However, elements of Mitigation Measure 8.2 would occur within Caltrans rights-of-way and would be subject to final approval and actions by others. Moreover, since the remaining fair share contributions needed for the construction of mitigation measure elements requiring the project's fair share contribution have not been identified by the relevant lead agency, fair share payment by the project applicant would not ensure construction. Finally, the ultimate improvements resulting from Mitigation Measure 8.2 are subject to change pending the outcome of the Mace Boulevard Corridor Plan process described in Mitigation Measure 3.2. Therefore, the implementation of these mitigation measures cannot be guaranteed.

As noted above, due to uncertainties regarding the ability for the aforementioned mitigation measures to reduce impacts to transit service and facilities, cumulative impacts to transit service and facility would be considered **significant and unavoidable**.

Comparison to MRIC EIR

This represents a new unmitigable significant impact when compared to the MRIC EIR, which did not address potential cumulative impacts to transit service and facilities.

Impact 9: Cumulative impacts to emergency vehicle access.

Implementation of the proposed project would not impede emergency vehicle access. This impact would therefore be **less than significant**.

The proposed project would include three vehicular access points on Mace Boulevard (two full access, and one right-in/right-out only) and two vehicular access points on County Road 32A (both full access). Altogether, these connections would provide multiple opportunities and routes for emergency vehicles to access the site from multiple directions.

Fire access from the South Davis fire station (located one-half mile south of the project site on Mace Boulevard) would be available via northbound Mace Boulevard. Fire access from the Downtown Davis fire station (located nearly three miles west of the project site) would be available via eastbound Fifth Street and Alhambra Drive. Medical emergency service access to/from Sutter Davis Hospital (located over four miles west of the project site) would be available via Covell Boulevard. Each of these corridors have traffic signals equipped with emergency vehicle pre-emption, providing signal priority to emergency vehicle in the event of an emergency.

The design of the on-site roadways and intersections will be subject to City of Davis code and Public Works Department staff review and approval.

Therefore, this is considered a **less-than-significant** impact.

Mitigation Measures

None required.

Impact 10: Cumulative construction-related impacts.

Implementation of the proposed project would result in construction activities that would disrupt the surrounding multi-modal transportation system. This impact would therefore be **significant**.

Construction of the project, including site preparation and construction, and delivery activities, would generate employee trips and a variety of construction-related vehicles. Construction activities would include disruptions to the transportation network near the project site, including the possibility of temporary lane closures, street closures, sidewalk closures, and bikeway closures. Bicycle and transit access may also be disrupted. The project is planned for construction in four phases over a twenty to twenty-five year timeframe. Thus, the construction activities related to the project could occur during the cumulative analysis year.

The most concentrated period of heavy truck traffic is anticipated to occur during the period that the existing detention basin on the site is being filled. It is forecast that a total of approximately 10,833 trucks will access the site over 30 work days, resulting in an average of approximately 720 truck trips per day (i.e., 360 truck loads per day, with two trips – one loaded trip to the site, one return empty trip – for each load). Trucks are projected to travel to and from the east end of the Howatt Ranch property near the levee adjacent to the Yolo Bypass. Trucks would access the southern portion of the site via County Road 32A, with trucks traveling to the Howatt Ranch site via County Road 32A and County Road 105. Use of County Road 32A by construction trucks could cause a short-term adverse impact to bicyclists using existing bike lanes.

These activities could also result in degraded roadway conditions. Altogether, these factors would result in a significant impact related to project construction.

Mitigation Measure 10.1. Prepare a Construction Traffic Control Plan.

Implement Mitigation Measure 5.1 (Prepare a Construction Traffic Control Plan).

Significance after Mitigation

Implementation of Mitigation Measure 10.1 would reduce potential cumulative impacts associated with project construction activity to a **less-than-significant** level by minimizing the effects of project construction to the surrounding multi-modal transportation system.

Aggie Research Campus

Technical Appendix

March 2020

RS19-3828.01

FEHR PEERS

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MEMORANDUM

Date: January 22, 2020

To: Nick Pappani, Raney Planning & Management

From: Greg Behrens, AICP, Fehr & Peers

Subject: ***Aggie Research Campus Project Trip Generation***

RS19-3828.01

This memorandum provides a brief description of the proposed Aggie Research Campus (ARC) project land uses and the estimated weekday daily and peak hour project trip generation. These estimates will be used in the development of the "Existing Plus Project" condition. The "Cumulative Plus Project" condition will also use many of these same estimates, but will additionally consider changed conditions within the vicinity of the project site (e.g., buildout of nearby planned and approved development projects) between the two scenarios.

Project Description

The proposed project would consist of a mix of land uses including office/R&D, advanced manufacturing, ancillary retail, residential, and hotel on 194 acres. The project site is situated immediately east of the City of Davis city limit, northeast of the Interstate 80 (I-80) interchange at Mace Boulevard.

Table 1 presents the buildout development program for the project as proposed by the project applicant.

Table 1
Aggie Research Campus Project – Proposed Land Use Program

Land Use	Units	Buildout Quantities
Office/R&D	KSF	1,510
Advanced Manufacturing	KSF	884
Hotel/Conference	Rooms/KSF	150/160
Ancillary Retail	KSF	100
Residential[1]	DU	850
Total Non-Residential Development (KSF)		2,654

Source: Aggie Research Campus Project Description, October 2019.
Note: [1]Per direction from City staff, residential would be comprised of one-third single-family dwelling units and two-thirds multi-family dwelling units.

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Methodology

MXD+

Prior to 2007, conventional methods available to transportation engineers systematically overestimated the trips generated by and impacts of mixed-use development because they did not accurately reflect the amount of internal trip linking or the level of external trips made by transit, biking, and/or walking. This resulted in increased development costs, due to oversized infrastructure, skewed public perception, and resistance to approving smart growth. While the Institute of Transportation Engineers (ITE) *Trip Generation Handbook* does include a methodology for estimating internal trips, it only applies to AM and PM peak hour conditions and has been shown to be less accurate than more academically-oriented efforts.

In the early 2000's, two significant research studies provided the opportunity to improve the state of practice. One study sponsored by the US EPA (MXD) and another by the Transportation Research Board (NCHRP 684) have developed means to improve trip generation estimation for mixed-use development (MXD). The two studies examined over 240 mixed-use development sites throughout the U.S. and, using different approaches, developed new quantification methods. Fehr & Peers has reviewed the two methods, including the basis, capabilities, and appropriate uses of each, to produce a new method (MXD+) that combines the strengths of the two individual tools to establish a new best practice. MXD+ recognizes that traffic generation by mixed-use and other forms of sustainable development relate closely to the density, diversity, design, destination accessibility, transit proximity, and scale of development.

The MXD+ method explains 97 percent of the variation in trip generation among mixed-use developments, compared to 65 percent for the methods previously recommended by ITE. While remaining slightly (2 to 4 percent) conservative to avoid systematically understating impacts, it substantially reduces the 35 to 37 percent average overestimate of traffic generation produced by conventional ITE methods.

MXD+ improves the accuracy of impact estimation and gives planners a tool to rationally balance land use mix and to incorporate urban design, context compatibility, and transit orientation to create lower impact development. Fehr & Peers has applied MXD+ on hundreds of EIRs throughout California over the past decade, including EIRs for several projects in the City of Davis such as The Cannery and the West Davis Active Adult Community.

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Project Trip Generation

Table 2 summarizes the estimated weekday and peak hour trip generation for the ARC project using the MXD+ tool. As shown in Table 2, the project would generate an estimated 23,888 net daily trips, 2,232 net AM peak hour trips, and 2,479 net PM peak hour trips during a typical weekday.

The following factors influence the estimated trip reductions resulting from internalization and shifts to transit, walk, and bike trips:

- Suburban location on the edge of the developed area
- Low-density surroundings
- Poor walk/bike access to off-site trip generators/activity centers, particularly due to long travel distances
- Poor intercity/commuter transit access
- High jobs/population ratio (approximately 2.78 jobs for every resident), which would result in the project attracting a large number of commute trips without producing a commensurate number of commute trips (i.e., these must be fulfilled by external trips)
- Lack of uses complementary to residential land uses (e.g., neighborhood commercial)

Table 2 Aggie Research Campus Project – Vehicle Trip Generation										
Land Use	**Units**	**ITE Code**	**Quantity**	**Daily**	**AM In**	**AM Out**	**AM Total**	**PM In**	**PM Out**	**PM Total**
Net New Uses										
General Office Building	1,000 Sq. Ft. GLA	710[1]	1,610	16,383	1,392	226	1,618	274	1,436	1,710
Manufacturing	1,000 Sq. Ft. GLA	140[2]	884	3,474	422	126	548	184	408	592
Hotel	Rooms	310[3]	150	1,267	41	29	70	44	42	86
Multifamily Housing Low Rise	Dwelling Units	220[4]	280	2,076	29	98	127	96	55	148
Multifamily Housing Mid Rise	Dwelling Units	221[5]	570	3,103	49	142	191	148	94	242
Raw External Project Trips				*26,303*	*1,933*	*621*	*2,554*	*743*	*2,035*	*2,778*
Reductions										
Internal Capture				-2,032	-204	-66	-270	-68	-188	-256
External Walk and Bike				-183	-17	-5	-22	-5	-13	-18
External Transit				-200	-20	-10	-30	-10	-15	-25
Total Reductions				*-2,415*	*-241*	*-81*	*-322*	*-83*	*-216*	*-299*
Net New External Project Trips				**23,888**	**1,692**	**540**	**2,232**	**660**	**1,819**	**2,479**

Sources: Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition*, 2017; Fehr & Peers, 2020.
Notes:
[1] ITE Trip Generation land use category (710) – General Office Building (Adj Streets, 7-9A, 4-6P). Includes 100,000 sq. ft. of proposed ancillary retail space, as permitted by ITE for this land use category.

- Daily: Ln(T) = 0.97 * ln(X) + 2.50
- AM Peak Hour: T = 0.94(X) + 26.49 (88% in, 12% out)
- PM Peak Hour: Ln(T) = 0.95 * ln(X) + 0.36 (17% in, 83% out)

[2] ITE Trip Generation land use category (140) - Manufacturing (Adj Streets, 7-9A, 4-6P)

- Daily: T = 3.93(X)
- AM Peak Hour: T = 0.62(X) (73% in, 27% out)
- PM Peak Hour: T = 0.67(X) (44% in, 56% out)

[3] ITE Trip Generation land use category (310) - Hotel (Adj Streets, 7-9A, 4-6P)

- Daily: T = 11.29(X) + -426.97
- AM Peak Hour: T = 0.50(X) + -5.34 (59% in, 41% out)
- PM Peak Hour: T = 0.75(X) + -26.02 (51% in, 49% out)

[4] ITE Trip Generation land use category (220) - Multifamily Housing Low Rise (Adj Streets, 7-9A, 4-6P). This land use category was selected for use for the proposed 290 dwelling units of single-family housing. ITE indicates that this land use category is appropriate for use for attached housing between one and three stories in height, which is aligned with the proposed single-family housing product as described in the project description. Alternative options identified by ITE include detached single-family housing and mid-rise multi-family housing, neither of which align with the proposed single-family housing product as described in the project description.

- Daily: T = 7.56(X) + -40.86
- AM Peak Hour: Ln(T) = 0.95 * ln(X) + -0.51 (20% in, 80% out)
- PM Peak Hour: Ln(T) = 0.89 * ln(X) + -0.02 (65% in, 35% out

[5] ITE Trip Generation land use category (221) - Multifamily Housing Mid-Rise (Adj Streets, 7-9A, 4-6P)

- Daily: T = 5.45(X) + -1.75
- AM Peak Hour: Ln(T) = 0.98 * ln(X) + -0.98 (21% in, 79% out)
- PM Peak Hour: Ln(T) = 0.96 * ln(X) + -0.63 (65% in, 35% out)

FEHR PEERS

MEMORANDUM

Date: March 6, 2020

To: Nick Pappani, Raney Planning & Management

From: Greg Behrens & John Gard, Fehr & Peers

Subject: ***Aggie Research Campus MXD+ Model Information***

RS19-3828.01

In light of discussions held on February 29, 2020 at City of Davis offices regarding the ARC's trip generation, we prepared this memorandum to document our technical approach and demonstrate using substantial evidence that it is defensible and accurate means for estimating the project's trips.

Table 8-26 of the Draft EIR indicates that the Proposed Project would generate 24,650 new daily vehicle trips, 2,325 new AM peak hour vehicle trips, and 2,561 new PM peak hour vehicle trips. Pages 8-207 through 8-209 describe the MXD+ methodology that was used to develop these estimates. In very simple terms, MXD+ works as follows:

- It begins with the latest ITE *Trip Generation Manual* trip rates, and then estimates internal trips and external walk, bike, and transit trips. Those estimates are then subtracted from the raw ITE trips to yield the external/new vehicle trips the project would generate

MXD+ has been in use by Fehr & Peers for many years including multiple applications in the City of Davis. Despite its widespread use and acceptance, we do occasionally encounter agencies and staff that remain skeptical.

In Fall 2019, Fehr & Peers used its own Research & Development funds to investigate whether MXD+ is still producing accurate estimates of external vehicle trip generation for mixed-use projects. To accomplish this, we performed vehicle trip generation data collection at 15 mixed-use sites across the United States, ranging in size from 4 to 4,000 acres. Four of these sites contained large amounts of office space. These sites, which are situated in California and Georgia, are shown in **Table 1**.

Table 2 shows how MXD+ performed for each of these four sites in terms of its accuracy of matching the actual measured vehicle trip generation at each of these sites. Key findings from this table include:

1. For all three time periods and four sites, MXD+ estimates were within 12 percent or less of the actual, measured count.

2. The average absolute error for the four sites was 8 percent under daily conditions, 7 percent under AM peak hour conditions, and 3 percent under PM peak hour conditions.

This is particularly important because traffic volumes may often fluctuate by 5 percent or more from day to day. Thus, the variation in MXD+ estimates are comparable to, and in some cases, even less than the variation in daily traffic.

Table 1
Fehr & Peers' Mixed-Use Research Sites with Heavy Employment Uses

Mixed-Use Location	Site Acreage	Amount of Office Space	Land Use Mix / Transit Availability
Sunnyvale, Ca	12 acres	564 KSF	Dense complementary land uses located adjacent to a light rail station
Sacramento, Ca	221 acres	1,084 KSF	Suburban setting with complementary land uses limited primarily to residential. Not well served by transit
Santa Clara, Ca	68 acres	1,707 KSF	Good diversity of land uses. 15-minute bus service provided.
Alpharetta, Ga	79 acres	582 KSF	Excellent diversity of land uses. Modest bus service provided.

Source: Fehr & Peers, 2020.

Table 2
External Vehicle Trip Generation Comparison for Fehr & Peers' Mixed-Use Research Sites with Heavy Employment Uses

Mixed-Use Location	External Vehicle Trips					
	Daily		AM Peak Hour		PM Peak Hour	
	MXD+ Estimate	Actual	MXD+ Estimate	Actual	MXD+ Estimate	Actual
Sunnyvale, Ca	8,975 (+3%)	8,707	604 (-13%)	693	702 (0%)	705
Sacramento, Ca	21,583 (+11%)	19,362	1,732 (-7%)	1,863	1,945 (-2%)	1,985
Santa Clara, Ca	26,624 (-12%)	30,330	1,924 (-2%)	1,959	2,335 (-9%)	2,549
Alpharetta, Ga	34,840 (+5%)	33,301	1,610 (-4%)	1,685	2,500 (-2%)	2,543

Note: Value shown in parentheses represent the percentage that the MXD+ estimate over or underpredicts the actual value.
Source: Fehr & Peers, 2020.

Despite the above conclusions, some may continue to be skeptical of MXD+ and wonder if other tools may be equally or more effective at estimating external vehicle trips generated by an employment-oriented mixed-use project. Such a tool does exist, and it is contained in ITE's *Trip Generation Handbook*[1]. **Table 3** compares how the "ITE Internalization Method" compares to MXD+ for the four research sites. This table demonstrates that ITE Internalization method results substantially higher (i.e., less accurate) average absolute error values than the MXD+ method.

Table 3
Comparison of Absolute Error in MXD+ and ITE Internalization Method Vehicle Trip Generation for Fehr & Peers' Mixed-Use Research Sites with Heavy Employment Uses

Mixed-Use Location	Absolute Error of Estimate					
	Daily		AM Peak Hour		PM Peak Hour	
	MXD+	ITE Internalization Method	MXD+	ITE Internalization Method	MXD+	ITE Internalization Method
Sunnyvale, Ca	3%	Method not provided for daily conditions	13%	1%	0%	25%
Sacramento, Ca	11%		7%	13%	2%	17%
Santa Clara, Ca	12%		2%	16%	9%	5%
Alpharetta, Ga	5%		4%	28%	2%	13%
Average	8%		7%	15%	3%	15%

Note: Value shown in parentheses represent the percentage that the MXD+ estimate over or underpredicts the actual value.
Source: Fehr & Peers, 2020.

In conclusion, we believe the MXD+ model is the best tool available to accurately estimate a mixed-use project's trip generation. This memorandum demonstrated its accuracy in matching observed trips from four employment-oriented mix-use projects of similar size to the proposed project.

[1] ITE's methodology is *NCHRP 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments* (2011). Page 3 of that report states that "researchers do not recommend use of this method for suburban activity centers or new town types of development: the researchers do not believe it will be applicable". MXD+ blends the predictive equations from NCHRP 684 and the Environmental Protection Agency (EPA) MXD model to better utilize the strengths and minimize the weaknesses of each approach.

Aggie Research Campus

Volume 2 – Traffic Operations Analysis

Prepared for:
Raney Planning & Management, Inc.

March 2020

RS19-3828.01

FEHR PEERS

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1. Introduction

This document presents an analysis of the potential effects of the proposed Aggie Research Campus project (the project) with respect to traffic operations (i.e., vehicle delay) on roadway facilities within the vicinity of the project site. This analysis is deliberately separate from the transportation impact study in Volume 1 in accordance with the CEQA Guidelines, which no longer permit the use of vehicle delay or level of service (LOS) for the purposes of identifying environmental impacts for land use projects. This analysis has been prepared for two primary reasons. First, it informs other components of the transportation impact analysis (e.g., potential impacts to transit services) and other topics addressed in the Aggie Research Campus SEIR (e.g., air quality, noise, GHG, etc.). Second, it directly addresses the proposed project's consistency with City of Davis General Plan policies related to traffic operations and level of service.

An accompanying document, the Aggie Research Campus Transportation Impact Study (Volume 1) describes existing transportation conditions and analyzes the potential for the proposed project to affect the surrounding transportation environment in accordance with current CEQA Guidelines. This includes potential impacts to vehicle miles traveled (VMT) and transit, bicycle, and pedestrian components of the transportation system that may result from the proposed project, as well as impacts during project construction. Where necessary and feasible, mitigation measures are identified to reduce these impacts.

Analysis Scenarios

The following scenarios are analyzed in this study:

- **Existing Conditions –** Establishes the existing setting, which is used to measure project-specific transportation effects.
- **Existing Plus Project Conditions –** Adds changes to travel demand resulting from buildout of the proposed project to existing conditions.
- **Cumulative No Project Conditions –** Represents cumulative travel demand based on reasonably foreseeable local and regional land use and transportation system changes. For the purposes of this study, the cumulative year is 2036. This scenario assumes the project site remains vacant.
- **Cumulative Plus Project Conditions –** Adds changes to travel demand resulting from buildout of the proposed project to Cumulative No Project conditions.

Evaluations are performed for each element of the transportation system for each of these scenarios.

2. Analysis Methodology

This section describes the methods utilized to analyze roadway traffic operations.

Analysis Locations

Figure 1 displays the locations of the study intersections and roadway segments, which were selected in consultation with City of Davis staff and based on the project's expected travel characteristics (i.e., project location and amount of project trips) as well as facilities susceptible to being affected by the project. This analysis includes the following study locations:

Study Intersections

1. East Covell Boulevard/Pole Line Road
2. East Covell Boulevard/Birch Lane
3. East Covell Boulevard/Baywood Lane
4. East Covell Boulevard/Manzanita Lane
5. East Covell Boulevard/Wright Boulevard
6. East Covell Boulevard/Monarch Lane
7. East Covell Boulevard/Alhambra Drive
8. East Covell Boulevard/Harper Junior High School
9. Mace Boulevard/Alhambra Drive/South ARC Driveway
10. Second Street/Fermi Place/Target Driveway
11. Mace Boulevard/Second Street/County Road 32A
12. County Road 32A/Mace Park-and-Ride Driveway/West ARC Driveway
13. Mace Boulevard/I-80 WB Ramps
14. Mace Boulevard/Chiles Road
15. Chiles Road/I-80 EB Ramp
16. Mace Boulevard/Cowell Boulevard
17. Mace Boulevard/El Macero Drive
18. County Road 32A/County Road 105
19. County Road 32A/I-80 WB Ramps
20. County Road 32B/Chiles Road/I-80 EB Ramps
21. Mace Boulevard/Central ARC Driveway
22. Mace Boulevard/County Road 30B/North ARC Driveway
23. County Road 32A/East ARC Driveway

Study Roadway Segments

1. East Covell Boulevard: west of Pole Line Road
2. East Covell Boulevard: east of Pole Line Road
3. Pole Line Road: north of East Covell Boulevard
4. Pole Line Road: south of East Covell Boulevard
5. East Covell Boulevard: west of Alhambra Drive
6. East Covell Boulevard: east of Harper Junior High School
7. Alhambra Drive: south of East Covell Boulevard
8. Alhambra Drive: west of Mace Boulevard
9. Second Street: west of the Fermi Place
10. County Road 32A: east of project site
11. Chiles Road: west of I-80 EB Off-Ramp
12. Chiles Road: east of Mace Boulevard
13. Cowell Boulevard: west of Mace Boulevard
14. Mace Boulevard: south of El Macero Drive

Note that the Certified Final EIR transportation study considered the transportation system effects of not just the MRIC project, but also the proposed Davis Innovation Center and Nishi Gateway projects, for which the combined transportation system effects were expected to cover a larger geographic area and a greater number of local and regional roadway facilities. Because this analysis is being prepared for the ARC project alone, the study area has been revised to focus on roadway facilities susceptible to being impacted by the ARC Project, particularly along the Mace Boulevard and East Covell Boulevard corridors. This results in fewer study intersections and roadway segments analyzed in this analysis when compared to those analyzed in the Certified Final EIR.

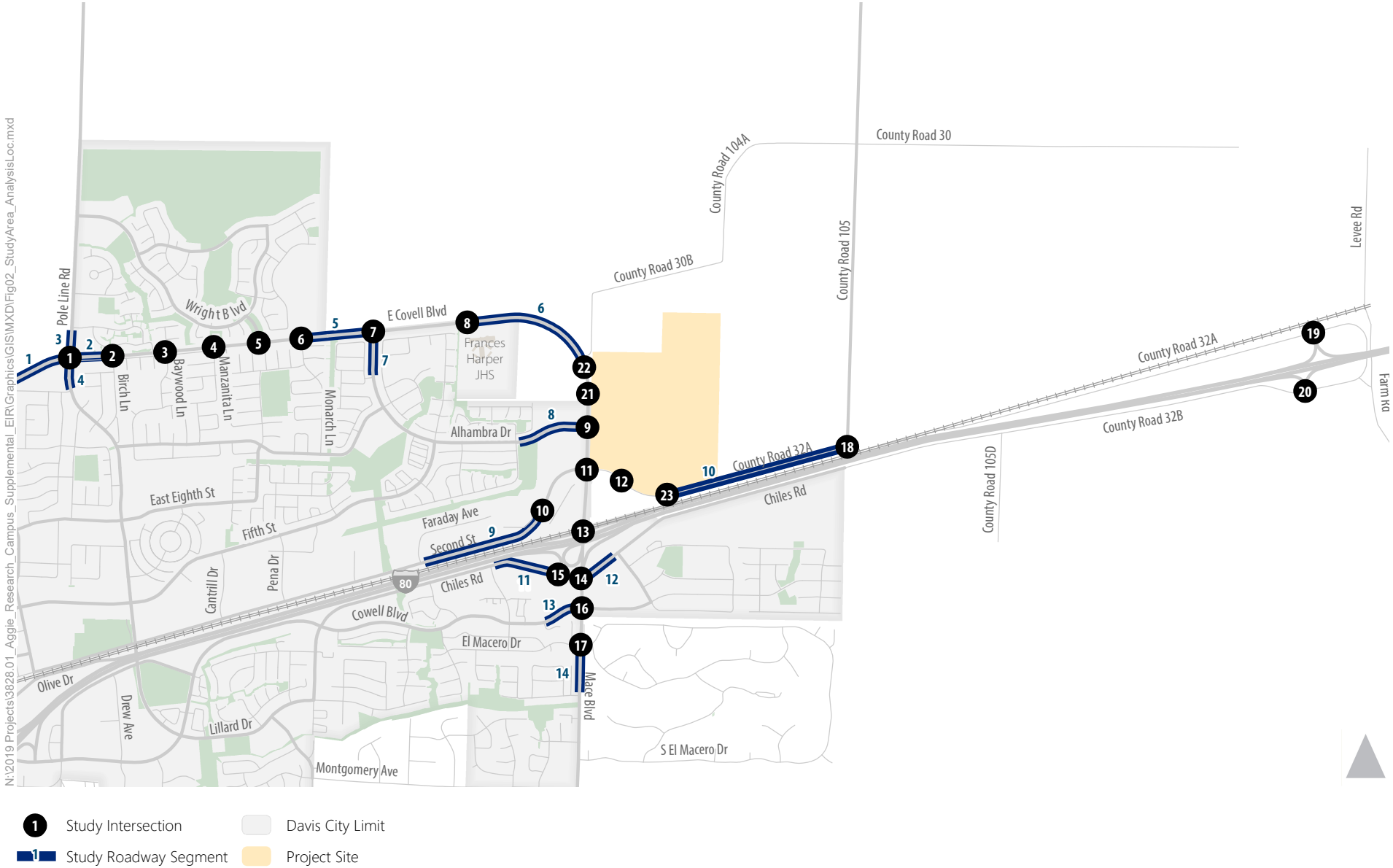

Figure 1

Study Area and Analysis Locations

Roadway System Operations

This study analyzes roadway operating conditions using intersection level of service (LOS) as a primary measure of operational performance. Motorized vehicle LOS is a qualitative measure of traffic flow from the perspective of motorists and is an indication of the comfort and convenience associated with driving. Typical factors that affect motorized vehicle LOS include speed, travel time, traffic interruptions, and freedom to maneuver. Empirical LOS criteria and methods of calculation have been documented in the *Highway Capacity Manual, 6th Edition* (HCM) published by the Transportation Research Board of the National Academies of Science (Transportation Research Board, 2016). The HCM defines six levels of service ranging from LOS A (representing free-flow vehicular traffic conditions with little to no congestion) to LOS F (oversaturated conditions where traffic demand exceeds capacity resulting in long queues and delays). The LOS definitions and calculations contained in the HCM are the prevailing measurement standard used throughout the United States and are used in this study. Motorized vehicle LOS definitions for signalized and unsignalized intersection are discussed below.

Study Intersections

The LOS at signalized intersections is based on the average control delay (i.e., delay resulting from initial deceleration, queue move-up time, time stopped on an intersection approach, and final acceleration) experienced per vehicle traveling through the intersection. **Table 1** summarizes the relationship between delay and LOS for signalized intersections.

Table 1: Signalized Intersection LOS Criteria

Level of Service	Description	Average Control Delay[1]
A	Volume-to-capacity ratio is low and either progression is exceptionally favorable or cycle length is very short.	≤ 10
B	Volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.	>10 to 20
C	Progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20 to 35
D	Volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	>35 to 55
E	Volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.	>55 to 80
F	Volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	>80

Note: [1] Average control delay presented in seconds per vehicle. Delay values are rounded to the nearest second and evaluated for LOS based on the above thresholds (i.e., 10 seconds per vehicle = LOS A).
Source: *Highway Capacity Manual, 6th Edition,* Transportation Research Board, 2016.

Similar to signalized intersections, the HCM 6th Edition methodology for stop-controlled intersections reports the LOS based on the control delay experienced by motorists traveling through the intersection. As shown in **Table 2**, the delay ranges for stop-controlled intersections are lower than for signalized intersections. The HCM anticipates that motorists expect signalized intersections to carry higher traffic volume that results in greater delay than a stop-controlled intersection. Stop controls are associated with more uncertainty as delays are less predictable, which can reduce users' delay tolerance.

Table 2: Stop-Controlled Intersection LOS Criteria

Level of Service	Average Control Delay[1]
A	≤ 10
B	>10 to 15
C	>15 to 25
D	>25 to 35
E	>35 to 50
F	>50

Note: [1] Average control delay presented in seconds per vehicle. Delay values are rounded to the nearest second and evaluated for LOS based on the above thresholds (i.e., 10 seconds per vehicle = LOS A).
Source: *Highway Capacity Manual, 6th Edition,* Transportation Research Board, 2016.

As described in Chapter 21 of the HCM 6th Edition, the LOS for all-way stop controlled intersections is based on the average control delay for the entire intersection. For side-street stop-controlled intersections, the LOS is determined separately for each minor-street movement (or shared movement) and may also be basis on major-street left-turn movements, per Chapter 20 of the HCM 6th Edition. However, in previous City of Davis traffic studies, the LOS for side-street stop-controlled intersections was based on the average control delay for the intersection as a whole.

To be consistent with both the HCM 6th Edition and recent City of Davis studies, this analysis documents the LOS for side-street stop-controlled intersections in two forms:

- Intersection LOS: based on the weighted average of the control delay experienced by each movement of the intersection. Note that this is not a recognized LOS metric for side-street stop-controlled intersections per the HCM 6th Edition. However, the City of Davis has previously expressed side-street stop-controlled intersection delay using this measure.
- Worst-case LOS: based on the movement (or shared movement) with the greatest control delay at the intersection, which may consist of minor-street stop-controlled movements or major street left-turns.

Note that the term LOS only applies to intersection delay as measured per the HCM 6th Edition. Other forms of assessing intersection delay are acceptable but they should not be associated with a LOS term that was only intended for the specific HCM measurement.

Use of Micro-Simulation Traffic Operations Analysis

This study analyzes 11 of the 23 existing study intersections using Trafficware's Synchro 10 software. Synchro 10 calculates the control delay consistent with the HCM methodology. These intersections are situated along Covell Boulevard between Pole Line Road and the Mace Boulevard curve, as well as along County Roads 32A and 32B. To account for the effects of turn-pocket overflows, vehicle queuing interactions between adjacent intersections, and interactions between vehicles, bicyclists, and pedestrians, micro-simulation analysis was performed for the remaining 12 study intersections along Mace Boulevard and at/near the I-80/Mace Boulevard interchange were analyzed using the SimTraffic micro-simulation software. It captures the nature of driver behavior and models the interaction between vehicles in a study network. SimTraffic better accounts for the effects of turn-pocket queue overflows, queue blocking, queue interactions between adjacent intersections, and pedestrian crossing interactions when compared to conventional, deterministic analysis methods, such as those outlined in the HCM 6th Edition and applied in Synchro 10. The SimTraffic model was calibrated and validated to existing conditions based on travel time data, peak hour volumes, and observed maximum queue lengths.

Because micro-simulation models rely on the random arrival of vehicles into the network, multiple runs are needed to provide a reasonable level of statistical accuracy and validity. The SimTraffic models were run up to twenty times (each using a different random seed number) and ten of those runs were selected and averaged to determine final model outputs. Selected runs were screened to exclude outliers that under- or over-emphasized delay compared to observed conditions.

Study Roadway Segments

The study roadway segments were evaluated based on the a.m. and p.m. peak hour traffic volumes. Roadway segment analysis is included for purposes of evaluating future year traffic operations. Intersections tend to govern peak hour traffic operations of the local roadway network since they represent the location where traffic movements conflict and capacity of the roadway segment is reduced based on the allocation of right-of-way by traffic control devices such as traffic signals. However, performing intersection analysis for future conditions beyond five to ten years can be speculative given the difficulty of accurately predicting inputs such as individual turning movement volumes and traffic signal operations. To gauge the adequacy of roadway capacity for future conditions, roadway segment analysis can be used instead. The specific methodology involves developing roadway segment volume thresholds correlated to peak hour LOS expectations based on the HCM 6th Edition.

The HCM procedures consider a variety of capacity factors associated with the type of roadway and how intersections are controlled but does not require forecasting individual turning movement volumes. The technical calculations used to derive the volume thresholds for each roadway type and LOS value are shown in **Table 3**.

Table 3: Roadway Segment LOS Criteria

Functional Class	Lanes	LOS Volume Threshold[1]				
		A	B	C	D	E
Arterial	2	-	-	980	1,450	1,690
	4	-	-	2,110	2,730	3,310
Collector	2	-	-	560	930	1,190
Highway	2	-	-	450	970	2,130
Freeway	2	1,270	2,070	2,950	3,650	4,160
	2 + Auxiliary	1,670	3,040	3,990	4,720	5,460
	3	1,910	3,120	4,430	5,470	6,240
	3 + Auxiliary	2,220	4,030	5,270	6,220	7.180
	4	2,490	4,070	5,810	7,210	8,230
	4 + Auxiliary	2,800	5,120	6,700	7,930	9,180

Note: Volumes for Arterials, Collectors, and Highways represent the peak hour two-way segment total. Volumes for Freeways represent peak hour one-way segment totals and thresholds are applied separately for each direction of travel.
Source: *Highway Capacity Manual, 6th Edition,* Transportation Research Board, 2016; Fehr & Peers, 2020.

Travel Demand Forecasting

For the purposes of forecasting traffic volumes for the study intersections and roadway segments, the local UC Davis/City of Davis travel demand model was utilized. This model has an original base year of 2016 and forecast years of 2030 and 2036. The model was developed in close coordination with the City of Davis and UC Davis in order to incorporate planned land use and transportation system changes both within the City and its sphere of influence and on the UC Davis campus. The coordination effort included the following elements of model development:

- **TAZ system –** The traffic analysis zone (TAZ) development included review by City and UC Davis staff to ensure sufficient detail for both existing and new growth areas.
- **Land use inputs –** Inputs were initially obtained from the SACOG 2012 parcel database used in developing regional model inputs for the 2016 SACOG MTP/SCS. These inputs were reviewed for each TAZ with City and UC Davis staff to develop a complete inventory representing 2016 conditions, which is the model's base year. Similarly, land use forecasts for 2030 and 2036 conditions were developed in cooperation with City staff and UC Davis staff. Land use forecasts for 2030 and 2036 were based on future land use changes throughout the region projected in the 2016 SACOG MTP/SCS. The land use forecasts were refined based on input from City staff and UC Davis staff according to planned City of Davis General Plan growth, planned UC Davis 2018 Long

Range Development Plan (LRDP) growth, approved development projects, pipeline development projects, and other reasonably foreseeable land development activities.

- **Roadway network inputs –** The Local Model roadway network was developed from GIS data representing local, collector, arterial, and freeway functional classifications. Input data included the number of travel lanes and free-flow travel speeds based on the previous UC Davis/City of Davis Local Model developed for the 2003 LRDP update, plus new data from field observations and Google Maps imagery. Capacity inputs for each roadway classification were estimated from reference documents including the HCM 6th Edition and the *Travel Demand Forecasting: Parameters and Techniques, National Cooperative Highway Research Program, Report 716*, (Transportation Research Board, 2012). Changes to the roadway networks for future year scenarios were provided by City and UC Davis staff as noted above.
- **Vehicle trip rates –** The vehicle trip rates were derived from a variety of sources including the UC Davis Campus Travel Survey, the California Household Travel Survey, local residential trip generation estimates based on observed traffic counts, and the Trip Generation Manual, 10th Edition (Institute of Transportation Engineers, 2017). The rates were estimated for the following trip purposes.
    - Home-Based Work (HBW): trips between a residence and a workplace
    - Home-Based Shop (HBS): trips between a residence and a retail destination
    - Home-Based School (HBK): trips between a residence and a school (K-12)
    - Home-Based Other (HBO): trips between a residence and any other destination
    - Non-Home-Based (OO): trips that do not begin or end at a residence, such as traveling from a workplace to a restaurant, or from a retail store to a bank
    - College (COLL): trips to and from a Community College
    - UC Davis (UCD): trips to and from UC Davis
    - Highway Commercial (HC): trips to and from highway commercial destinations
- **Vehicle trip lengths and external trip patterns –** The vehicle trip lengths and the proportion of vehicle trips that occur exclusively within the model area versus those that have origins or destinations external to the model area were obtained from the UC Davis Campus Travel Survey, the California Household Travel Survey, and the American Community Survey. This information was extracted for each trip purpose above. Trips traveling through the model area without stopping such as those on I-80, were estimated from the regional SACOG SACSIM model developed for the 2016 SACOG MTP/SCS.

- **Trip assignment –** Trip assignment relies on conventional algorithms that assign trips between origin and destination zones based on travel times that reflect the influence of roadway capacity and speeds. A unique aspect of the assignment process is that UC Davis generated trips had to be associated with parking areas on and off-campus since that is where trips start and end. These parking areas were mapped in collaboration with UC Davis staff and iterative testing of the assignment results was used to refine the association.

The UC Davis/City of Davis travel demand model was applied to generate study intersection traffic volume forecast inputs for the cumulative analysis scenarios described above, as well as to inform the distribution and assignment of project trips under all "plus project" analysis scenarios. Separate model runs were performed for each scenario and the model-produced volume forecasts were extracted for final adjustments to account for differences between the model's base year volume estimates and observed traffic counts. The adjustment involves isolating the incremental change in volume between the base year model and the future year analysis scenario and adding that difference to the baseline (2019) traffic counts. This adjustment process helps to minimize potential errors in the model's base year estimates and is based on the methodology contained in *Analytical Travel Forecasting Approaches for Project-Level Planning and Design, National Cooperative Highway Research Program (NCHRP) Report 765* (Transportation Research Board, 2014).

Roadway Operations Performance Criteria

The following criteria are used to identify operational deficiencies based on the traffic operations analysis.

City of Davis

Per the City of Davis General Plan Transportation Element, LOS E is the minimum acceptable LOS for the majority of intersections within the City, and for each City-operated study intersection in the study area. LOS F is acceptable for other areas (e.g., Downtown Davis and the Richards Boulevard corridor) as established in the General Plan and contingent on approval by the City Council. For the purposes of this analysis, adverse effects to City of Davis roadway operations are defined when the addition of project traffic would cause any of the following:

- For signalized intersections, cause overall intersection operations to deteriorate from an acceptable level (LOS E or better) to an unacceptable level (LOS F);
- For signalized intersections, exacerbate unacceptable (LOS F) operations by increasing an intersection's average delay by five seconds or more;

- For unsignalized intersections, cause the worst-case movement (or average of all movements for all-way stop-controlled intersections) to worsen from an acceptable level (LOS E or better) to an unacceptable level (LOS F) and meet the peak hour signal warrant;
- For unsignalized intersections that operate unacceptably (LOS F) and meet the peak hour signal warrant without the project, worsen operations by increasing the overall intersection's volume served by more than one percent; or
- For unsignalized intersections that operate unacceptably but do not meet the peak hour signal warrant without the project, add sufficient volume to meet the warrant.
- For roadway segments, cause peak hour operations to deteriorate from an acceptable level (LOS E or better) to an unacceptable level (LOS F).
- For roadway segments that operate unacceptably, cause an increase in volume by more than 10 percent. The 10 percent allowance is based on the normal fluctuation in weekday traffic that occurs and the level of variability associated with traffic forecasts.

Yolo County

Per the Yolo County General Plan, LOS C is the minimum acceptable LOS in the unincorporated county, except as specified on designated roadways. LOS D is the minimum acceptable LOS for County Road 32A. For the purposes of this analysis, adverse effects to Yolo County roadway operations are defined when the addition of project traffic would cause any of the following:

- For intersections in the unincorporated county with the exceptions noted below, cause peak hour intersection operations to deteriorate from an acceptable level (LOS C) to an unacceptable level (LOS D or worse);
- For intersections on County Road 32A, cause peak hour intersection operations to deteriorate from an acceptable level (LOS D) to an unacceptable level (LOS E or worse);
- An intersection or roadway segment operates unacceptably under a no project scenario and the project adds 10 or more peak hour trips;
- The project adds 100 daily passenger vehicle trips (or Truck Trip Equivalencies) to an existing roadway that does not meet current County design standards (e.g., structural section, horizontal and vertical curves, lane and shoulder width, etc.); or
- The addition of project traffic causes an all-way stop-controlled or side street stop-controlled intersection to meet MUTCD signal warrant criteria.

Caltrans

Caltrans' Local Development – Intergovernmental Review Program (LD-IGR) provides guidance on the evaluation of traffic effects on State highway facilities. In light of Senate Bill 743 and related changes to

the CEQA Guidelines, Caltrans has announced in its *Caltrans Draft VMT-Focused Transportation Impact Study Guide (Caltrans, February 2020)* that it will use VMT as the CEQA transportation impact metric for projects on the State highway system and has indicated it will rely on the Governor's Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA* when preparing LD-IGR comments on local agency land use projects.

To analyze potential LOS impacts to the State highway system, this study utilizes the performance expectations established in the Caltrans District 3 Interstate 80 Transportation Concept Report (TCR) (August 2017). According to the I-80 TCR, the horizon year LOS for I-80 within the study area (including ramp terminal intersections) is LOS F. Therefore, LOS F is considered the design operating goal on the I-80 mainline and at I-80 ramp terminal intersections. However, for the purposes of this traffic analysis, significant traffic impacts to I-80 are defined when the addition of proposed project traffic causes any of the following:

- For signalized intersections, causes operations to deteriorate to LOS F and increases an intersection's average delay by five seconds or more;
- For signalized intersections, exacerbate LOS F operations by increasing an intersection's average delay by five seconds or more;
- For unsignalized intersections, causes the worst-case movement (or average of all movements for all-way stop-controlled intersections) to deteriorate to LOS F and meet the California Manual on Uniform Traffic Control Devices (MUTCD) peak hour signal warrant;
- For unsignalized intersections that operate at LOS F and meet MUTCD's peak hour signal warrant without the project, exacerbate operations by increasing the overall intersection's volume by more than one percent;
- For freeway segments, causes operations to deteriorate to LOS F and increases peak hour traffic volume by more than five percent;
- For freeway segments, exacerbate LOS F operations by increasing peak hour traffic volume by more than five percent; or
- Causes off-ramp queues to spill onto freeway.

3. Existing Conditions

Intersection turning movement counts were conducted during the morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) peak periods on Thursday, May 30, 2019 and Thursday, October 16, 2019. Intersection counts included volumes for vehicles, bicyclists, and pedestrians. During the traffic counts, local schools and UC Davis were in regular session and weather conditions were dry and clear. Based on the traffic data collection, the a.m. peak hour within the study area occurred from 7:45 to 8:45 a.m., and the p.m. peak hour occurred from 5:00 to 6:00 p.m.. Peak hour traffic volumes derived from the intersection turning movement counts are illustrated in the Appendix.

Additionally, peak period field observations were conducted by Fehr & Peers staff during the peak period traffic counts. The field observations, including observed maximum queues, were utilized to calibrate the existing conditions traffic operations analysis described in the subsequent section.

Table 3 presents the a.m. and p.m. peak hour LOS for each study intersection under existing conditions.

During the a.m. peak hour, vehicle traffic within the study area generally progresses smoothly. Queues generally do not extend to the adjacent upstream intersection and clear within one cycle at signalized intersections.

During the p.m. peak hour, considerable delay and queuing occurs on local roadways within the vicinity of the Mace Boulevard interchange at I-80. Field observations, data collection, and analysis conducted by Fehr & Peers over the past year indicate that these conditions can be attributed to the following factors:

- Diverted local and regional traffic onto study area roadways due to extended periods of very low travel speeds on eastbound I-80 from the causeway, through Davis, and into Solano County. During congested conditions, low mainline travel speeds substantially increase travel times for motorists on eastbound I-80. Hence, diverting off of I-80 onto local roadways often provides a faster alternative to remaining on the freeway through Davis. Similarly, locally generated traffic utilizing eastbound I-80 can experience faster travel times by accessing I-80 as far east as possible (e.g., motorists departing Downtown Davis for Sacramento accessing I-80 at Mace Boulevard or CR 32A instead of Richards Boulevard). Moreover, the increased prevalence and use of navigation apps (e.g., Google Maps, WAZE, etc.) in recent years provides motorists with real-time and predictive travel time information that can influence route selection.
- Ramp metering at the eastbound I-80 on-ramps controls the amount of study area traffic that can enter the freeway from Mace Boulevard. The ramp meters are designed to improve operating conditions on eastbound I-80 by increasing or decreasing on-ramp flow rates according to

mainline traffic volumes. Therefore, when congested conditions occur on eastbound I-80, flow rates decrease for the Mace Boulevard on-ramps, causing additional delays and queueing on Mace Boulevard and connecting local roadways.

Based on field observations by Fehr & Peers staff and anecdotal information provided by City staff, these conditions are particularly prevalent on Wednesday, Thursday, and Friday afternoons and evenings.

On the day that p.m. peak period traffic counts were collected for this study (Thursday, October 16, 2019), field observations indicated that congested conditions were present on both eastbound I-80 and local roadways surrounding the Mace Boulevard interchange. Queue spillbacks were observed on southbound Mace Boulevard from the eastbound I-80 on-ramp to beyond Alhambra Drive and on northbound Mace Boulevard from the eastbound I-80 on-ramp to beyond San Marino Drive. Queue spillbacks were also observed on eastbound and westbound Chiles Road near the I-80 on-ramp. This congestion is reflected in the results in shown in Table 3.

4. Existing Plus Project Conditions

Project trips were assigned to the study intersections and driveways in accordance with the expected trip generation described in Chapter 5 of Volume 1, and the geographic distribution of project trips, which was determined based existing travel patterns, relative travel times between competing routes, and complementary land uses (i.e., likely residence locations for project employees).

Project Effects Within the Project Vicinity

Table 4 displays intersection LOS and delay under existing plus project conditions. Technical calculations are provided in the Appendix. This table indicates that the intersections along Mace Boulevard at Alhambra Boulevard and Second Street would degrade from LOS C or better under current conditions to LOS F with the project during the a.m. and p.m. peak hours. During the a.m. peak hour, vehicle queues on the I-80 EB off-ramp approach to Chiles Road would spill back onto the freeway mainline.

All project accesses along Mace Boulevard and County Road 32A would operate at LOS F during one or both peak hours. Initial micro-simulation model runs showed that motorists traveling eastbound on East Covell Boulevard toward southbound Mace Boulevard would experience considerable queuing due to this congestion along the project site. Accordingly, it is expected that some background trips as well as project trips would divert to Alhambra Boulevard (a two-lane collector street) to bypass this congestion. This traffic reassignment was incorporated into the Existing Plus Project analysis.

Table 5 displays the 95th percentile freeway off-ramp queue at the I-80/Mace Boulevard/Chiles Road and I-80/County Road 32A interchanges under Existing Plus Project conditions. Technical calculations are provided in the Appendix. This table indicates that the 95th percentile vehicle queues at the Mace Boulevard and Chiles Road off-ramps would spill back onto the freeway mainline during the a.m. peak hour.

Table 4: Peak Hour Intersection Operations – Existing Plus Project Conditions

Intersection	Traffic Control	Jurisdiction	Existing Conditions				Existing Plus Project Conditions			
			A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. E. Covell Blvd./ Pole Line Road	Signal	City of Davis	24	C	32	C	30	C	39	D
2. E. Covell Blvd./ Birch Lane	TWSC	City of Davis	12	B	14	B	14	B	14	B
3. E. Covell Blvd./ Baywood Lane	TWSC	City of Davis	2 (34)	A (D)	1 (44)	A (E)	2 (89)	A (F)	2 (102)	A (F)
4. E. Covell Blvd./ Manzanita Lane	TWSC	City of Davis	1 (26)	A (D)	1 (35)	A (D)	2 (58)	A (F)	2 (74)	A (F)
5. E. Covell Blvd./ Wright Blvd.	Signal	City of Davis	9	A	8	A	9	A	9	A
6. E. Covell Blvd./ Monarch Lane	TWSC	City of Davis	2 (23)	A (C)	1 (34)	A (D)	3 (61)	A (F)	2 (83)	A (F)
7. E. Covell Blvd./ Alhambra Drive	Signal	City of Davis	10	A	9	A	8	A	14	B
8. E. Covell Blvd./ Harper Jr. H.S.	Signal	City of Davis	11	A	5	A	45	D	14	B
9. Mace Blvd./ Alhambra Dr./ South ARC Driveway	Signal	City of Davis	17	B	21	C	**159**	**F**	**166**	**F**
10. Second Street/ Fermi Place/ Target Driveway	Signal	City of Davis	7	A	15	B	7	A	41	D
11. Mace Blvd./ Second Street/ CR 32A	Signal	City of Davis	34	C	27	C	**155**	**F**	**145**	**F**
12. CR 32A/Mace Park-and-Ride Driveway/West ARC Driveway	TWSC	Yolo County/City of Davis[2]	1 (4)	A (A)	2 (6)	A (A)	6 (18)	A (C)	**107 (605)**	**F (F)**
13. Mace Blvd./I-80 WB Ramps	Signal	Caltrans	20	C	48	D	78	E	70	E

14. Mace Blvd./ Chiles Road	Signal	City of Davis	33	C	69	E	59	E	77	E
15. Chiles Road/ I-80 EB Ramp	Signal	Caltrans	11	B	41	D	**383**	**F**	**131**	**F**
16. Mace Blvd./ Cowell Blvd.	Signal	City of Davis	21	C	68	E	22	C	65	E
17. Mace Blvd./ El Macero Drive	AWSC	City of Davis	8	A	28	D	8	A	34	D
18. CR 32A/CR 105	TWSC	Yolo County	5 (9)	A (A)	7 (10)	A (B)	8 (11)	A (B)	22 (28)	C (D)
19. CR 32A/ I-80 WB Ramps	TWSC	Caltrans	6 (10)	A (A)	4 (12)	A (B)	9 (14)	A (B)	**12 (59)**	**B (F)**
20. CR 32B/ Chiles Rd./ I-80 EB Ramps[1]	TWSC	Caltrans	4 (12)	A (B)	5 (9)	A (A)	3 (12)	A (B)	**4 (14)**	**A (B)**
21. Mace Blvd./ Central ARC Driveway	TWSC	City of Davis	-	-	-	-	59 (101)	E (F)	**32 (69)**	**D (F)**
22. Mace Blvd./ CR 30B/North ARC Driveway	TWSC	City of Davis	-	-	-	-	**143 (230)**	**F (F)**	**55 (325)**	**F (F)**
23. CR 32A/East ARC Driveway	TWSC	Yolo County/City of Davis[2]	-	-	-	-	3 (11)	A (B)	**56 (177)**	**F (F)**

Notes: For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For two-way stop-controlled intersections, average intersection delay is reported in seconds per vehicle for all approaches with the delay and LOS for the worst-case movement reported in parentheses.
Shaded cells indicate locations with unacceptable peak hour LOS.
Shaded and bold cells indicate locations where the project would cause adverse effects to peak hour intersection operations in accordance with the performance criteria.
TWSC = Two-Way Stop Control. AWSC = All-Way Stop Control. "-" = Does not exist.
[1] P.M. peak hour LOS does not match observed conditions due to the freeway ramp meter and on-ramp vehicle demand (Synchro traffic operations analysis software cannot capture the operational effects of ramp metering). Field observations indicate that the eastbound left-turn and westbound right-turn operate at LOS F during the p.m. peak hour under existing conditions. The addition of the project would exacerbate these conditions.
[2] The segment of CR 32A along the ARC site southern frontage would be annexed into the City of Davis along with the project site. Thus, City of Davis performance criteria related to roadway performance would apply to study intersections #12 and #23 under Existing Plus Project conditions.
Source: Fehr & Peers, 2020.

Table 5: Freeway Off-Ramp Queuing – Existing Plus Project Conditions

Off-Ramp	Off-Ramp Distance[1]	95th Percentile Queue Length[2]			
		Existing Conditions		Existing Plus Project Conditions[3]	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
Mace Boulevard/I-80 WB Off-Ramp	1,200 feet	175 feet	175 feet	1,900 feet	700 feet
Chiles Road/I-80 EB Off-Ramp	1,100 feet	100 feet	100 feet	3,300 feet	225 feet
CR 32A/I-80 WB Off-Ramp	1,200 feet	25 feet	25 feet	75 feet	175 feet
Chiles Road/CR 32B/I-80 EB Off-Ramp	1,000 feet	25 feet	75 feet	25 feet	75 feet

Notes: [1] Measured from the intersection stop bar to the gore point of the freeway off-ramp. Does not include auxiliary lane on freeway mainline.
[2] Results at the Mace Boulevard/Chiles Road interchange are based on results from SimTraffic micro-simulation model. Results at the County Road 32A interchange are based on results from Synchro traffic operations analysis software. Queues are maximum per lane, rounded to the nearest 25 feet.
[3] Shaded cells represent conditions in which the queue would spill onto the freeway mainline.
Source: Fehr & Peers, 2020.

Potential Operational Enhancements

Through an iterative process using the SimTraffic micro-simulation model, the following physical improvements and signal timing changes were identified to enhance roadway operations in the study area under Existing Plus Project conditions (see **Figure 2**):

- Southbound Mace Boulevard: Extend the second eastbound/southbound lane from Harper Junior High School to Alhambra Drive. Add a third southbound lane from Second Street to connect with the dedicated right-turn lane onto the I-80 WB on-ramps.
- Northbound Mace Boulevard: Extend the third northbound lane from the I-80 WB off-ramps to connect with a new northbound "trap" right-turn lane at the Mace Boulevard/Second Street/County Road 32A intersection. Add a second northbound/westbound lane from Alhambra Drive to the Harper Junior High School signalized intersection.
- Mace Boulevard/Chiles Road and Chiles Road/I-80 EB Off-Ramp Intersections: This pair of tightly spaced intersections (situated 450 feet apart) requires signal coordination/timing adjustments and a lane reassignment on the eastbound Chiles Road approach to Mace Boulevard due to the heavy project-related off-ramp volume during the a.m. peak hour. Modifying the eastbound through lane to a shared left/through lane would require the east and west approaches to operate with split phasing. Signal coordination (particularly critical during the a.m. peak hour) would synchronize the green interval for the I-80 off-ramp movement with the eastbound approach on Chiles Road at Mace Boulevard to facilitate the flow of motorists off of I-80. The signal would be modified to operate the southbound left-turn and westbound right-turn during a shared overlap phase. This modification would also require the prohibition of southbound U-turns.
- I-80 Eastbound Loop On-Ramp: This on-ramp consists of a single entry lane from southbound Mace Boulevard, which widens to a metered general purpose lane and an unmetered HOV bypass lane. During the p.m. peak hour, the addition of project trips would cause queue spillback from the ramp meter onto the overpass, thereby causing queue spillback to extend further upstream. The recommended modification from an unmetered HOV bypass lane to a metered general purpose lane was found to provide more ramp metering storage, and reduced effects on the surface street. Similar modifications have been considered by Caltrans elsewhere in the Sacramento region.
- Mace Boulevard/Second Street/County Road 32A Intersection: Modify the northbound approach to add a "trap" right-turn lane. Modify the westbound approach to two left-turn lanes and a shared through-right lane. Modify westbound County Road 32A between this intersection and the adjacent County Road 32A/Mace park-and-ride/West ARC Driveway intersection to two through lanes.

- Mace Boulevard/Alhambra Drive/South ARC Driveway Intersection: Modify the westbound approach to two left-turn lanes and a shared through-right lane. Provide a southbound left-turn lane, two through lanes, and a right-turn lane.
- Mace Boulevard/County Road 30B/North ARC Driveway Intersection: Install a traffic signal. Provide a southbound left-turn lane and two through lanes. Provide a northbound through lane and shared through-right lane. Provide an eastbound left-turn lane.
- County Road 32A/Mace park-and-ride/West ARC Driveway Intersection: Install a traffic signal. Provide a southbound left-turn lane and a shared through-right lane.

Table 6 displays the resulting intersection delay and LOS under Existing Plus Project conditions with these operational enhancements in place. Technical calculations are provided in the Appendix. This table indicates that the total number of intersections operating with an average intersection LOS of LOS F during one or both peak hours would be decreased from seven to zero.

Note that while the improvements listed above provide benefits to peak hour roadway operations for vehicles, they could diminish the bicycle and pedestrian environment by increasing crossing distances and bicycle and pedestrian exposure times at intersections. Moreover, the additional roadway capacity resulting from these improvements could induce additional vehicle miles traveled (VMT) on study area roadways. Existing evidence indicates that Covell Boulevard, Mace Boulevard, and connecting roadways such as Second Street and Chiles Road are utilized as regional cut-through routes when I-80 experiences significant speed reductions and delays during p.m. peak periods. Therefore, improving operations and reducing delays along these local roadways could increase the attractiveness of these routes as alternatives to I-80 and induce additional regional cut-through activity on local roadways. Parallel local routes require longer trip distances than remaining on I-80, therefore, regional travel demand use of local routes would yield more VMT than use of I-80.

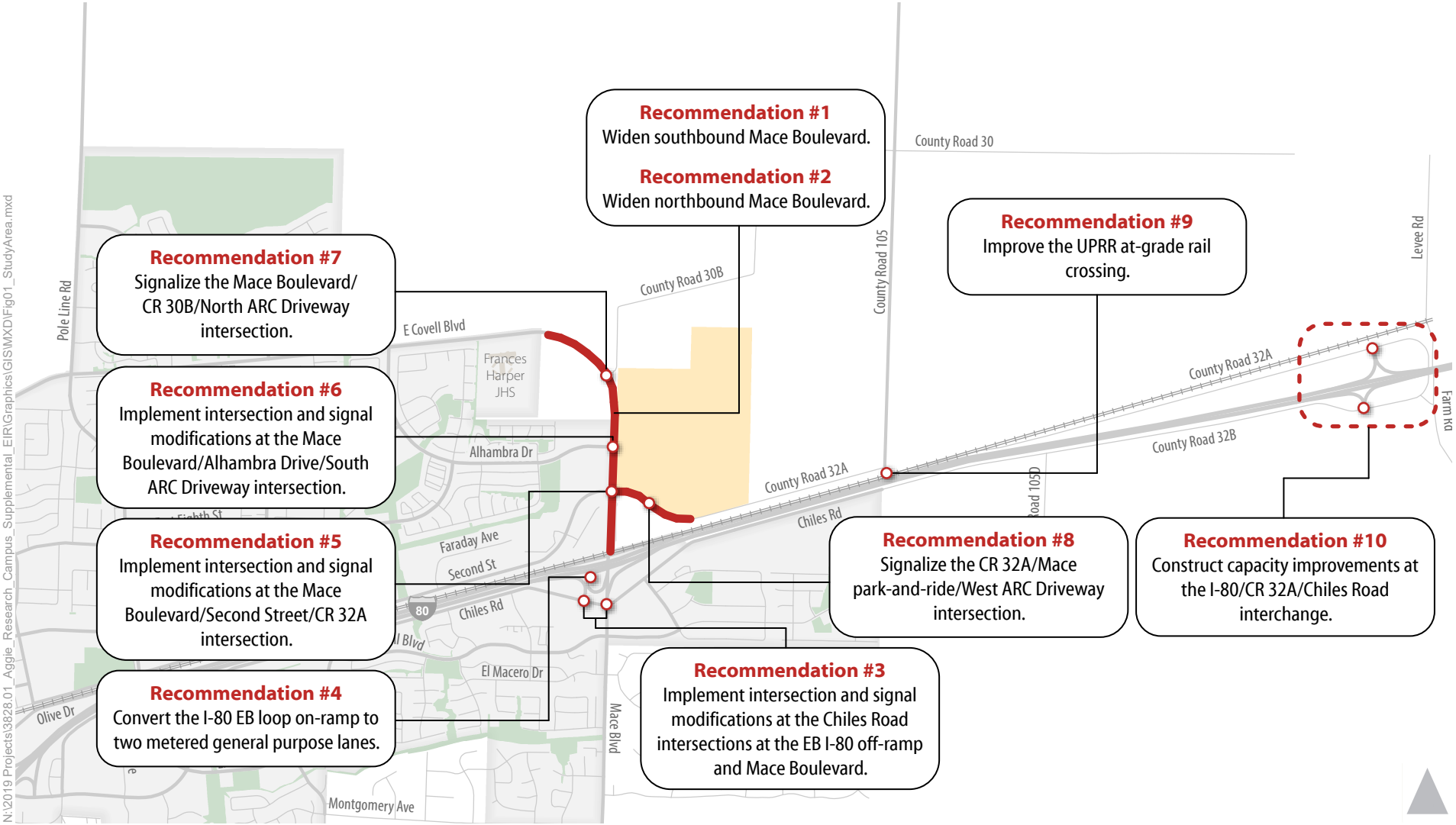

Figure 2

Proposed Operational Enhancements

Table 6: Peak Hour Intersection Operations – Existing Plus Project Conditions with Potential Operational Enhancements

Intersection	Traffic Control	Jurisdiction	Existing Conditions				Existing Plus Project Conditions				Existing Plus Project Conditions with Potential Operational Enhancements			
			A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
7. E. Covell Blvd./ Alhambra Drive	Signal	City of Davis	10	A	9	A	8	A	14	B	10	A	20	B
8. E. Covell Blvd./ Harper Jr. H.S.	Signal	City of Davis	11	A	5	A	45	D	14	B	17	B	17	B
9. Mace Blvd./ Alhambra Dr./ South ARC Driveway	Signal	City of Davis	17	B	21	C	**159**	**F**	**166**	**F**	26	C	49	D
10. Second Street/ Fermi Place/ Target Driveway	Signal	City of Davis	7	A	15	B	7	A	41	D	7	A	18	B
11. Mace Blvd./ Second Street/ CR 32A	Signal	City of Davis	34	C	27	C	**155**	**F**	**145**	**F**	60	E	67	E
12. CR 32A/Mace Park-and-Ride Driveway/West ARC Driveway	TWSC/ Signal	Yolo County/City of Davis[1]	1 (4)	A (A)	2 (6)	A (A)	6 (18)	A (C)	**107 (605)**	**F (F)**	17	B	21	C
13. Mace Blvd./I-80 WB Ramps	Signal	Caltrans	20	C	48	D	78	E	70	E	51	D	38	D

14. Mace Blvd./ Chiles Road	Signal	City of Davis	33	C	69	E	59	E	77	E	50	D	59	E
15. Chiles Road/ I-80 EB Ramp	Signal	Caltrans	11	B	41	D	**383**	**F**	**131**	**F**	23	C	71	E
16. Mace Blvd./ Cowell Blvd.	Signal	City of Davis	21	C	68	E	22	C	65	E	38	D	33	C
17. Mace Blvd./ El Macero Drive	AWSC	City of Davis	8	A	28	D	8	A	34	D	10	A	9	A
21. Mace Blvd./ Central ARC Driveway	TWSC	City of Davis	-	-	-	-	59 (101)	E (F)	**32 (69)**	**D (F)**	3 (4)	A (A)	3 (7)	A (A)
22. Mace Blvd./ CR 30B/North ARC Driveway	TWSC/ Signal	Yolo County	-	-	-	-	**143 (230)**	**F (F)**	**55 (325)**	**F (F)**	21	C	4	A
23. CR 32A/East ARC Driveway	TWSC	Yolo County/City of Davis[1]	-	-	-	-	3 (11)	A (B)	**56 (177)**	**F (F)**	4 (12)	A (B)	16 (42)	C (E)

Notes: For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For two-way stop-controlled intersections, average intersection delay is reported in seconds per vehicle for all approaches with the delay and LOS for the worst-case movement reported in parentheses.
Shaded cells indicate locations with unacceptable peak hour LOS.
Shaded and bold cells indicate locations where the project would cause adverse effects to peak hour intersection operations in accordance with the performance criteria.
TWSC = Two-Way Stop Control. AWSC = All-Way Stop Control. "-" = Does not exist.
[1] The segment of CR 32A along the ARC site southern frontage would be annexed into the City of Davis along with the project site. Thus, City of Davis performance criteria related to roadway performance would apply to study intersections #12 and #23 under Existing Plus Project conditions.

Source: Fehr & Peers, 2020.

Table 7 summarizes how the percentage of peak hour travel demand is able to be served within the portion of the study area covered by the micro-simulation model (i.e., along Mace Boulevard from east of Harper Junior High School southerly to El Macero Drive and including the connections to I-80, Chiles Road, and County Road 32A). When the percent demand served drops well below 100 percent, the demand for travel cannot be served within a single hour due to either upstream or downstream bottlenecks. This can lead to 'peak hour spreading', which is generally defined as more than one hour of congested, stop-and-go conditions. As shown in the table, the project causes the system-wide percent demand served to decrease to 82 percent during the a.m. peak hour and 85 percent during the p.m. peak hour. With the potential operational enhancements, these percentages increase to 99 percent during the a.m. peak hour and 97 percent during the p.m. peak hour, a substantial improvement. This table also shows the substantial benefit these improvements would offer at individual intersections.

Lastly, **Table 8** illustrates how the operational enhancements would benefit freeway off-ramp queuing at the I-80/Mace Boulevard interchange. As shown, vehicle queues would no longer spill back onto the I-80 mainline with implementation of these enhancements.

Table 7: Percent of Peak Hour Demand Served – Existing Plus Project Conditions with Potential Operational Enhancements

Location	Existing Conditions[1]				Existing Plus Project Conditions[1]				Existing Plus Project Conditions with Potential Operational Enhancements[1,2]			
	A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)
Overall System[3]	14,246	14,231 (100%)	15,332	14,844 (97%)	20,185	16,526 (82%)	20,538	17,555 (85%)	20,192	19,923 (99%)	20,551	20,014 (97%)
Mace Boulevard/ Alhambra Drive	1,767	1,750 (99%)	1,746	1,725 (99%)	2,959	2,383 (81%)	2,928	2,513 (86%)	2,959	2,925 (99%)	2,928	2,869 (98%)
Mace Boulevard/ Second Street	2,655	2,652 (100%)	2,917	2,899 (99%)	4,040	3,288 (81%)	4,207	3,534 (84%)	4,040	3,989 (99%)	4,207	4,081 (97%)
Mace Boulevard/ I-80 WB Ramps	3,172	3,169 (100%)	3,066	2,983 (97%)	4,409	3,669 (83%)	4,066	3,503 (86%)	4,409	4,322 (98%)	4,066	3,933 (97%)
Mace Boulevard/ Chiles Road	2,529	2,535 (100%)	2,746	2,558 (93%)	3,138	2,496 (80%)	3,078	2,681 (87%)	3,145	3,072 (98%)	3,091	3,011 (97%)

Notes: [1] Based on results of SimTraffic micro-simulation model.
[2] Refer to Figure 2 for an illustration of potential operational enhancements.
[3] Includes study intersections 9 through 17.
Source: Fehr & Peers, 2020.

Table 8: Freeway Off-Ramp Queuing – Existing Plus Project Conditions with Potential Operational Enhancements

Off-Ramp	Off-Ramp Distance[1]	95th Percentile Queue Length[2]					
		Existing Conditions		Existing Plus Project Conditions[3]		Existing Plus Project Conditions with Potential Operational Enhancements[3]	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
Mace Boulevard/ I-80 WB Off-Ramp	1,200 feet	175 feet	175 feet	1,900 feet	700 feet	825 feet	175 feet
Chiles Road/I-80 EB Off-Ramp	1,100 feet	100 feet	100 feet	3,300 feet	225 feet	250 feet	175 feet

Notes: [1] Measured from the intersection stop bar to the gore point of the freeway off-ramp. Does not include auxiliary lane on freeway mainline.
[2] Results at the Mace Boulevard/Chiles Road interchange are based on results from SimTraffic micro-simulation model.
[3] Shaded cells represent conditions in which the queue would spill onto the freeway mainline.
Source: Fehr & Peers, 2020.

Project Effects Beyond the Project Vicinity

The proposed project would add several hundred new peak hour vehicle trips between the project site and the I-80/County Road 32A interchange located to the east of the project site. These trips would be generated by project employees and residents traveling between the project site and Sacramento (and surrounding communities) via the I-80 causeway. These trips are expected to utilize the I-80/County Road 32A interchange instead of the I-80/Mace Boulevard interchange due to delays on Mace Boulevard within the interchange vicinity that would make use of the I-80/County Road 32A interchange more attractive from a travel time standpoint.

These additional project vehicle trips would primarily use County Road 32A to travel between the project site and the I-80/County Road 32A interchange. This would have the following adverse effects on multimodal operations:

- Adverse effects to the UPRR at-grade rail crossing: UPRR operates an at-grade rail crossing of County Road 32A immediately south of the County Road 32A/County Road 105 stop-controlled intersection. It is not uncommon for trespassing events (i.e., vehicles on the tracks) and vehicle-train collisions to occur at this location due to the current physical configuration of the crossing. Yolo County, together with Union Pacific and the City of Davis, is currently evaluating potential modifications to this at-grade crossing to reduce the potential for conflicts with rail operations. The addition of several hundred peak hour project vehicle trips could increase the potential for conflicts with rail operations at this location.
- Adverse effects to the I-80/County Road 32A interchange: The I-80/County Road 32A interchange experiences high volumes of vehicle trips during the p.m. peak hour, particularly on days when regional cut-through activity is prevalent. The combination of high travel demand and the ramp meter at the Chiles Road/I-80 EB on-ramp causes substantial peak hour delay and queuing on roadways within the interchange vicinity, particularly on eastbound and westbound Chiles Road near the I-80 EB ramps (near the Yolo Fruit Stand) and eastbound County Road 32A (due to queue spillback from the I-80 EB on-ramp). The addition of several hundred peak hour project trips would exacerbate these conditions.

Potential Operational Enhancements

The following operational improvements would lessen the adverse effects of the project described above:

- UPRR at-grade rail crossing improvements: The UPRR track/County Road 32A crossing should be converted from an at-grade crossing to a grade-separated crossing. A near-term improvement prior to provision of the grade separation would consist of relocating the County Road 32A/County Road 105 intersection about 200 feet to the north and installing double gates on the south approach to the grade crossing in order to improve safety and traffic functionality at the grade crossing.

- I-80/County Road 32A interchange improvements: Construct capacity improvements at the County Road 32 interchange and along County Road 32A to allow this interchange to serve more project traffic, including:
    - Reconstruction, widening, and potential relocation to the west, of the eastbound and westbound on- and off-ramps to provide more storage capacity, and to provide traffic signals or roundabouts at the ramp terminal intersections. Provision of an auxiliary lane between the relocated eastbound on-ramp merge and the causeway structure.
    - Re-configuration of the County Road 32A/County Road 105 intersection to provide uninterrupted County Road 32A flow with County Road 105 under stop control.

The improvements described above would require coordination with and approvals by Yolo County, UPRR, and Caltrans. The timing of each improvement relative to the ARC project should be addressed in the focused transportation impact studies prepared for each phase of development of the ARC project. The project should make a fair share funding contribution towards each improvement.

Project Effects on Freeways

Regional and corridor analysis by SACOG, MTC, and Caltrans have already evaluated I-80 within the vicinity of the project site. These analyses include the following documents:

- 2016 SACOG MTP/SCS (SACOG 2016). This document is the RTP for the six-county Sacramento region, which includes Yolo County.
- District System Management and Development Plan, Caltrans District 3 (Caltrans 2013).
- I-80 and Capital City Freeway Corridor System Management Plan (Caltrans 2009).
- Transportation Concept Report I-80, District 3 (Caltrans 2017).
- Transportation Concept Report SR 113, District 3 (Caltrans 2014).
- Interstate 80/United States 50 Davis to Downtown Sacramento Preliminary Investigation (Caltrans 2014).
- I-80/Richards Blvd Interchange Project Study Report – Project Development Support (PSR-PDS) (Caltrans 2017).
- Plan Bay Area 2040 (MTP and ABAG 2017). This document is the RTP/SCS for the nine-county Bay Area region, which includes Solano County.
- Caltrans District 4 Transportation System Development Plan (Caltrans 2011).
- I-80 East Corridor System Management Plan District 4 (Caltrans 2017).

Of the various studies, Caltrans analysis tends to be the most detailed with regards to roadway operations performance. According to the I-80/United States US 50 Davis to Downtown Sacramento Preliminary Investigation, District 3 (Caltrans 2014), much of the I-80 corridor in the study area has low travel speeds

during the p.m. peak period while the a.m. peak period has a few isolated areas of low travel speeds (see graphic below). As shown in the graphic below, I-80 travelers experience slow speeds (i.e., LOS F conditions) for select westbound locations during the morning peak period and more severe and extended areas of slow speeds in the eastbound direction during the evening peak period. More recent observed conditions reveal that a.m. and p.m. traffic speeds have continued to degrade such that more segments of I-80 perform poorly over extended periods of time.

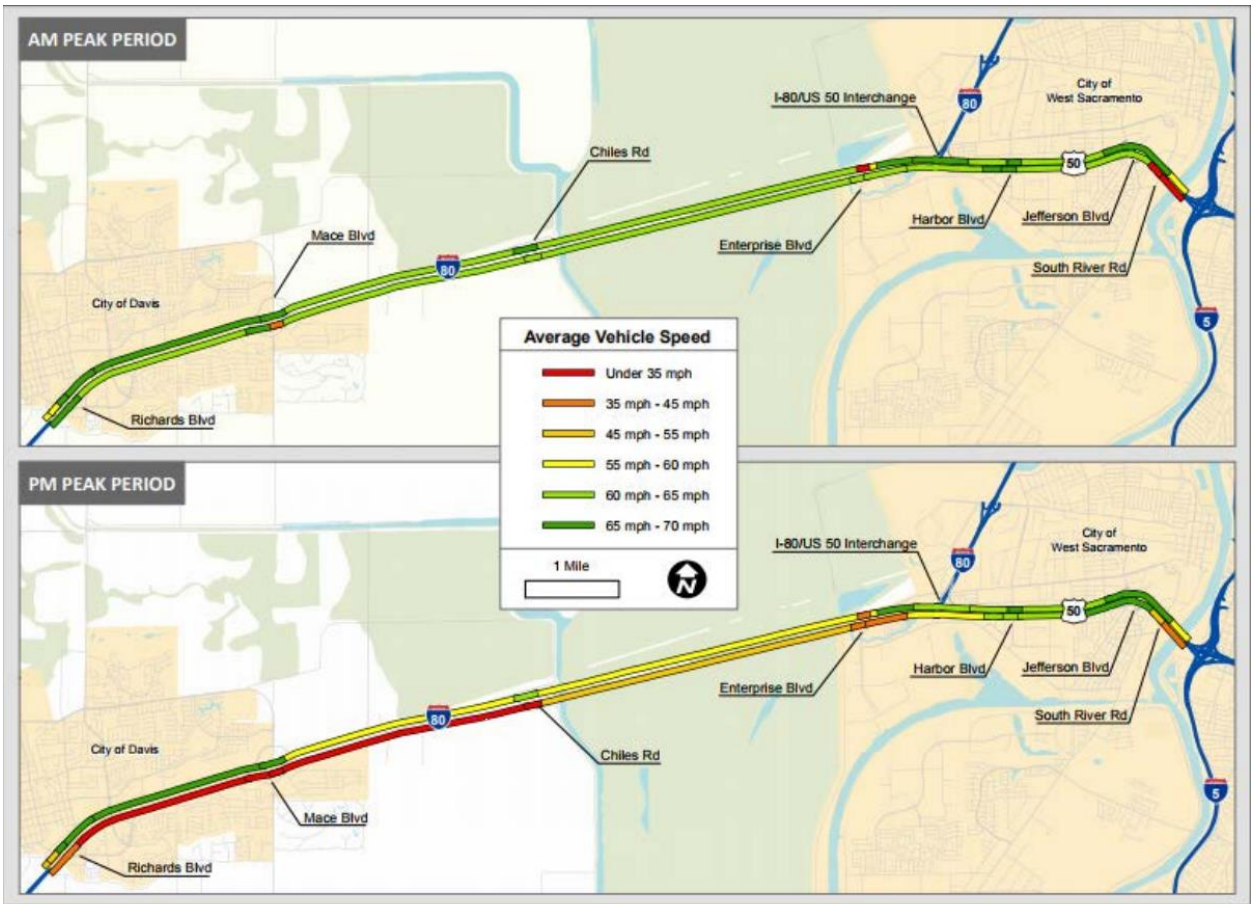

FIGURE 5: Existing Conditions - Segmental Travel Speed (from microsimulation model)

The Caltrans District 3 Interstate 80 Transportation Concept Report (Caltrans 2017) describes existing and anticipated future operating conditions on I-80 throughout the greater Sacramento area. As documented in the I-80 TCR, the segment of I-80 between Mace Boulevard and West Sacramento (Post Mile 2.68 to 9.55) operates at LOS F (see table image below).

SYSTEM CHARACTERISTICS, CONCEPT FACILITY, AND CORRIDOR PERFORMANCE

Figure 2

SYSTEM CHARACTERISTICS AND CONCEPT FACILITY															BASIC SYSTEM OPERATIONS						
				Existing Facility Base Year					Concept Facility Horizon Year						Level of Service (LOS)				Average Daily Traffic (ADT)		
				Base Year (BY)					Build Facility-Horizon Year (HY)					Ultimate Facility (HY)							
Segment	County	Post Miles (Begin/End)		Facility Type	General Purpose Lanes	Centerline Miles	Lane Miles	Designated Lane	Facility Type	General Purpose Lanes	Centerline Miles	Lane Miles	Designated Lane	General Purpose Lane/ Facility Type (project to achieve LOS - Ultimate concept)	Base Year (BY) 2014	No Build Horizon Year (HY) 2035	Build (HY)	Ultimate Concept	(BY) 2014	No Build (HY) 2035	Build (HY)
1	YOL	0.000	2.680	6	F	2.68	16.08	-	6	F	2.68	16.08	-	6F	E	F	F	D	122,000	145,000	150,000
2	YOL	2.68	9.55	6	F	6.870	41.22	-	6	F	6.870	41.22	-	6F	F	F	F	E	149,000	177,000	189,000
3	YOL	9.55	R11.718	6	F	2.168	11.72	-	6	F	2.170	11.72	-	6F	C	D	D	E	86,000	108,000	109,000

A review of similar information for I-80 in Solano County (e.g., (I-80 East Corridor System Management Plan District 4, [Caltrans 2017]) revealed evidence that slow freeway speeds (i.e., LOS F conditions) occur near the Yolo/Solano County line in the eastbound direction during the evening peak period.

The combination of SACOG and MTC region growth, including that associated with the proposed ARC project, would exacerbate the current I-80 performance problems related to slow speeds and unreliable travel times described above. In response, Caltrans, in cooperation with SACOG, developed the carpool lane project on I-80 between Davis and Downtown Sacramento, which is included in the SACOG MTP/SCS as shown below (SACOG 2016). This project would extend between Richards Boulevard in Davis to the I-5/US 50 interchange in Sacramento.

Project ID	Included in DPS	COUNTY	LEAD AGENC	TITLE	PROJECT DESCRIPTION	Completion Timing	TOTAL COST (2015 Dollars)	Status
CAL18812	Yes	Multiple Counties	Caltrans D3	I-80 / U.S. 50 Bus/Carpool Lanes in both directions	Bus/Carpool Lanes in both directions from Richards Blvd. (in Davis) to the I-5/US 50 Interchange. Inc. new bike bridge across the Yolo Causeway.	2021-2036	$300,000,000	Planned

In addition, as shown below, the SACOG MTP/SCS includes expansion of the Capitol Corridor service from two round trips to ten round trips between Sacramento and Roseville. This expansion would improve the viability of using transit for longer distance trips to/from Davis that would otherwise be using I-80.

Project ID	Included in DPS	COUNTY	LEAD AGENCY	TITLE	PROJECT DESCRIPTION	Completion Timing	TOTAL COST (2015 Dollars)	Status
CAL18320	Yes	Multiple Counties	Capitol Corridor JPA	Sacramento to Roseville Third Main Track - Phase 1	On the Union Pacific mainline, from near the Sacramento and Placer County boarder to the Roseville Station area in Placer County: Construct a layover facility, install various Union Pacific Railroad Yard track improvements, required signaling, and construct the most northern eight miles of third mainline track between Sacramento and Roseville (largely all in Placer County), which will allow up to two additional round trips (for a total of three round trips) between Sacramento and Roseville.	2021	$82,980,000	Programmed
VAR56199	Yes	Multiple Counties	Capitol Corridor JPA	Sacramento to Roseville Third Main Track - Phase 2	On the UP mainline, from Sacramento Valley Station approximately 9.8 miles toward the Placer County line: Construct third mainline track including all bridges and required signaling. Project improvements will permit service capacity increases for Capitol Corridor in Placer County, with up to seven additional round trips added to Phase 1-CAL18320 (for a total of ten round trips) between Sacramento to Roseville including track and station improvements.	2021	$167,820,000	Programmed

The Capitol Corridor projects are already programmed according to the SACOG MTP/SCS and the carpool lane project is projected to have sufficient funding for implementation by 2036. These projects are not expected to eliminate the LOS F conditions on I-80 in the study area but will reduce the severity of congestion and provide more reliable travel options for those opting to carpool or use Capitol Corridor service.

A review of similar information for I-80 in Solano County (e.g., (I-80 East Corridor System Management Plan District 4 [Caltrans 2017]) revealed evidence that slow freeway speeds (i.e., LOS F conditions) near the Yolo/Solano County line in the eastbound direction during the evening peak period will continue to occur under 2030 conditions.

Caltrans analysis of this location contained in the I-80 East Corridor System Management Plan District 4, Caltrans, June 2017, does not include specific improvements to address this problem location. The plan does include the planned expansion of I-80 between Dixon and Davis, as shown in the highlighted text in the graphic labeled "Solano County Table," which is a location that could experience an increase in traffic from the proposed ARC project.

SOLANO COUNTY TABLE

CO	RTE	Beg PM	End PM	Project Description/Location	Improv. Type	Project Cost (millions)*	T-2040 Status	RTP #	Facility Type	IRRS Status	Delivery Status	Compl. By (year)	Comments
SOL	080	25.30	28.40	Extend the EB HOV-2 lane from Alamo Dr. to I-505.	HWY	$19.2	na	na	F	HE	Planned	na	I-80 East CSMP
SOL	080	25.30	28.40	Extend the WB HOV-2 lane from Alamo Dr. to I-505.	HWY	$32.8	na	na	F	HE	Planned	na	I-80 East CSMP
SOL	080	26.50	27.00	Provide an EB auxiliary lane between Cliffside Dr. and Allison Dr. with a 2-lane off-ramp at Allison Dr.	HWY	$3.5	na	na	F	HE	Planned	na	I-80 East CSMP
SOL	080	28.40	28.40	I-80/I-505 I/C redesign to accommodate express lane and eliminate lane drop from WB I-80 at I505.	HWY	na	na	na	F	HE	Planned	na	Solano 2040 Additional
SOL	080	30.00	40.00	Provide a 4th EB general purpose lane extending from E. of Leisure Town Rd. to W. of Kidwell Rd. Potentially HOV/HOT lane.	HWY	$78.0	na	na	F	HE	Planned	na	I-80 East CSMP
SOL	080	30.00	40.00	Provide a 4th WB general purpose lane between W. of Kidwell Rd. and E. of Leisure Town Rd. Potentially HOV/HOT lane.	HWY	$132.3	na	na	F	HE	Planned	na	I-80 East CSMP
SOL	080	30.90	40.70	Widen I-80 from 6 to 8 lanes, from West of Meridian Rd. to West of Kidwell Road	HWY	$83.0	na	na	F	HE	Planned	na	
SOL	080	35.35	35.68	I-80/West A Street Interchange Improvements - Ramp and eventually bridge improvements to increase capacity.	HWY	$25.0	New Com	240248	F	HE		2022	MIS/ Corridor Study
SOL	080	39.74	39.98	I-80/Pedrick Road Interchange Improvements - Ramp and eventually bridge improvements to increase capacity. Roadway provides access to northeast area business park of Dixon	HWY	$25.0	New Com	240178	F	HE	Planned	2022	
SOL	080	R11.40	19.17	Install ITS gap between Red Top Road and Air Base Parkway. This will consist of CCTV cameras, Highway Advisory Radio and communications infrastructure.	HWY	$6.0	na	na	F	HE	Planned	na	I-80 East CSMP
SOL	080	R11.98	12.85	Provide WB braided ramp configurations as necessary between SR-12 West and I-680 to improve weave and merge maneuvers	HWY	$4.2	na	na	F	HE	Planned	na	I-80 East CSMP
SOL	080	R25.30	R28.34	Extend ITS in EB direction between Alamo Drive and I-505	HWY	$2.3	na	na	F	HE	Planned	na	I-80 East CSMP
SOL	080	R25.30	R28.34	Extend ITS in the WB direction between I-505 and Alamo Drive	HWY	$2.0	na	na	F	HE	Planned	na	I-80 East CSMP

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Despite this information, MTC did not include any capacity expansion projects for the I-80 corridor in eastern Solano County as part of Plan Bay Area 2040. As such, regional growth (including the ARC Project) would likely exacerbate the congested conditions previously identified by Caltrans.

Additional employee and residential growth with the ARC Project would generate new peak period vehicle trips that would contribute to existing and future LOS F conditions on the I-80 mainline. For example, approximately one-third of peak hours trips generated by the ARC Project are estimated to travel to/from the Sacramento vicinity on I-80 on the Yolo Causeway (east of Davis), equal to approximately 820 and 870 additional vehicle trips during the a.m. and p.m. peak hours, respectively, under Existing Plus Project conditions. According to the I-80 TCR, this segment of I-80 served 12,200 peak hour trips during the base year (2014). Therefore, the project would increase I-80 mainline volumes on the Yolo Causeway by more than five percent.

Potential Operational Enhancements

The following actions would lessen anticipated project-related effects on I-80 mainline operations:

- At the time of the issuance of the first certificate of occupancy and as a component of the ARC TDM program, the Master Owners' Association (MOA) for the Project should establish the baseline peak hour I-80 mainline vehicle trips by which to determine the project's change to peak hour I-80 vehicle trips. Baseline a.m. and p.m. peak hour vehicle trips on I-80 shall be calculated on the following segments:
    1. Between Pedrick Road and Kidwell Road
    2. Between Richards Boulevard and Mace Boulevard
    3. East of Chiles Road (i.e., the Yolo Causeway)

  During the annual TDM reporting, the MOA should determine the number of a.m. and p.m. peak hour project vehicle trips that utilize I-80 on the segments listed above. In instances where these figures exceed baseline levels by five percent or more, the MOA should institute TDM strategies to reduce project-related peak hour vehicle trips on I-80. The implementation of TDM strategies should reduce peak hour project vehicle trips on I-80 to an amount less than five percent of baseline levels, to the extent feasible.

  TDM strategies that would reduce peak hour vehicle trips on I-80 include strategies to reduce commute and business vehicle trips to and from ARC using I-80. If these TDM strategies are not sufficient to reduce peak hour trips to baseline levels, additional TDM measures or adjustments to existing measures should be implemented, as needed to reduce peak hour trips to an amount less than five percent of baseline levels.
- The MOA for the Project should contribute a proportional share to the local contribution portion of freeway improvement projects to construct carpool lanes on I-80 between Richards Boulevard and West Sacramento.

5. Cumulative Plus Project Conditions

The cumulative analysis assumes the same roadway system and intersection improvements as is currently present. This is because the City's Capital Improvement Program (CIP) does not include any specific improvements within the study area. Additionally, there are no plans to upgrade the I-80/Mace Boulevard interchange. A high-occupancy-vehicle (HOV) or carpool lane is planned to be added on the adjacent segment of I-80, which has been considered in the traffic forecasts. Consistent with standard practice, traffic signal timings were optimized due to changes in travel demand between current and cumulative conditions.

Table 9 displays intersection LOS and delay under cumulative conditions, without and with the project. Note that the analysis is focused only on the study intersections along the project frontage and near the I-80/Mace Boulevard interchange. Technical calculations are provided in the Appendix. This table indicates that many of the study intersections would operate at LOS F without the project. The addition of the project would cause LOS F conditions or worsen already projected LOS F conditions by five seconds or more at 11 study intersections.

Table 10 displays the 95th percentile freeway off-ramp queue at the I-80/Mace Boulevard interchange off-ramps under cumulative conditions, without and with the project. This table indicates that vehicle queues would spill back out of both off-ramps onto I-80 under cumulative no project conditions during the a.m. peak hour. The project would exacerbate these queue spillbacks during the a.m. peak hour and also cause the queue to spill back to the freeway during the p.m. peak hour.

Table 11 displays roadway segment LOS under cumulative conditions, without and with the project. All study roadway segments would operate acceptably under both Cumulative No Project and Cumulative Plus Project conditions except for Pole Line Road north of Covell Boulevard, which would operate at LOS F during the p.m. peak hour under both Cumulative No Project and Cumulative Plus Project conditions. The project would not cause an increase in p.m. peak hour volume by more than 10 percent, therefore, in accordance with the roadway segment performance thresholds, the project would not have a cumulatively considerable effect on this unacceptable condition.

Table 9: Peak Hour Intersection Operations – Cumulative Plus Project Conditions

Intersection	Traffic Control	Jurisdiction	Cumulative Conditions				Cumulative Plus Project Conditions			
			A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
9. Mace Blvd./ Alhambra Dr./ South ARC Driveway	Signal	City of Davis	100	F	242	F	**191**	**F**	**301**	**F**
10. Second Street/ Fermi Place/ Target Driveway	Signal	City of Davis	16	B	118	F	17	B	102	F
11. Mace Blvd./ Second Street/ CR 32A	Signal	City of Davis	110	F	115	F	**133**	**F**	**204**	**F**
12. CR 32A/Mace Park-and-Ride Driveway/West ARC Driveway	TWSC	Yolo County/City of Davis[1]	1 (4)	A (A)	2 (6)	A (A)	**19 (40)**	**A (E)**	**133 (674)**	**F (F)**
13. Mace Blvd./I-80 WB Ramps	Signal	Caltrans	168	F	100	F	145	F	**137**	**F**
14. Mace Blvd./ Chiles Road	Signal	City of Davis	97	F	146	F	**122**	**F**	125	F
15. Chiles Road/ I-80 EB Ramp	Signal	Caltrans	271	F	219	F	**359**	**F**	**275**	**F**
16. Mace Blvd./ Cowell Blvd.	Signal	City of Davis	62	E	200	F	**89**	**F**	190	F
17. Mace Blvd./ El Macero Drive	AWSC	City of Davis	27	D	299	F	44	E	**314**	**F**
21. Mace Blvd./ Central ARC Driveway	TWSC	City of Davis	-	-	-	-	**62 (107)**	**F (F)**	**61 (200)**	**F (F)**
22. Mace Blvd./ CR 30B/North ARC Driveway	TWSC	Yolo County	-	-	-	-	**151 (249)**	**F (F)**	**144 (769)**	**F (F)**
23. CR 32A/East ARC Driveway	TWSC	Yolo County/City of Davis[1]	-	-	-	-	3 (10)	A (A)	**97 (285)**	**F (F)**

Notes: For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For two-way stop-controlled intersections, average intersection delay is reported in seconds per vehicle for all approaches with the delay and LOS for the worst-case movement reported in parentheses.

Results provided only for intersections analyzed using micro-simulation.
Shaded cells indicate locations with unacceptable peak hour LOS.
Shaded and bold cells indicate locations where the project would cause adverse effects to peak hour intersection operations in accordance with the performance criteria.
TWSC = Two-Way Stop Control. AWSC = All-Way Stop Control. "-" = Does not exist.
[1] The segment of CR 32A along the ARC site southern frontage would be annexed into the City of Davis along with the project site. Thus, City of Davis performance criteria related to roadway performance would apply to study intersections #12 and #23 under Cumulative Plus Project conditions.

Source: Fehr & Peers, 2020.

Table 10: Freeway Off-Ramp Queuing – Cumulative Plus Project Conditions

Off-Ramp	Off-Ramp Distance[1]	95th Percentile Queue Length[2]			
		Cumulative Conditions		Cumulative Plus Project Conditions[3]	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
Mace Boulevard/I-80 WB Off-Ramp	1,200 feet	2,600 feet[4]	450 feet	2,600 feet[4]	2,600 feet[4]
Chiles Road/I-80 EB Off-Ramp	1,100 feet	2,175 feet	1,050 feet	3,050 feet	2,375 feet

Notes: [1] Measured from the intersection stop bar to the gore point of the freeway off-ramp. Does not include auxiliary lane on freeway mainline.
[2] Results at the Mace Boulevard/Chiles Road interchange are based on results from SimTraffic micro-simulation model.
[3] Shaded cells represent conditions in which the queue would spill onto the freeway mainline.
[4] Results are identical for these scenarios and time periods because queue spills out of model network.

Source: Fehr & Peers, 2020.

Table 11: Peak Hour Roadway Segment Operations – Cumulative Conditions

Study Roadway Segment	Functional Classification (# of Lanes)	Jurisdiction	Cumulative Conditions				Cumulative Plus Project Conditions			
			A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
			Two-Way Volume	LOS	Two-Way Volume	LOS	Two-Way Volume	LOS	Two-way Volume	LOS
1. East Covell Boulevard: west of Pole Line Road	Arterial (4)	City of Davis	1,710	C	2,200	D	1,990	C	2,570	D
2. East Covell Boulevard: east of Pole Line Road	Arterial (4)	City of Davis	1,460	C	1,740	C	1,890	C	2,270	D
3. Pole Line Road: north of East Covell Boulevard	Arterial (2)	City of Davis	1,460	E	1,730	F	1,610	E	1,890	F
4. Pole Line Road: south of East Covell Boulevard	Arterial (2)	City of Davis	1,090	D	1,270	D	1,090	D	1,270	D
5. East Covell Boulevard: west of Alhambra Drive	Arterial (4)	City of Davis	1,490	C	1,710	C	1,950	C	2,290	D
6. East Covell Boulevard: east of Harper Junior High School	Arterial (4)	City of Davis	1,460	C	1,430	C	1,750	C	1,940	C
7. Alhambra Drive: south of East Covell Boulevard	Arterial (2)	City of Davis	350	C	350	C	540	C	420	C
8. Alhambra Drive: west of Mace Boulevard	Arterial (2)	City of Davis	830	C	910	C	1,150	D	1,180	D
9. Second Street: west of the Fermi Place	Arterial (2)	City of Davis	1,080	D	1,280	D	1,190	D	1,410	D
10. CR 32A: east of project site	Highway (2)	Yolo County	170	C	320	C	500	D	900	D

11. Chiles Road: west of I-80 EB Off-Ramp	Arterial (2)	City of Davis	1,120	D	1,000	D	1,230	D	1,250	D
12. Chiles Road: east of Mace Boulevard	Arterial (2)	City of Davis	1,070	D	1,390	D	1,100	D	1,440	D
13. Cowell Boulevard: west of Mace Boulevard	Arterial (2)	City of Davis	480	C	680	C	500	C	700	C
14. Mace Boulevard: south of El Macero Drive	Arterial (2)	City of Davis	490	C	590	C	500	C	610	C

Notes: Shaded cells indicate locations with unacceptable peak hour LOS.
Shaded and bold cells indicate locations where the project would cause adverse effects to peak hour roadway segment operations in accordance with the performance criteria.
Source: Fehr & Peers, 2020.

Potential Operational Enhancements

The potential operational enhancements illustrated on Figure 2 were tested under cumulative plus project conditions. **Table 12** displays the resulting intersection LOS and delay under cumulative plus project conditions with these operational enhancements in place. **Table 13** summarizes how the percentage of peak hour travel demand is able to be served within the portion of the study area covered by the micro-simulation model. **Table 14** summarizes illustrates how the operational enhancements would affect freeway off-ramp queues at the I-80/Mace Boulevard interchange.

The results in these tables reveal several important conclusions:

- Background traffic growth will require improvements within this portion of the study area regardless of whether the project is developed.
- The project would further worsen operations in this area, though the operational enhancements would provide some benefit. For instance, in the p.m. peak hour, the percent demand served under cumulative plus project conditions would increase from 65 percent to 83 percent with the enhancements. However, the operational enhancements are not sufficient, in and of themselves, to improve conditions to LOS E or better.

Table 12: Peak Hour Intersection Operations – Cumulative Plus Project Conditions with Potential Operational Enhancements

Intersection	Traffic Control	Jurisdiction	Cumulative Conditions				Cumulative Plus Project Conditions				Cumulative Plus Project Conditions with Potential Operational Enhancements			
			A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
9. Mace Blvd./ Alhambra Dr./ South ARC Driveway	Signal	City of Davis	100	F	242	F	**191**	**F**	**301**	**F**	**136**	**F**	**266**	**F**
10. Second Street/ Fermi Place/ Target Driveway	Signal	City of Davis	16	B	118	F	17	B	102	F	16	B	33	C
11. Mace Blvd./ Second Street/ CR 32A	Signal	City of Davis	110	F	115	F	**133**	**F**	**204**	**F**	97	F	117	F
12. CR 32A/Mace Park-and-Ride Driveway/West ARC Driveway	TWSC/ Signal	Yolo County/City of Davis[1]	1 (4)	A (A)	2 (6)	A (A)	**19 (40)**	**A (E)**	**133 (674)**	**F (F)**	12	B	96	F
13. Mace Blvd./I-80 WB Ramps	Signal	Caltrans	168	F	100	F	145	F	**137**	**F**	144	F	**114**	**F**
14. Mace Blvd./ Chiles Road	Signal	City of Davis	97	F	146	F	**122**	**F**	125	F	**133**	**F**	57	E
15. Chiles Road/ I-80 EB Ramp	Signal	Caltrans	271	F	219	F	**359**	**F**	**275**	**F**	**303**	**F**	157	F
16. Mace Blvd./ Cowell Blvd.	Signal	City of Davis	62	E	200	F	**89**	**F**	190	F	**224**	**F**	109	F

17.	Mace Blvd./ El Macero Drive	AWSC	City of Davis	27	D	299	F	44	E	**314**	**F**	**334**	**F**	116	F
21.	Mace Blvd./ Central ARC Driveway	TWSC	City of Davis	-	-	-	-	**62 (107)**	**F (F)**	**61 (200)**	**F (F)**	**58 (93)**	**F (F)**	**54 (167)**	**F (F)**
22.	Mace Blvd./ CR 30B/North ARC Driveway	TWSC/ Signal	Yolo County	-	-	-	-	**151 (249)**	**F (F)**	**144 (769)**	**F (F)**	**136 (214)**	**F (F)**	**175 (764)**	**F (F)**
23.	CR 32A/East ARC Driveway	TWSC	Yolo County/City of Davis[1]	-	-	-	-	3 (10)	A (A)	**97 (285)**	**F (F)**	3 (9)	A (A)	**67 (263)**	**F (F)**

Notes: For signalized intersections, average intersection delay is reported in seconds per vehicle for all approaches. For two-way stop-controlled intersections, average intersection delay is reported in seconds per vehicle for all approaches with the delay and LOS for the worst-case movement reported in parentheses.
Results provided only for intersections analyzed using micro-simulation.
Shaded cells indicate locations with unacceptable peak hour LOS.
Shaded and bold cells indicate locations where the project would cause adverse effects to peak hour intersection operations in accordance with the performance criteria.
TWSC = Two-Way Stop Control. AWSC = All-Way Stop Control. "-" = Does not exist.
[1] The segment of CR 32A along the ARC site southern frontage would be annexed into the City of Davis along with the project site. Thus, City of Davis performance criteria related to roadway performance would apply to study intersections #12 and #23 under Cumulative Plus Project conditions.
Source: Fehr & Peers, 2020.

Table 13: Percent of Peak Hour Demand Served – Cumulative Plus Project Conditions with Potential Operational Enhancements

Location	Cumulative Conditions[1]				Cumulative Plus Project Conditions[1]				Cumulative Plus Project Conditions with Potential Operational Enhancements[1,2]			
	A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)	Hourly Demand	Vehicles Served (%)
Overall System[3]	18,350	15,964 (87%)	20,035	14,646 (73%)	24,289	17,051 (70%)	25,265	16,431 (65%)	24,289	17,823 (73%)	25,265	21,054 (83%)

Notes: [1] Based on results of SimTraffic micro-simulation model.
[2] Refer to Figure 2 for an illustration of potential operational enhancements.
[3] Includes study intersections 9 through 17.
Source: Fehr & Peers, 2020.

Table 14: Freeway Off-Ramp Queuing – Cumulative Plus Project Conditions with Potential Operational Enhancements

Off-Ramp	Off-Ramp Distance[1]	95th Percentile Queue Length[2]					
		Cumulative Conditions		Cumulative Plus Project Conditions[3]		Cumulative Plus Project Conditions with Potential Operational Enhancements[3]	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
Mace Boulevard/ I-80 WB Off-Ramp	1,200 feet	2,600 feet	450 feet	2,600 feet	2,600 feet	2,275 feet	2,600 feet
Chiles Road/I-80 EB Off-Ramp	1,100 feet	2,175 feet	1,050 feet	3,050 feet	2,375 feet	3,050 feet	500 feet

Notes: [1] Measured from the intersection stop bar to the gore point of the freeway off-ramp. Does not include auxiliary lane on freeway mainline.
[2] Results at the Mace Boulevard/Chiles Road interchange are based on results from SimTraffic micro-simulation model.
[3] Shaded cells represent conditions in which the queue would spill onto the freeway mainline.

Source: Fehr & Peers, 2020.

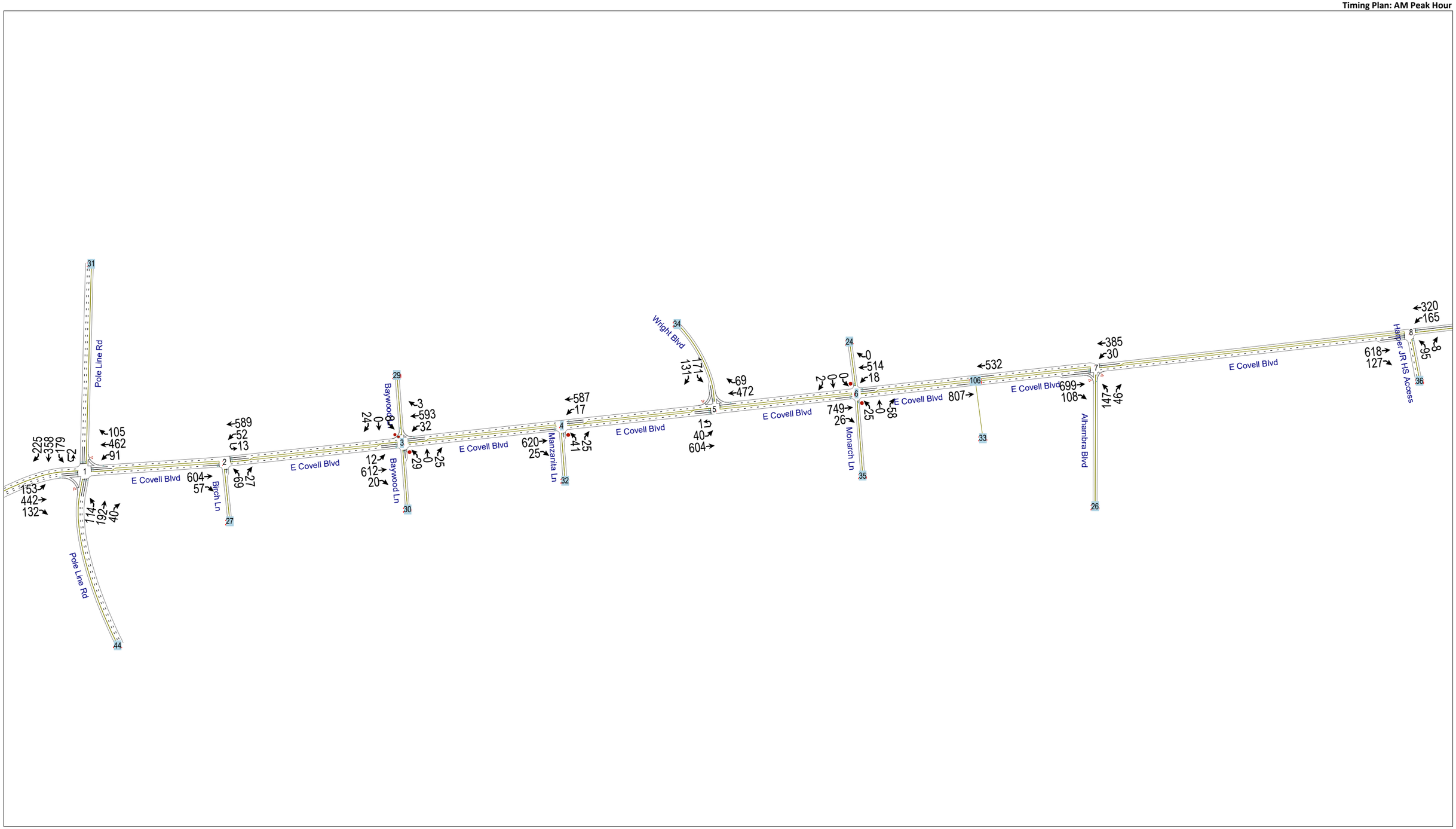
Aggie Research Campus

Technical Appendix

March 2020

RS19-3828.01

FEHR PEERS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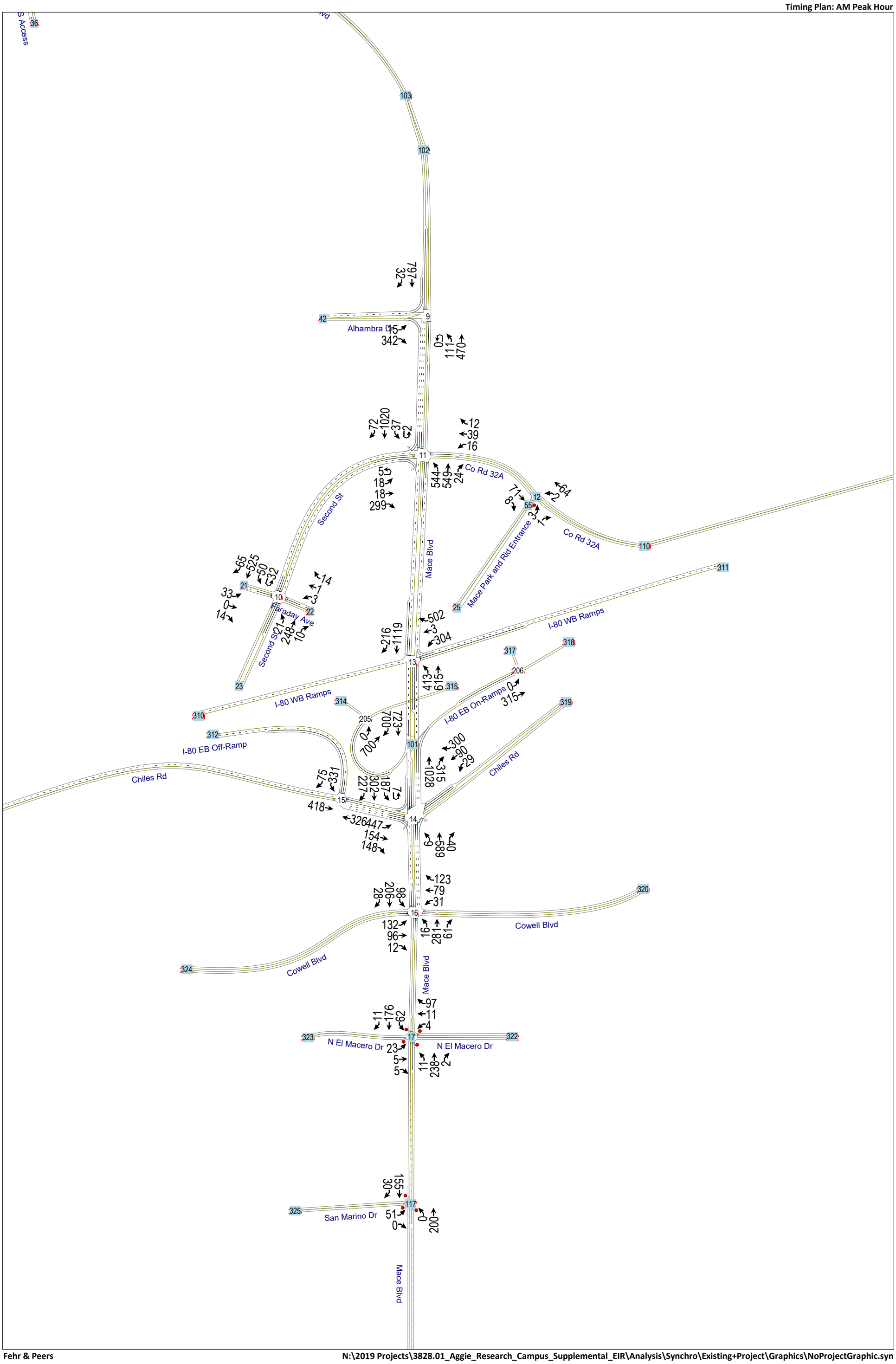
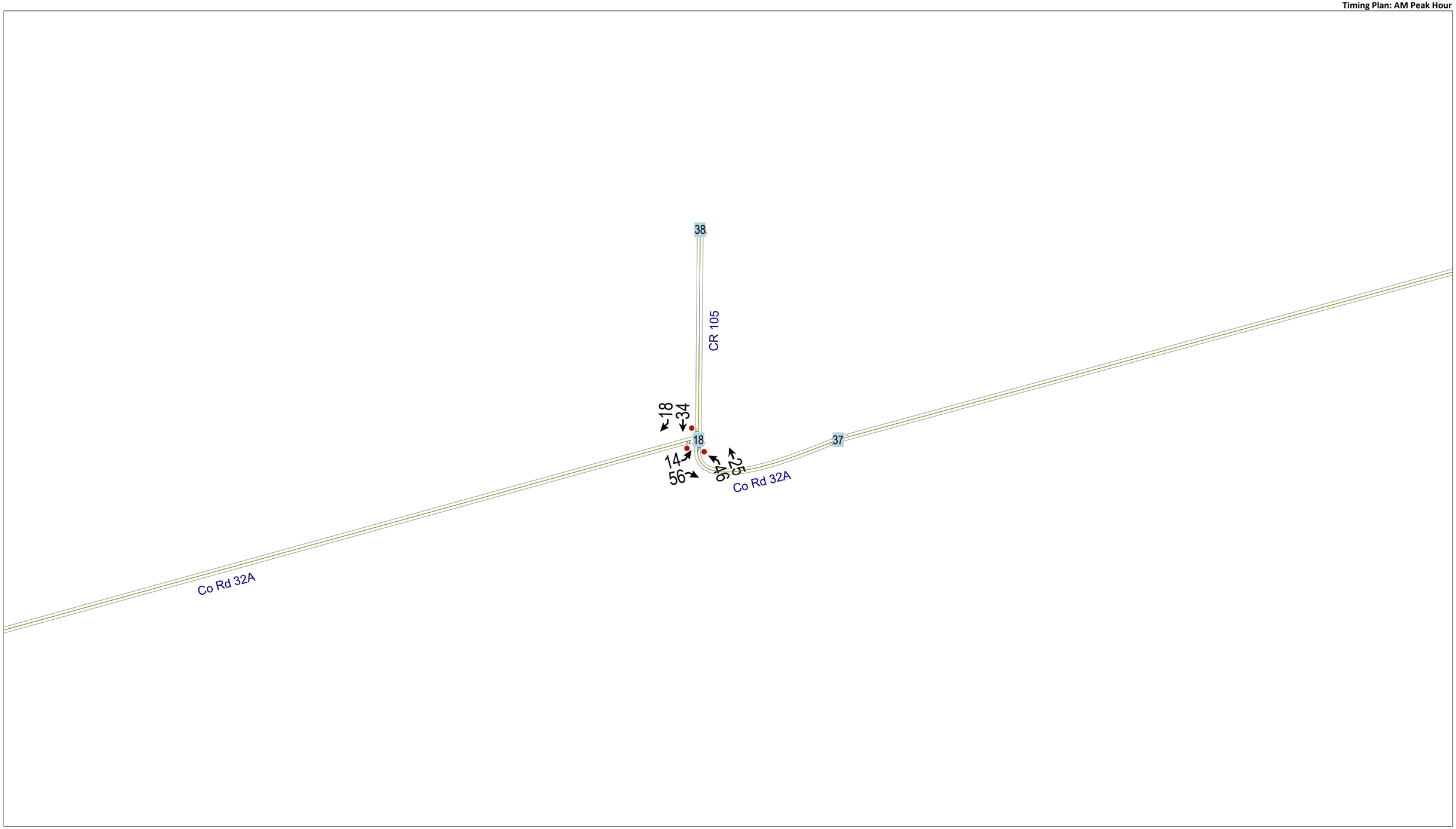

Alhambra Dr
Co Rd 32A
Second St
Mace Blvd
Mace Park and Rid Entrance
Co Rd 32A
I-80 WB Ramps
Faraday Ave
Second St
I-80 WB Ramps
I-80 EB On-Ramps
I-80 EB Off-Ramp
Chiles Rd
Chiles Rd
Cowell Blvd
Cowell Blvd
Mace Blvd
N El Macero Dr
N El Macero Dr
San Marino Dr
Mace Blvd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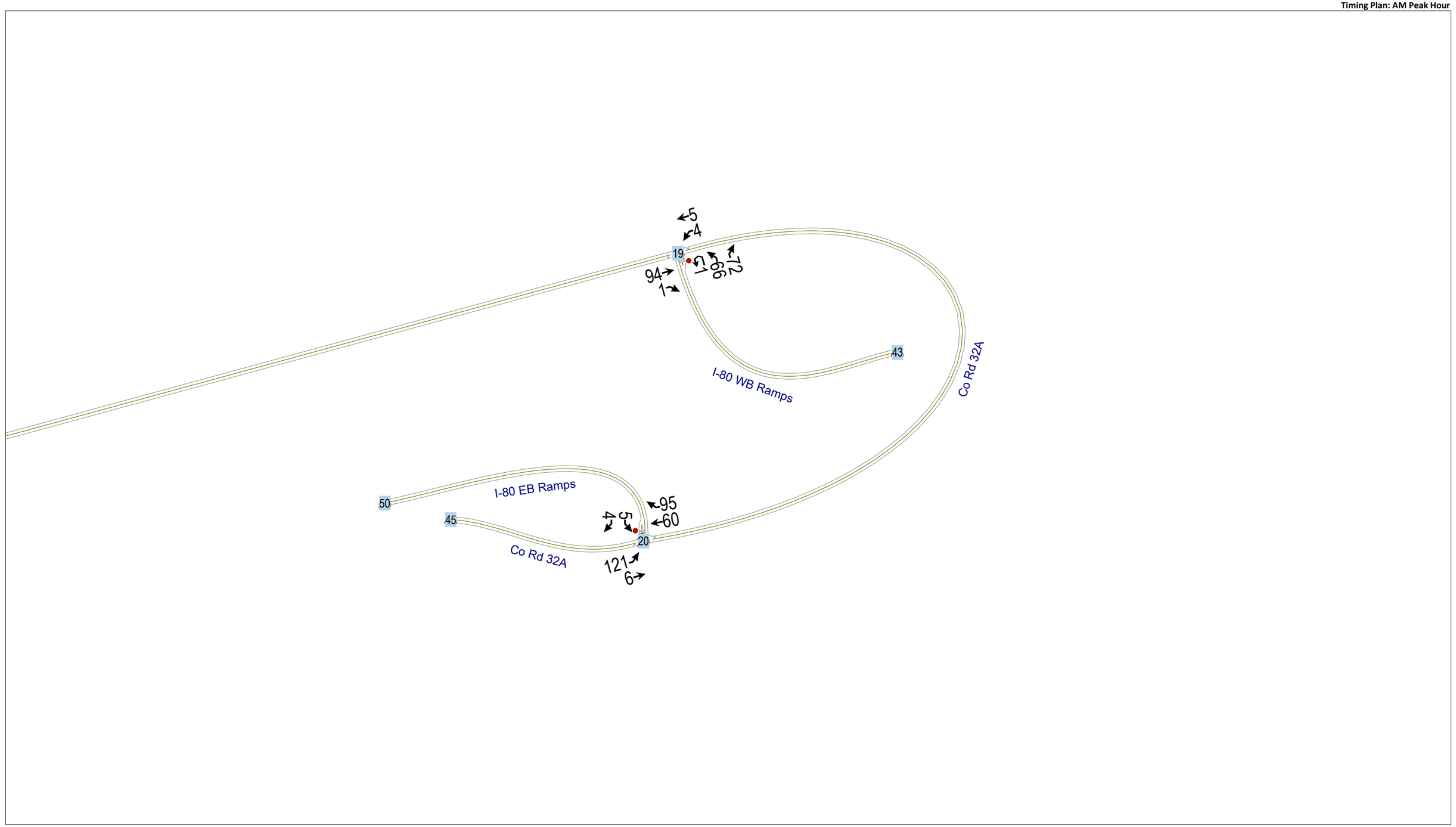
Co Rd 32A
Co Rd 32A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Co Rd 32A
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Co Rd 32A
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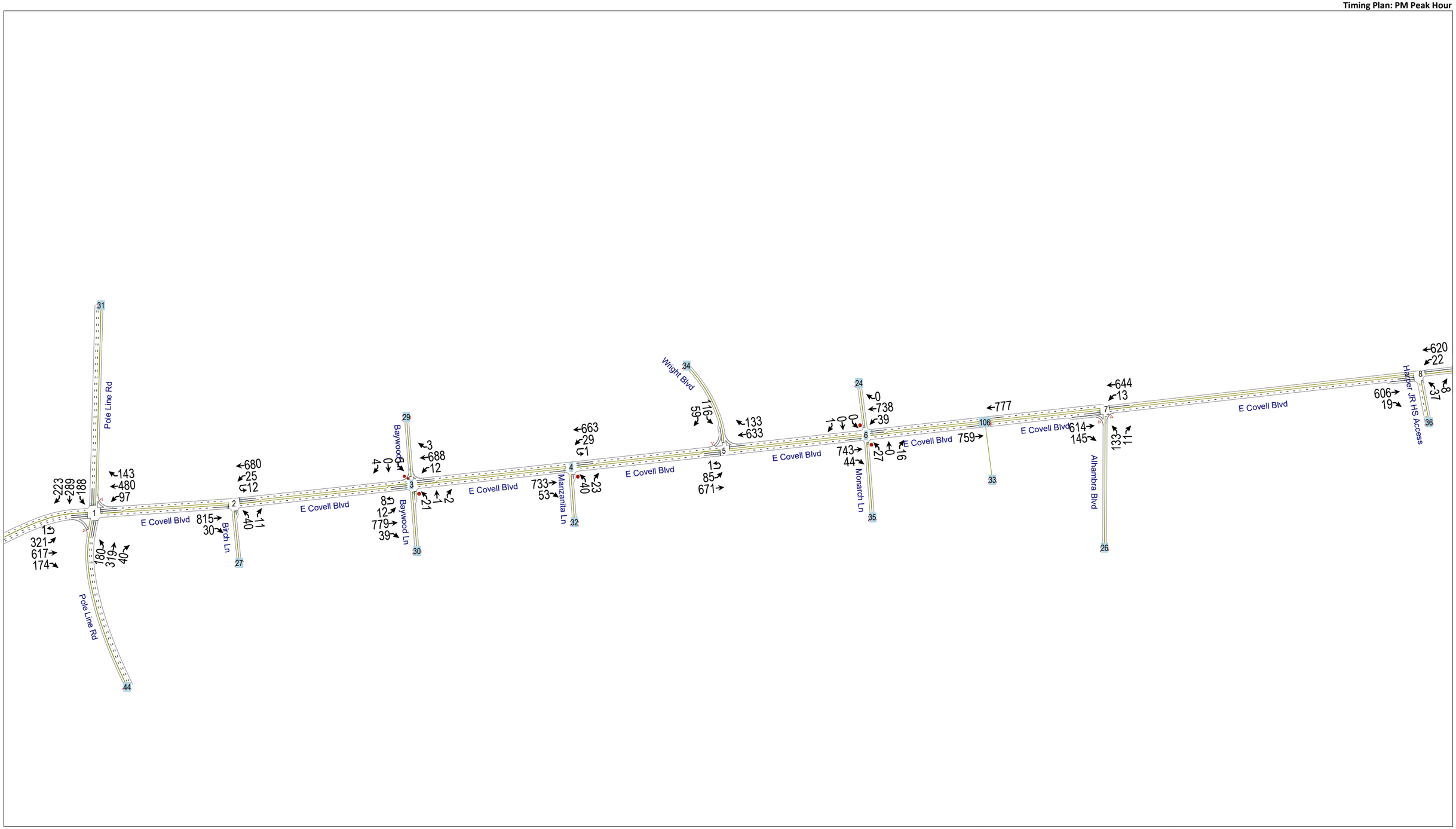
Pole Line Rd
E Covell Blvd
Wright Blvd
Baywood Ln
Birch Ln
Manzanita Ln
Monarch Ln
Alhambra Blvd
Harper JR HS Access
1 321 617 174
2 815 30
3 779 39 12 8
4 733 53
5 85 671 1
6 743 44
7 614 145
8 606 19
24 0 738 39
27 0 16
29 4 0 3 688 12
34 56 16
106 759
133 633
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180 379 40
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21 2
23 40
133 11
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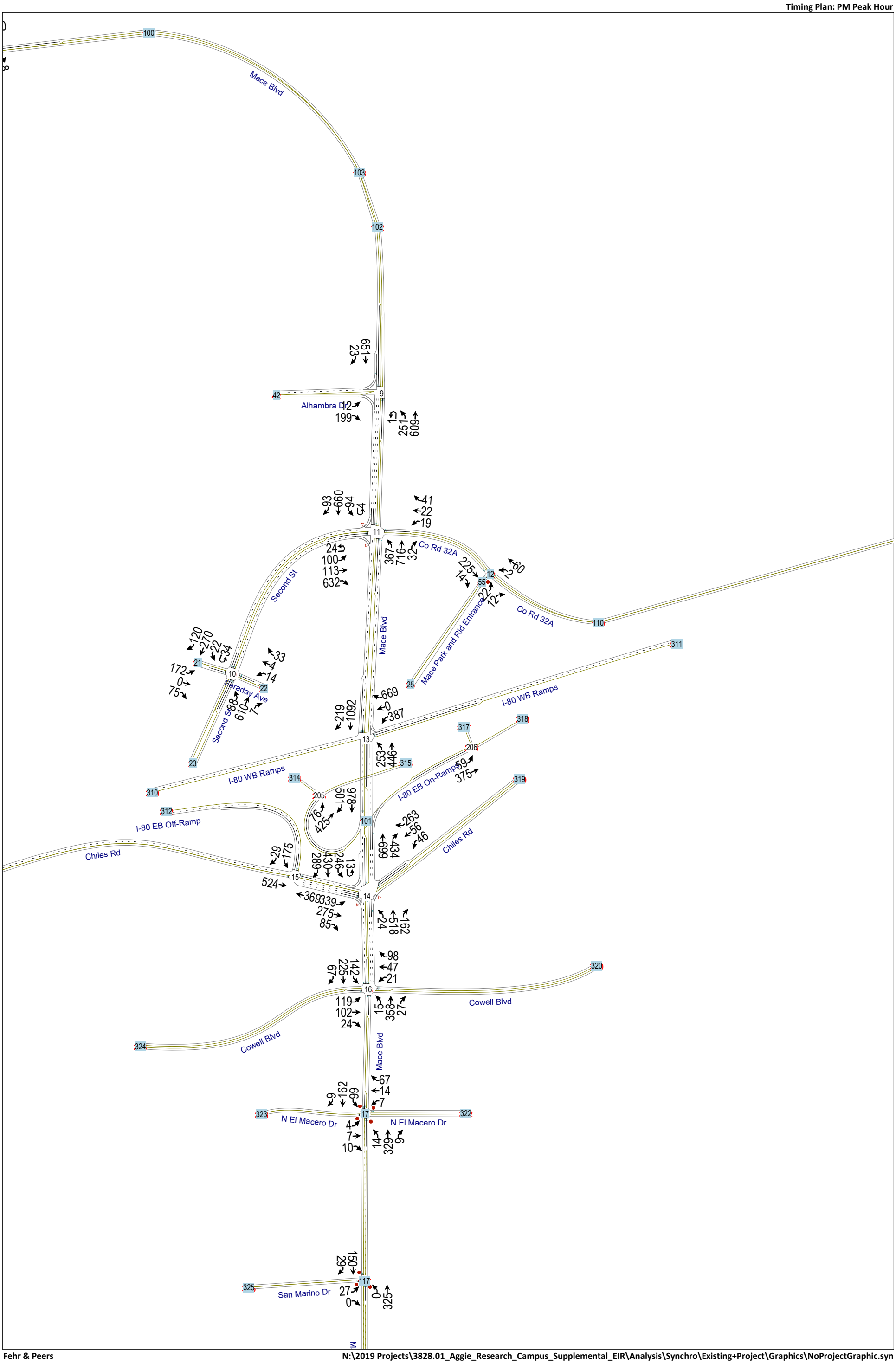
Mace Blvd
Alhambra Dr
Second St
Faraday Ave
Second St
Co Rd 32A
Co Rd 32A
Mace Park and Rid Entrance
Mace Blvd
I-80 WB Ramps
I-80 WB Ramps
I-80 EB On-Ramp
I-80 EB Off-Ramp
Chiles Rd
Chiles Rd
Cowell Blvd
Cowell Blvd
Mace Blvd
N El Macero Dr
N El Macero Dr
San Marino Dr
100
103
102
651
23
42
9
12
199
15
251
609
93
660
94
4
41
22
19
11
24
100
113
632
367
716
32
225
14
60
55
12
22
12
110
120
270
22
34
21
10
33
4
14
172
0
75
22
669
0
387
88
610
7
219
1092
13
311
25
317
318
206
59
375
253
446
315
23
314
205
310
312
501
978
76
425
101
263
56
46
699
434
319
29
175
289
430
246
13
524
15
369
339
275
85
14
24
518
162
98
47
21
67
14
7
9
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14
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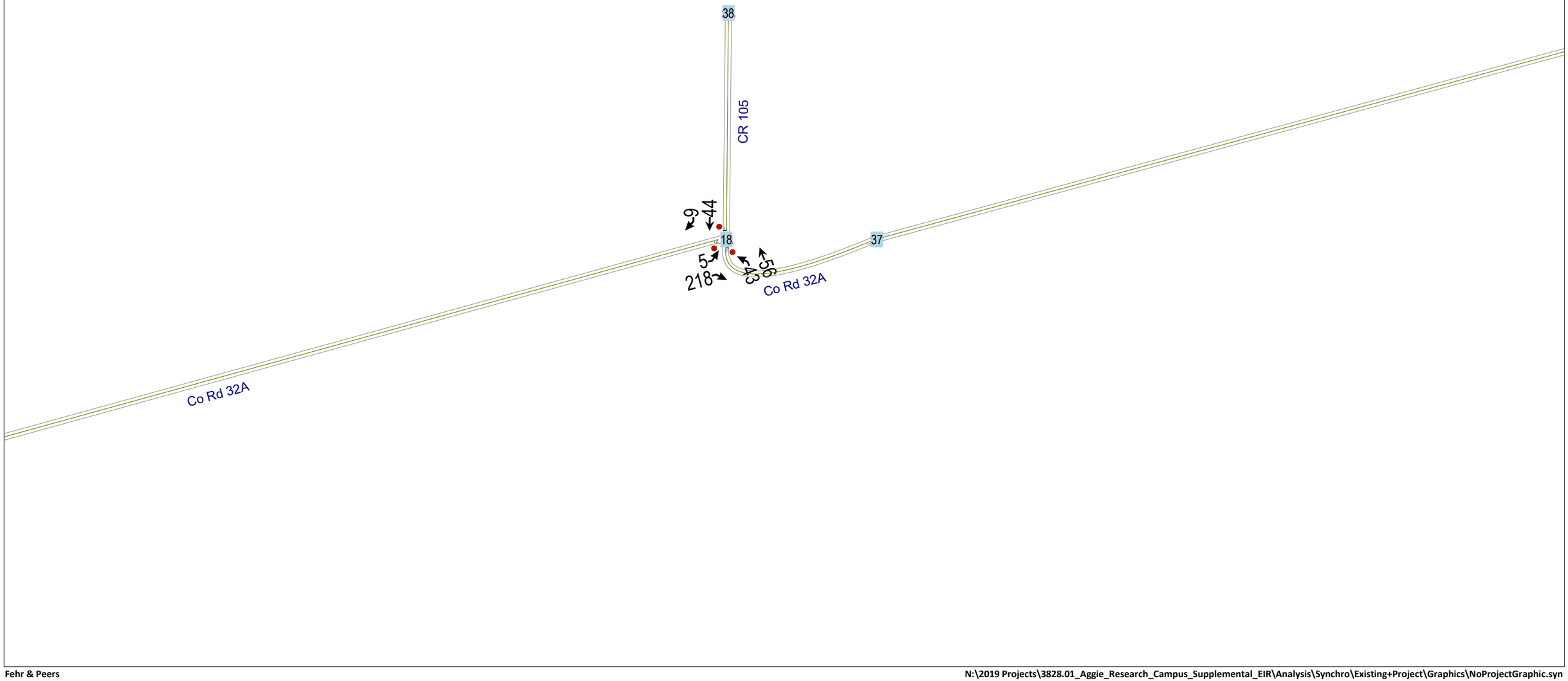
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CR 105
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44
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218
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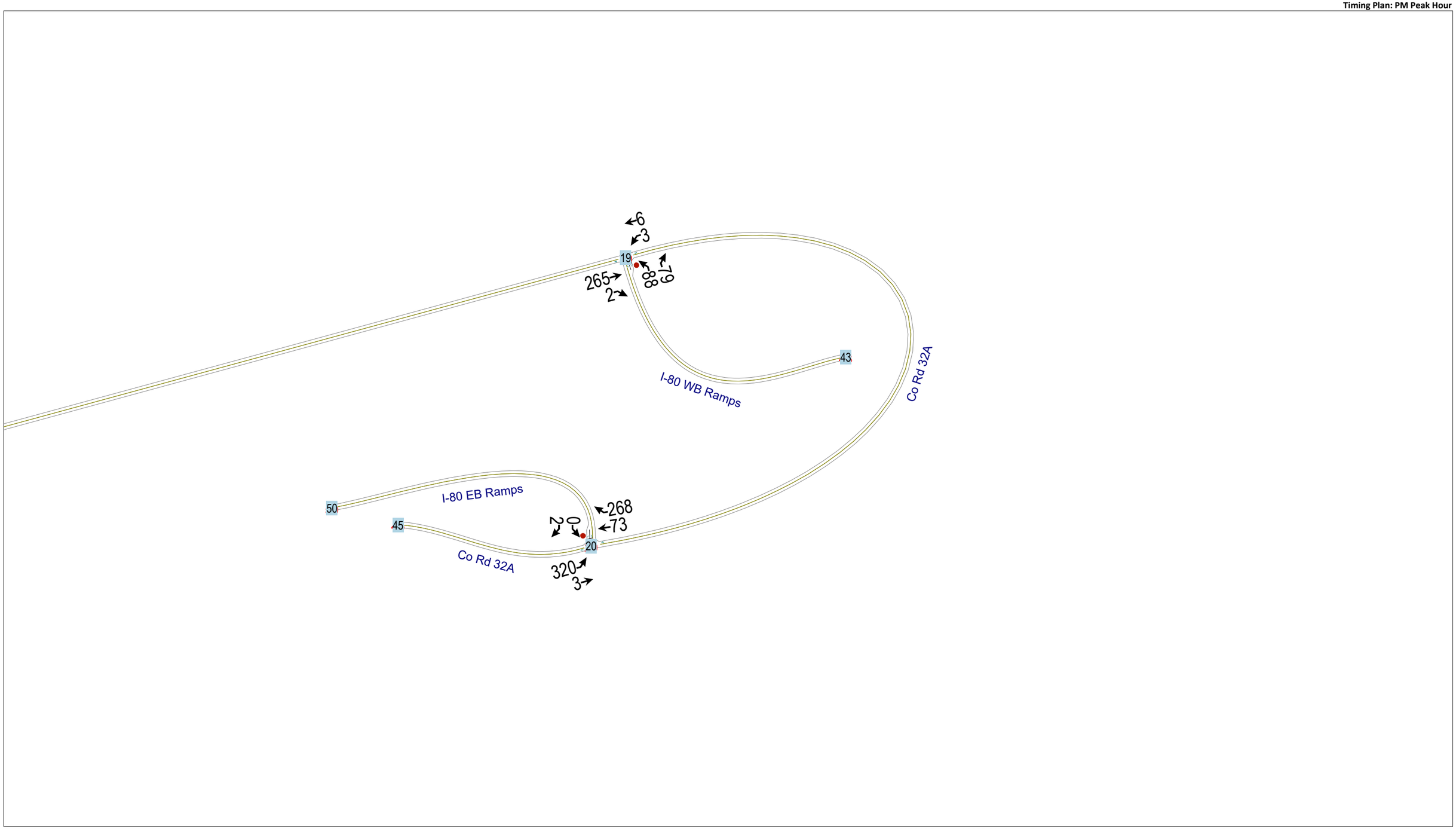
37
Co Rd 32A
Co Rd 32A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19
265
2
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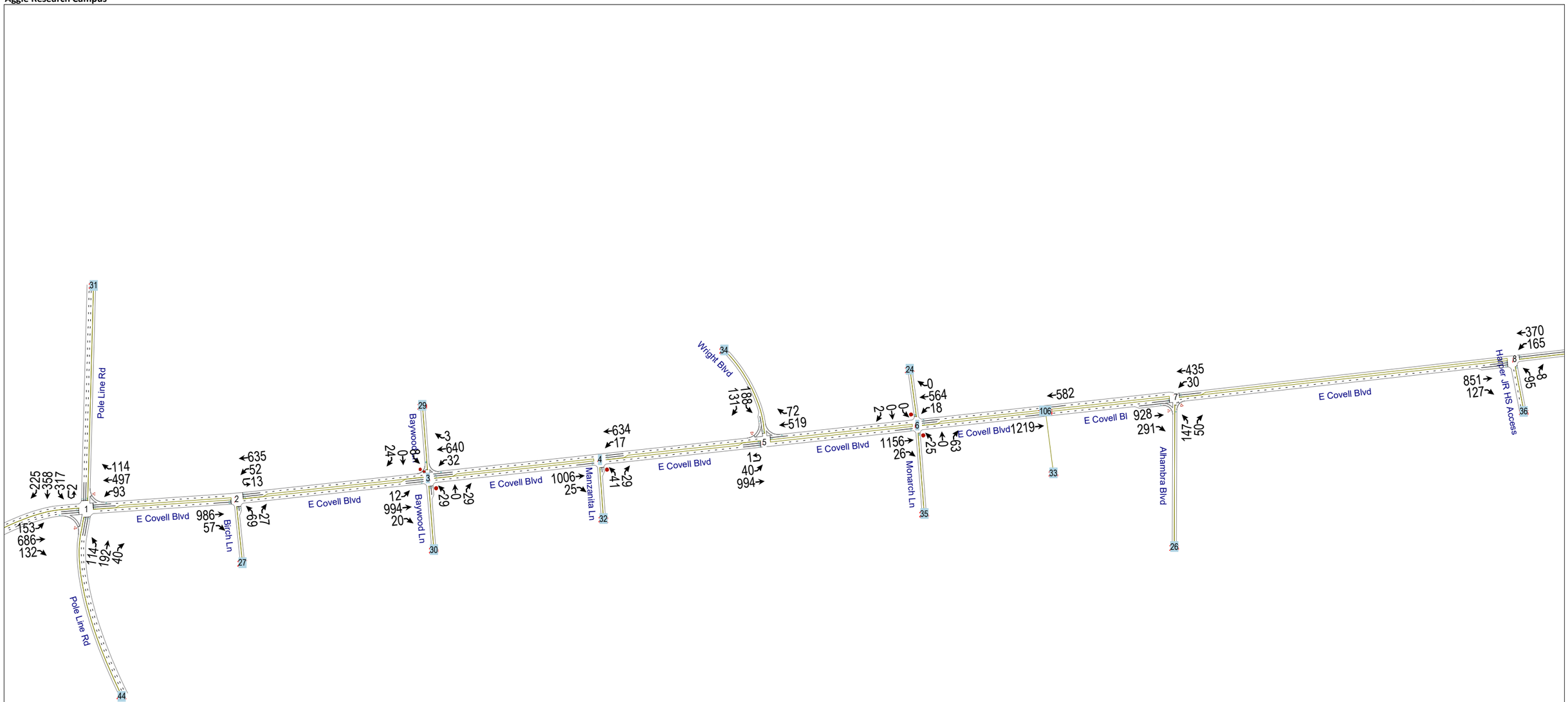
Co Rd 32A
50
I-80 EB Ramps
45
Co Rd 32A
268
73
70
20
320
3


Pole Line Rd
E Covell Blvd
Wright Blvd
Baywood Ln
Birch Ln
Manzanita Ln
Monarch Ln
Alhambra Blvd
Harper JR HS Access
31
29
34
24
8
1
2
3
4
5
6
7
44
27
30
32
35
26
33
36
106
153 686 132
225 358 317 52
114 497 93
114 192 46
986 57
635 52 13
66 27
12 994 20
24 0 8
3 640 32
29 0 29
1006 25
634 17
41 29
188 131
72 519
1 40 994
0 564 18
0 0 0
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25 0 63
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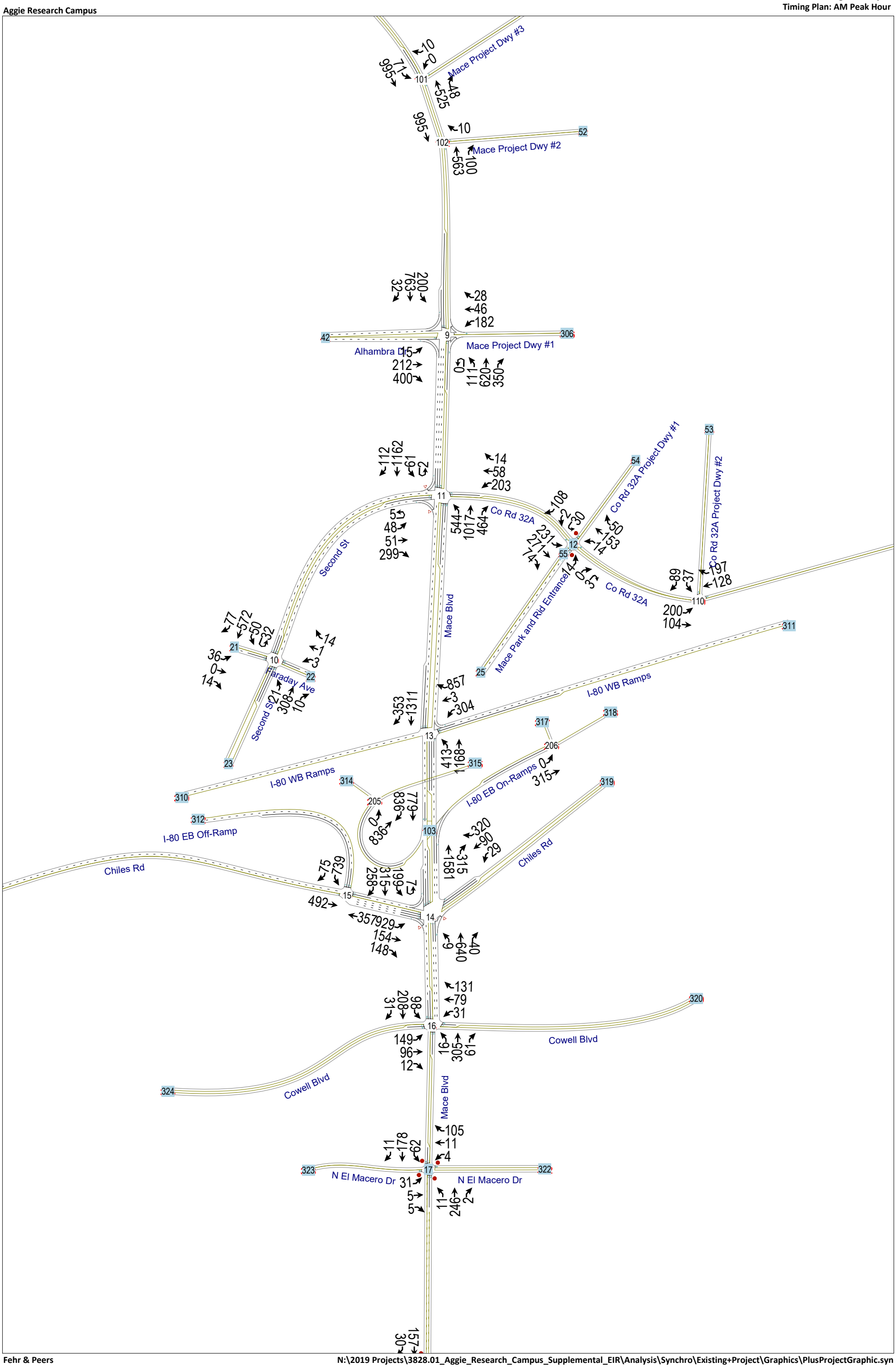
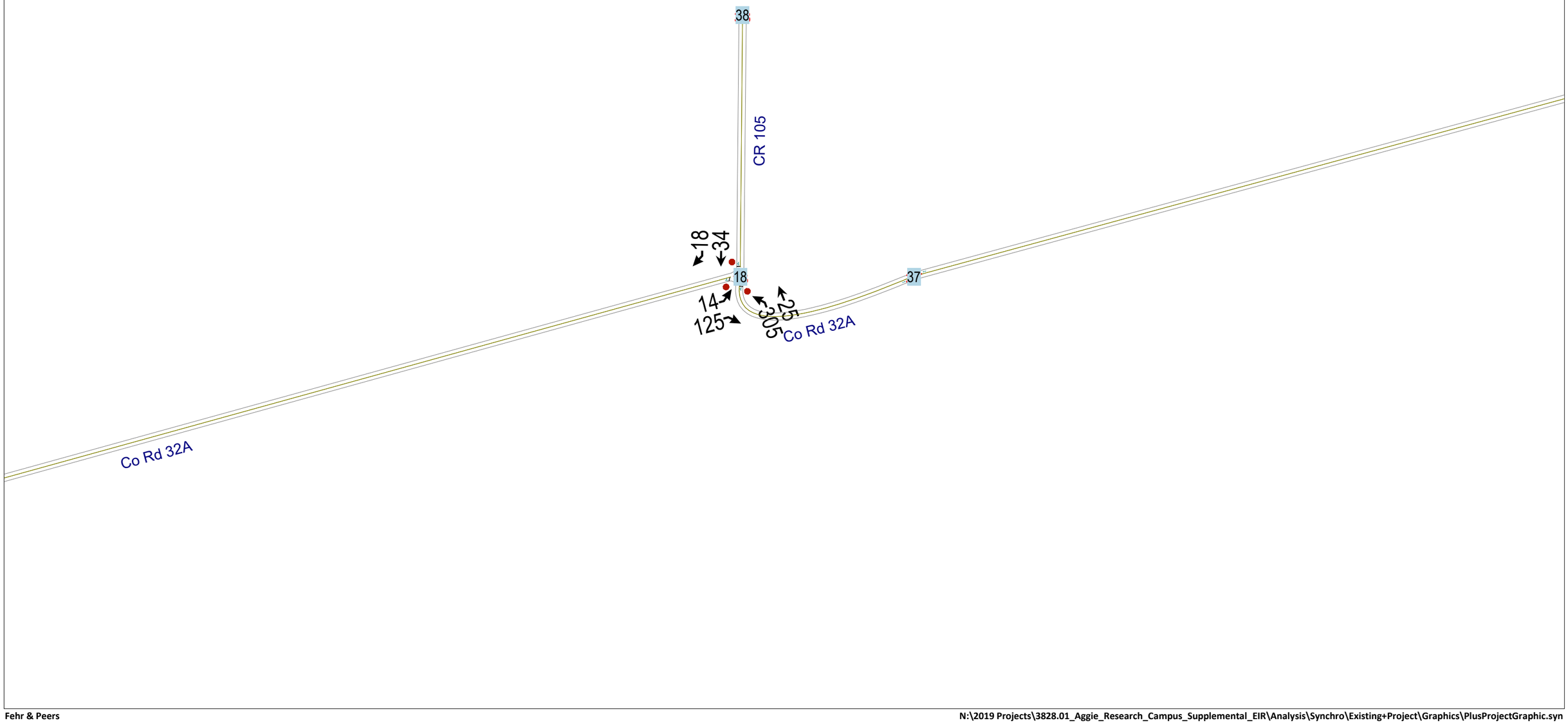
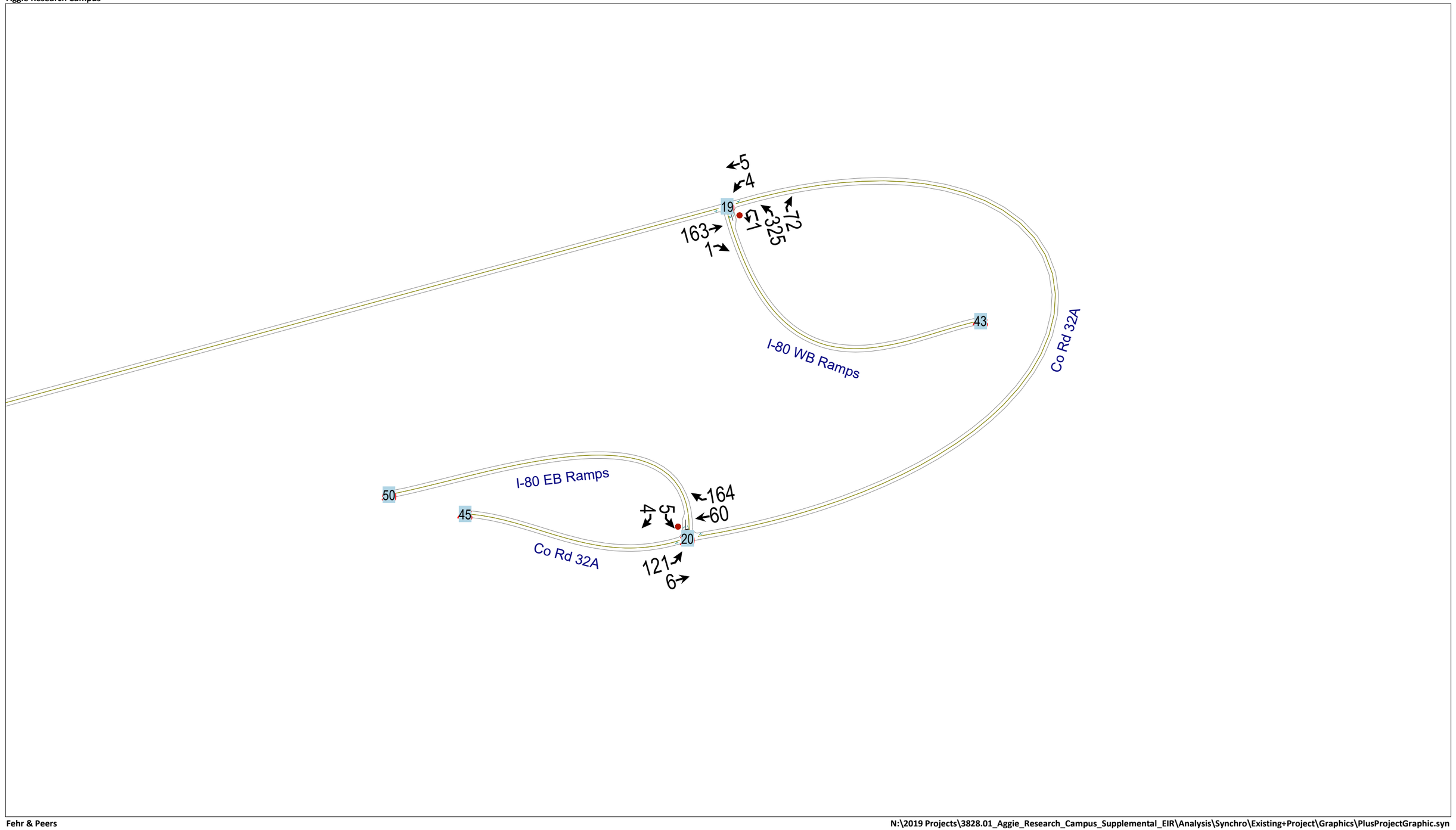
928 291
147 50
370 165
851 127
8 95


Mace Project Dwy #3
Mace Project Dwy #2
Mace Project Dwy #1
Alhambra Dr
Second St
Faraday Ave
Mace Blvd
Mace Park and Rid Entrance
Co Rd 32A
Co Rd 32A Project Dwy #1
Co Rd 32A Project Dwy #2
I-80 WB Ramps
I-80 EB On-Ramp
I-80 EB Off-Ramp
Chiles Rd
Cowell Blvd
N El Macero Dr


38
CR 105
18
34
18
14
125
37
125
305
Co Rd 32A
Co Rd 32A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4
19
163
1
72
325
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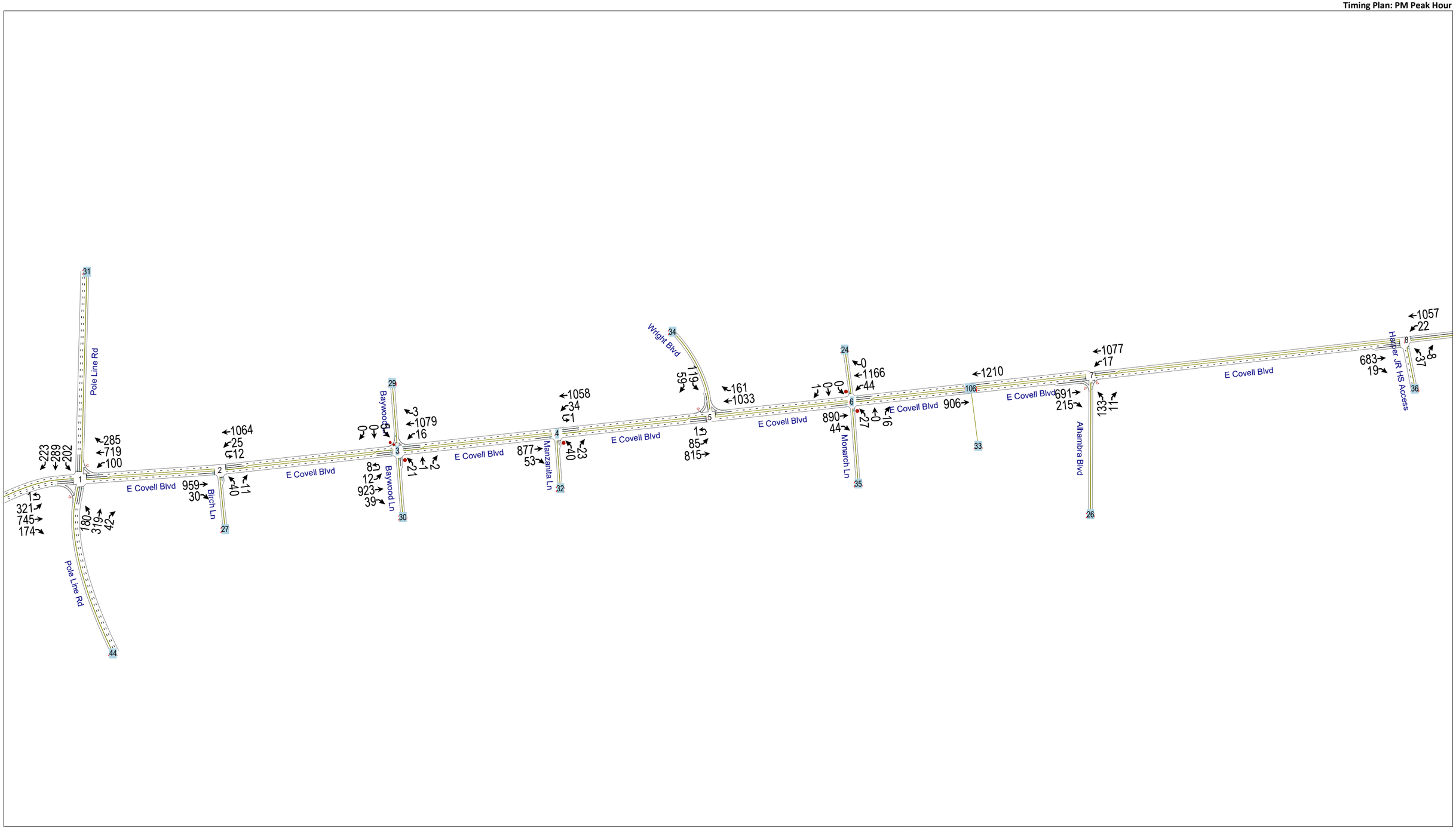
43
I-80 WB Ramps
Co Rd 32A
50
I-80 EB Ramps
45
164
60
4
5
20
Co Rd 32A
121
6


E Covell Blvd
Pole Line Rd
Wright Blvd
Baywood Ln
Birch Ln
Manzanita Ln
Monarch Ln
Alhambra Blvd
Harper JR HS Access
1
2
3
4
5
6
7
8
24
26
27
29
30
31
32
33
34
35
36
44
106
223 289 202
285 719 100
1064 25 12
959 30 40 11
1058 34 1
877 53 40 23
1033 161
1166 44
1210
1077 17
1057 22
683 19
8 37
906
890 44 27 0 16
691 215
133 11
1 321 745 174
180 319 42
1 85 815
3 1079 16
8 12 923 39
21 1 2
55 19
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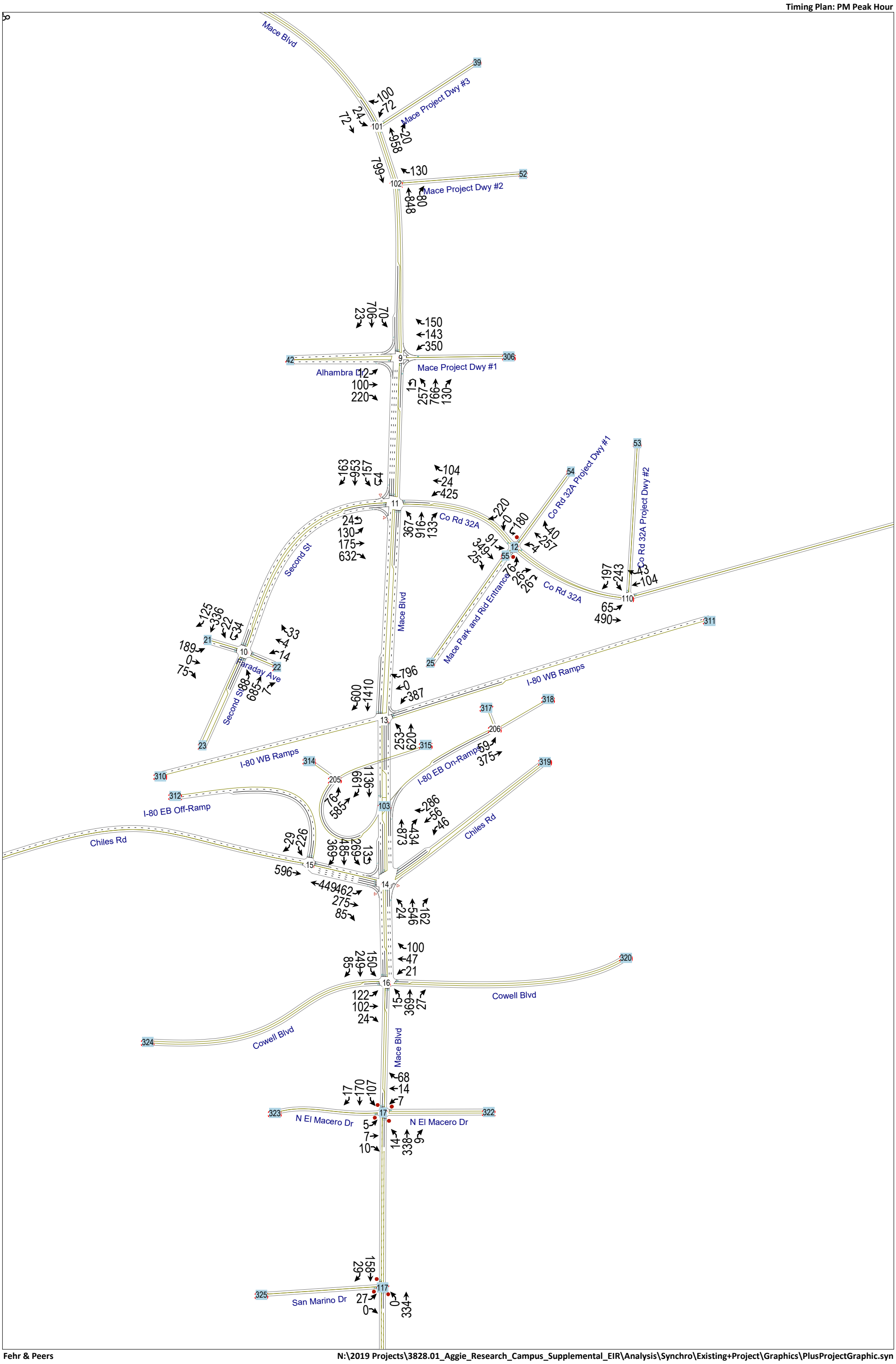
Mace Blvd
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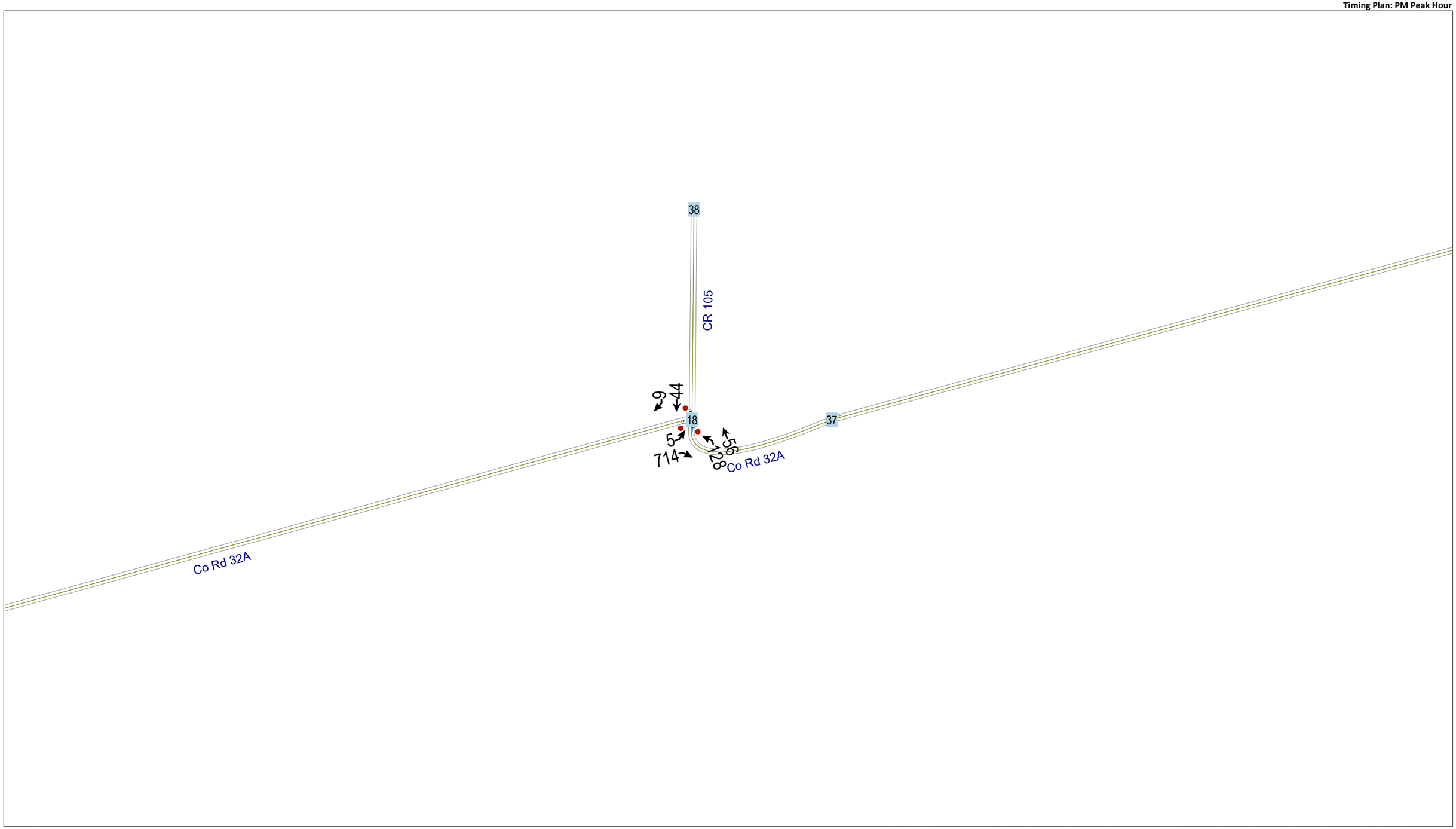
Mace Project Dwy #3
100
72
24
72
101
20
958
799
130
52
102
Mace Project Dwy #2
80
848
70
706
23
150
143
350
42
9
306
Alhambra Dr
Mace Project Dwy #1
12
100
220
1
257
766
130
163
953
157
4
104
24
425
11
Co Rd 32A
367
916
133
220
0
180
54
Co Rd 32A Project Dwy #1
53
Co Rd 32A Project Dwy #2
40
57
12
24
130
175
632
91
349
25
55
76
26
262
Co Rd 32A
197
243
43
104
110
65
490
Second St
Mace Blvd
Mace Park and Rid Entrance
125
336
22
34
33
4
14
189
0
75
21
10
22
Faraday Ave
Second St
88
685
7
796
0
387
600
1410
25
I-80 WB Ramps
311
13
317
206
318
253
620
315
59
375
I-80 WB Ramps
314
205
310
I-80 EB On-Ramp
319
111
136
661
76
585
312
103
I-80 EB Off-Ramp
286
56
46
434
873
Chiles Rd
Chiles Rd
29
226
369
485
269
135
15
596
14
449
462
275
85
24
546
162
100
47
21
98
249
150
16
320
122
102
24
15
369
27
Cowell Blvd
Cowell Blvd
324
Mace Blvd
68
14
7
17
170
107
323
N El Macero Dr
17
322
N El Macero Dr
5
7
10
14
338
9
29
158
325
San Marino Dr
117
27
0
0
334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CR 105
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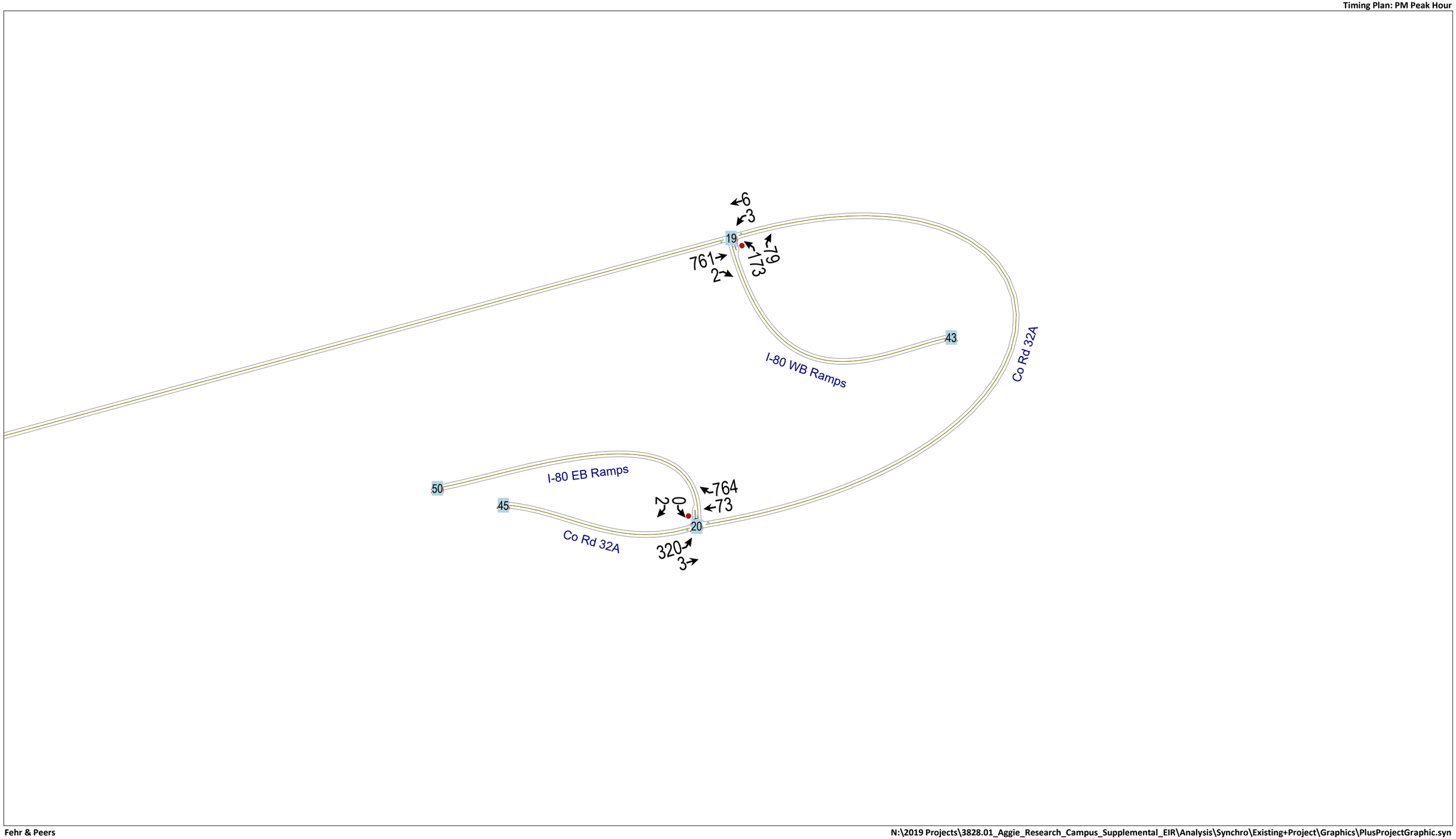
44
18
5
714
56
128
37
Co Rd 32A
Co Rd 32A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3
19
761
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I-80 WB Ramps
Co Rd 32A
50
I-80 EB Ramps
764
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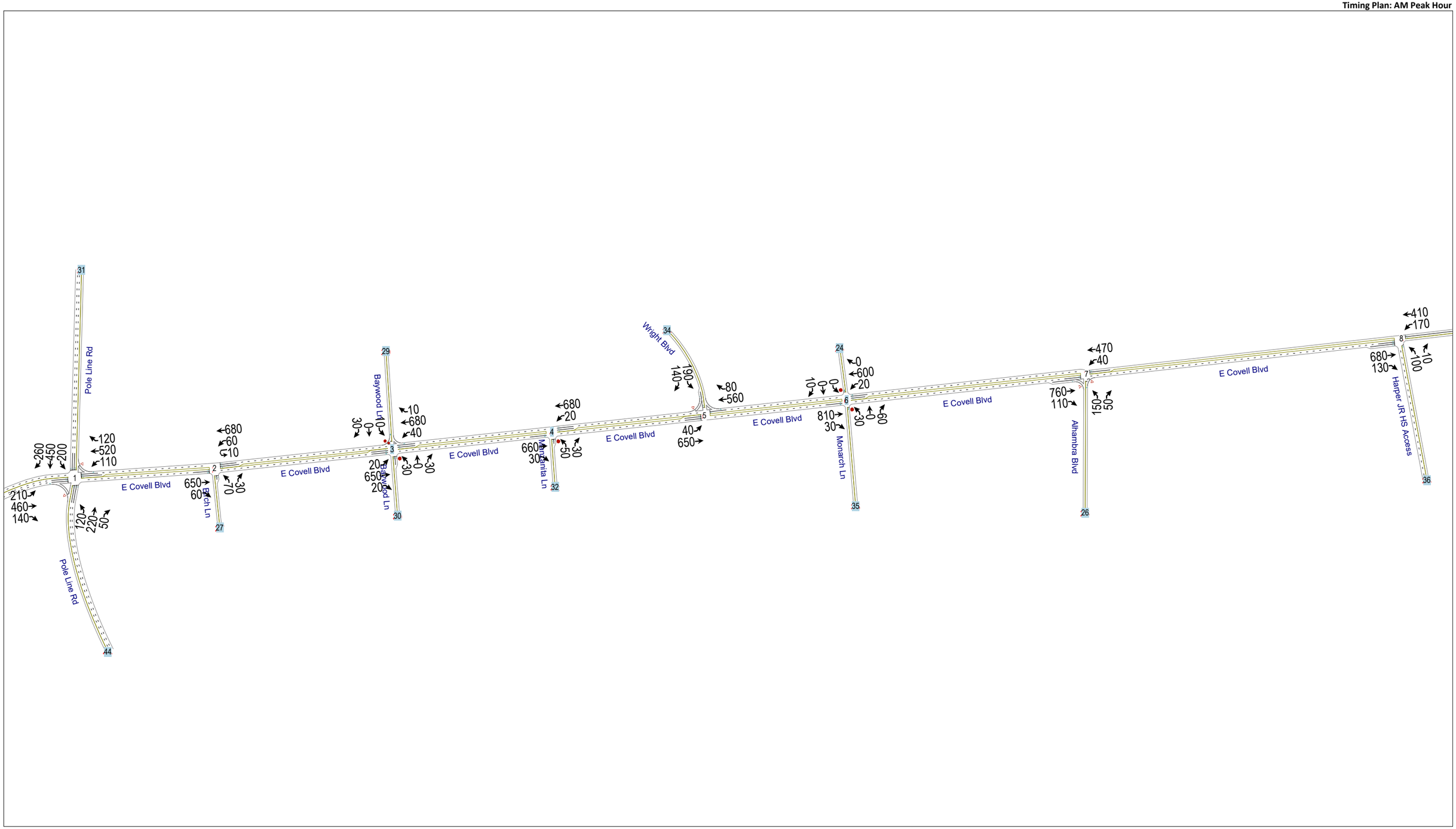
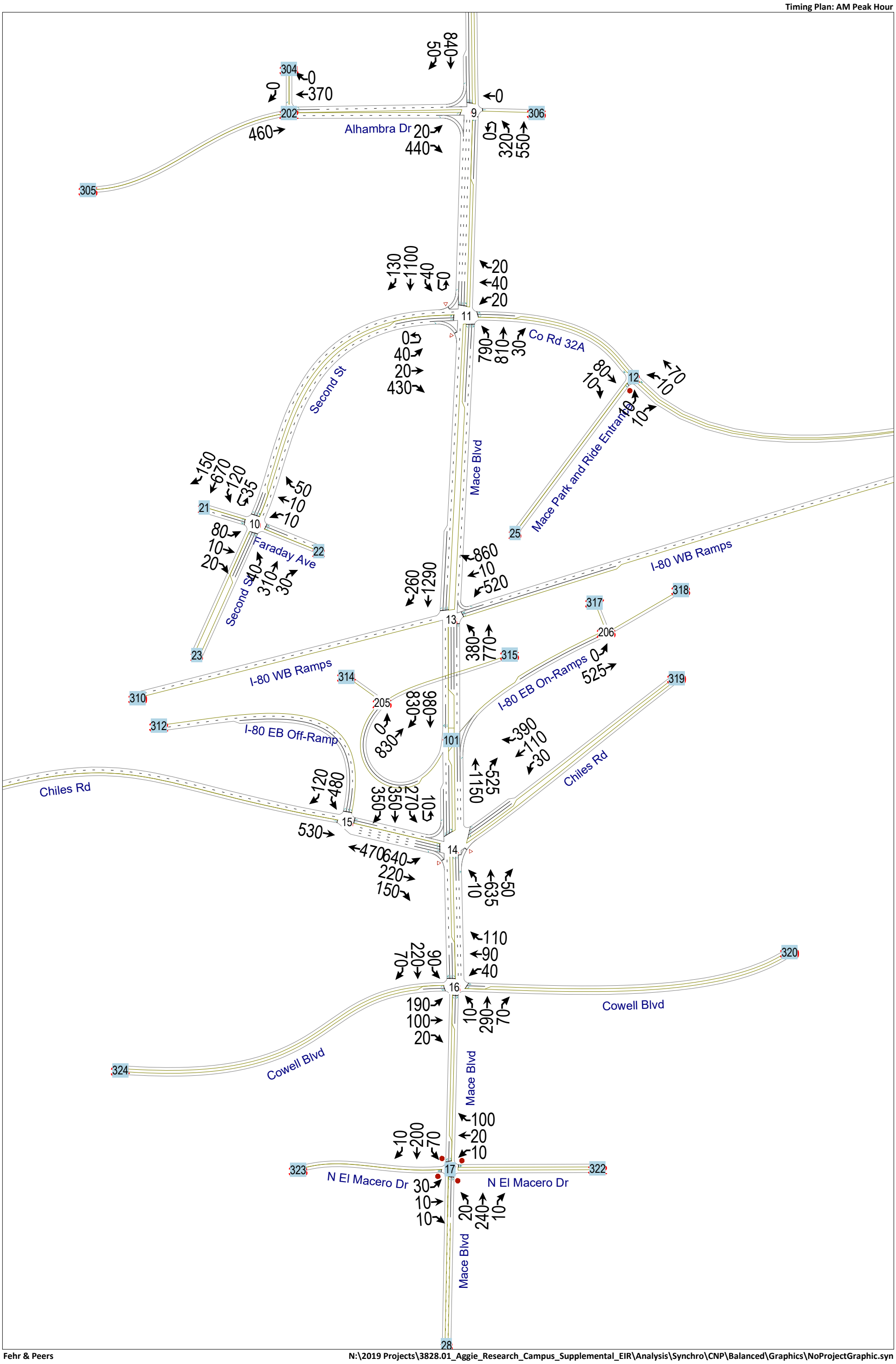
320
3
Co Rd 32A


E Covell Blvd
Pole Line Rd
Wright Blvd
Baywood Ln
Birch Ln
Marguerita Ln
Monarch Ln
Alhambra Blvd
Harper JR HS Access
31
29
34
24
8
7
6
5
4
3
2
1
32
35
26
36
27
30
44
260 450 200
120 520 110
210 460 140
120 220 50
680 60 10
650 60 70 30
10 680 40
30 0 0
20 650 20
0 0 30
680 20
660 30
50 30
40 650
80 560
10 0 0
0 600 20
810 30
30 0 0
760 110
150 50
470 40
410 170
680 130
10 100


Alhambra Dr
Second St
Mace Blvd
Co Rd 32A
Mace Park and Ride Entrance
Faraday Ave
I-80 WB Ramps
I-80 EB On-Ramps
I-80 EB Off-Ramp
Chiles Rd
Cowell Blvd
N El Macero Dr
304
305
306
202
9
460
0
370
840
50
0
320
550
130
1100
40
20
40
20
11
790
810
30
0
40
20
430
80
10
12
70
10
10
10
150
670
120
35
50
10
10
21
10
22
80
10
20
40
310
30
23
860
10
520
260
1290
13
317
318
206
380
770
315
0
525
314
205
830
980
830
0
310
312
101
319
390
110
30
525
1150
120
480
350
350
270
10
530
15
470
640
220
150
14
50
635
10
110
90
40
70
220
90
16
320
190
100
20
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200
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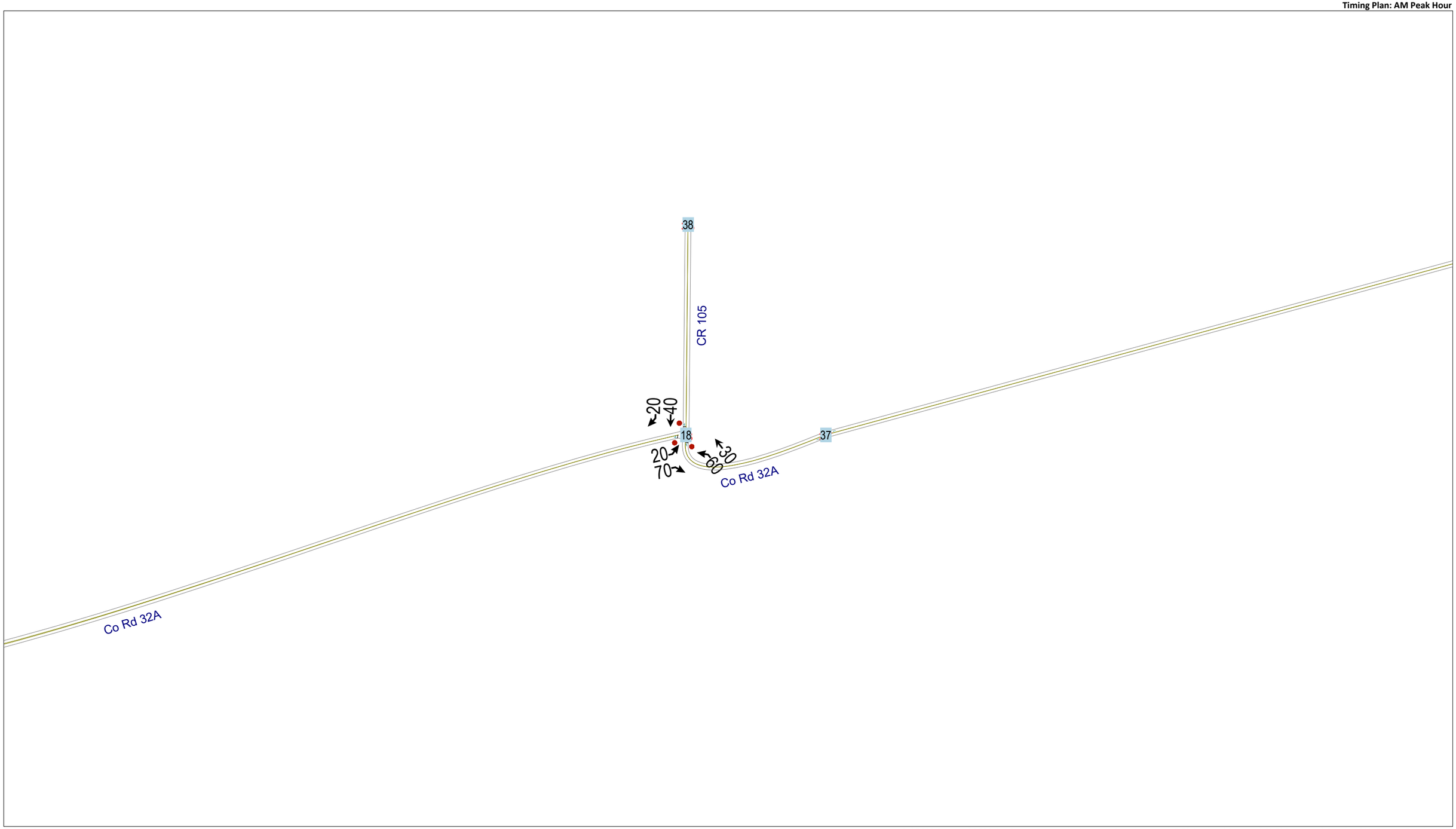
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CR 105
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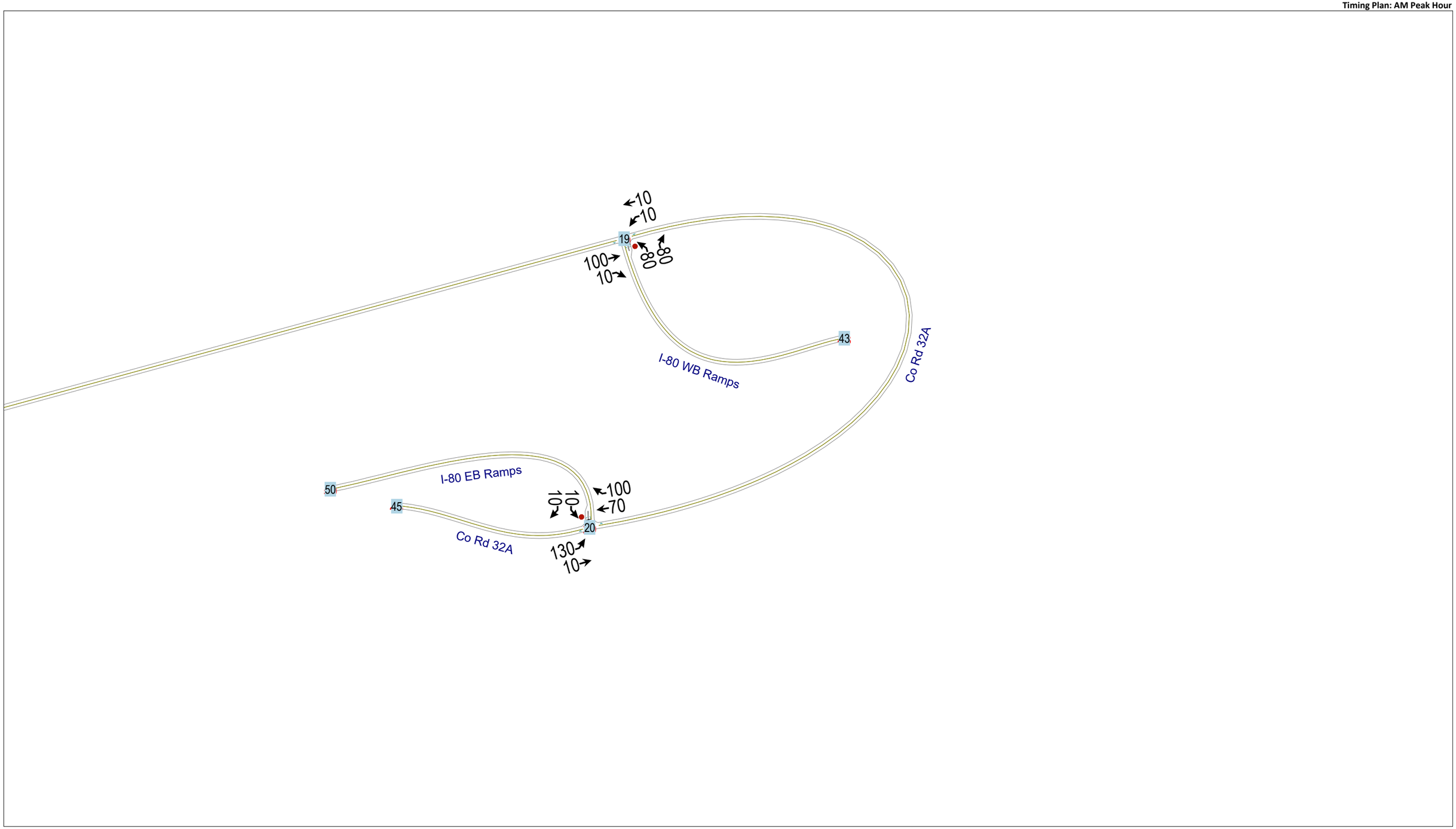
Co Rd 32A
Co Rd 32A


10
10
19
100
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80
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I-80 WB Ramps
Co Rd 32A
50
I-80 EB Ramps
45
Co Rd 32A
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100
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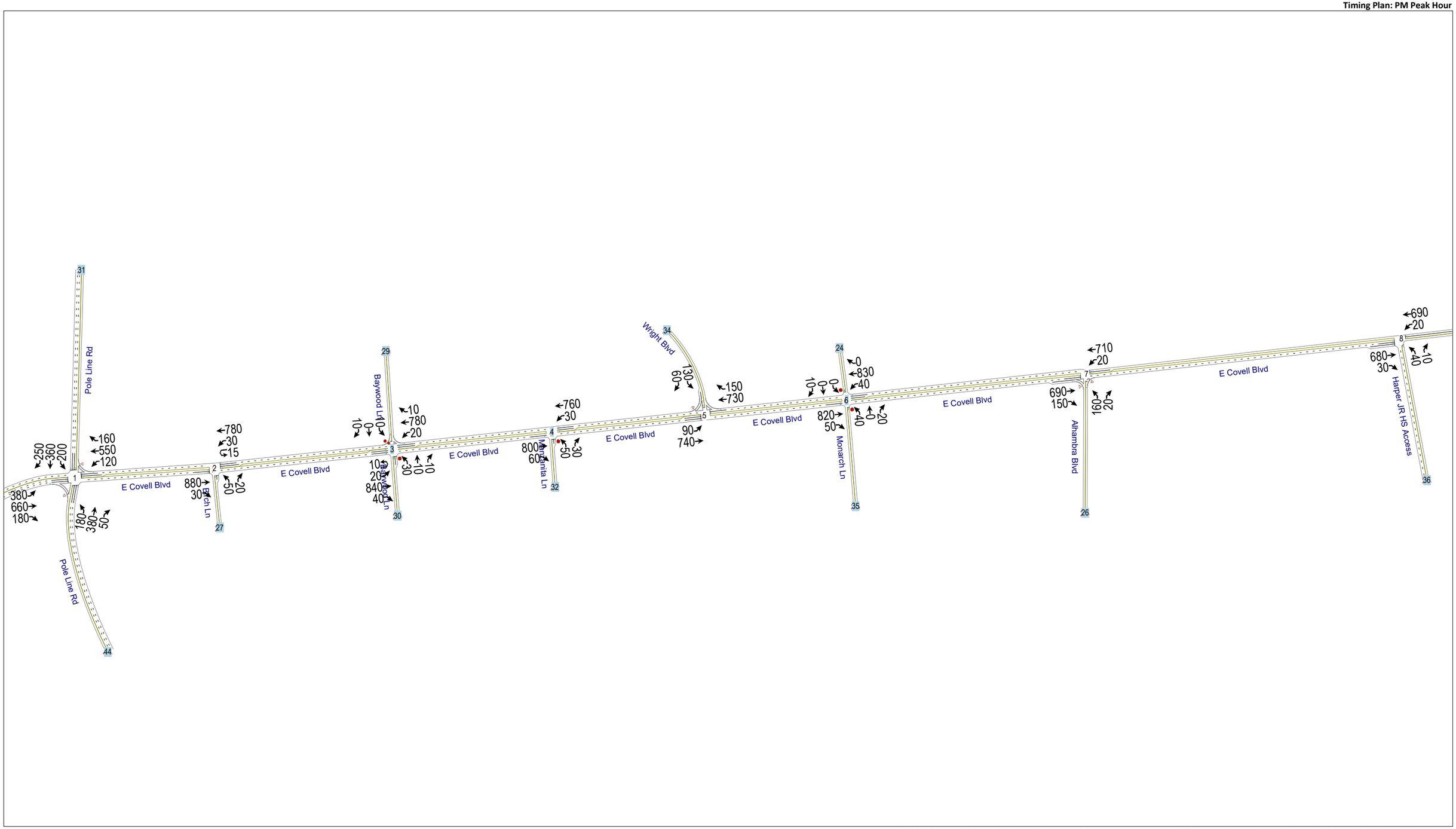
E Covell Blvd
Pole Line Rd
Wright Blvd
Baywood Ln
Birch Ln
Monarch Ln
Alhambra Blvd
Harper JR HS Access
31
29
34
24
8
7
6
5
4
3
2
1
27
30
32
35
26
36
44
250 360 200
160 550 120
380 660 180
180 380 50
780 30 15
880 30
50 20
10 780 20
10 10 0 0 840 40
30 10 10
760 30
800 60
50 30
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0 830 40
90 740
820 50
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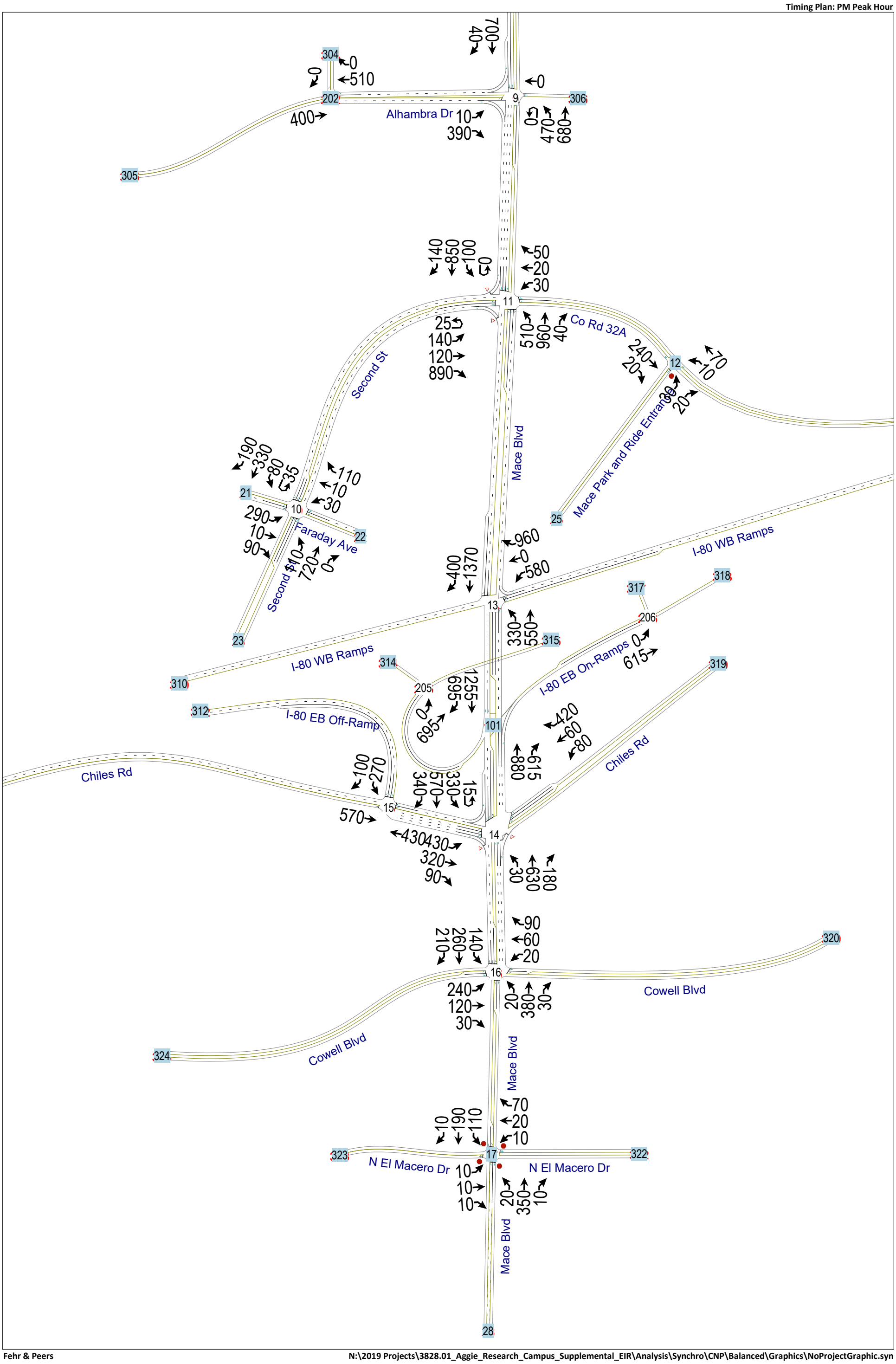
710 20
690 150
160 20
690 20
680 30
10 40


Alhambra Dr
Second St
Mace Blvd
Co Rd 32A
Mace Park and Ride Entrance
Faraday Ave
I-80 WB Ramps
I-80 EB On-Ramps
I-80 EB Off-Ramp
Chiles Rd
Cowell Blvd
N El Macero Dr
304
202
9
306
305
11
12
21
10
22
25
23
13
317
318
206
315
314
205
319
310
312
101
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14
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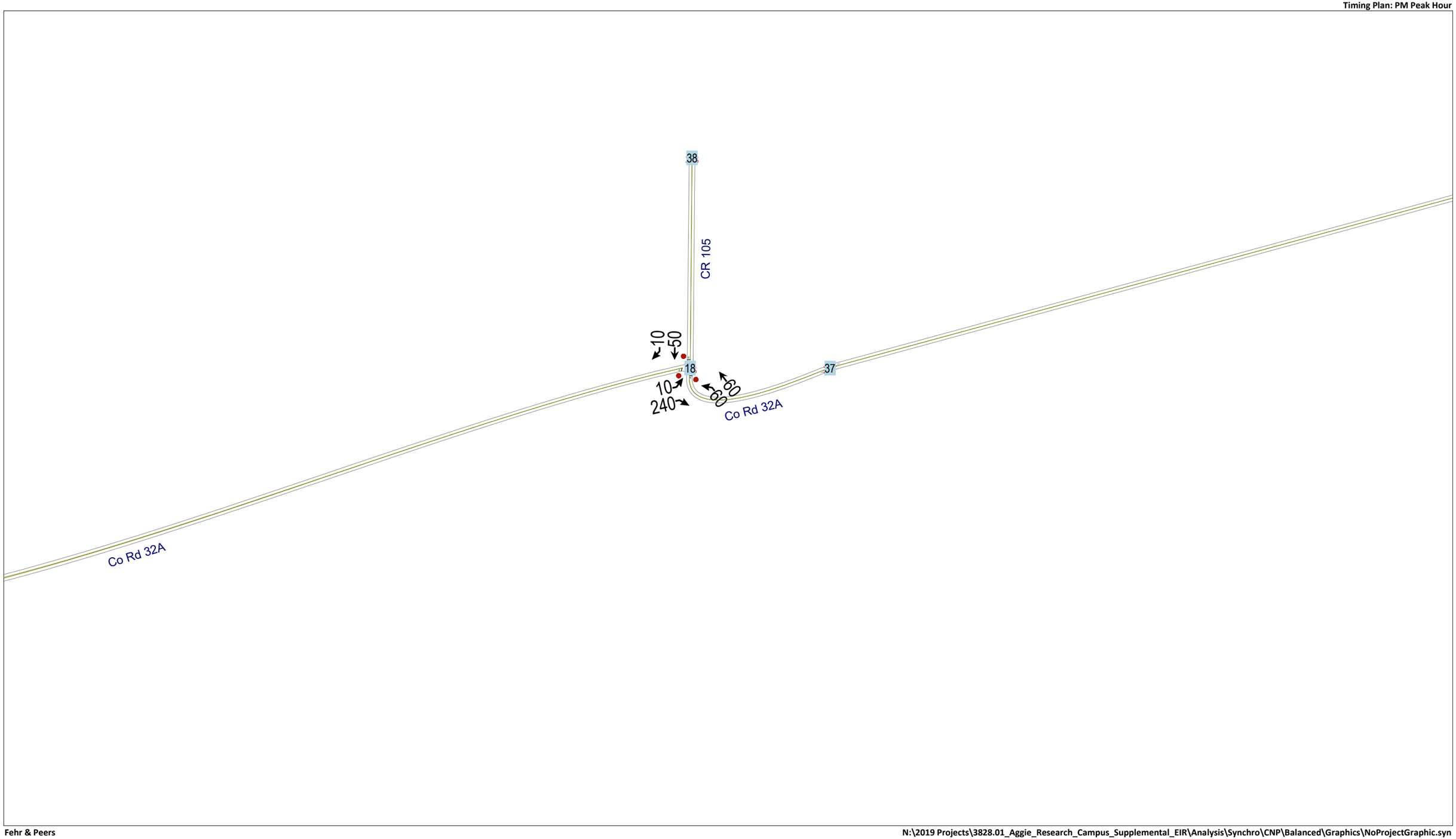
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CR 105
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18
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240
60
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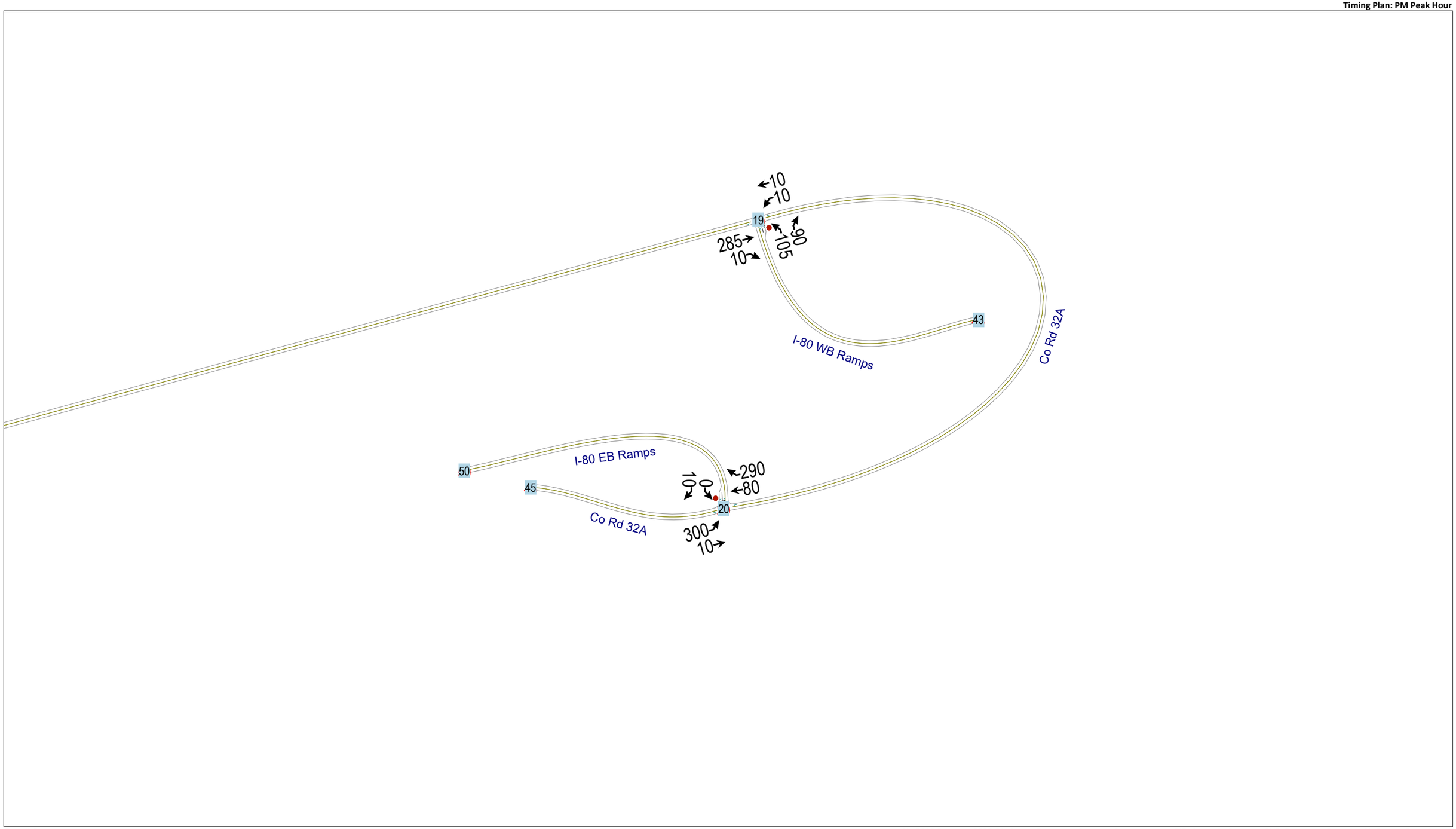
37
Co Rd 32A
Co Rd 32A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10
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285
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90
105
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Co Rd 32A
50
I-80 EB Ramps
45
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0
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80
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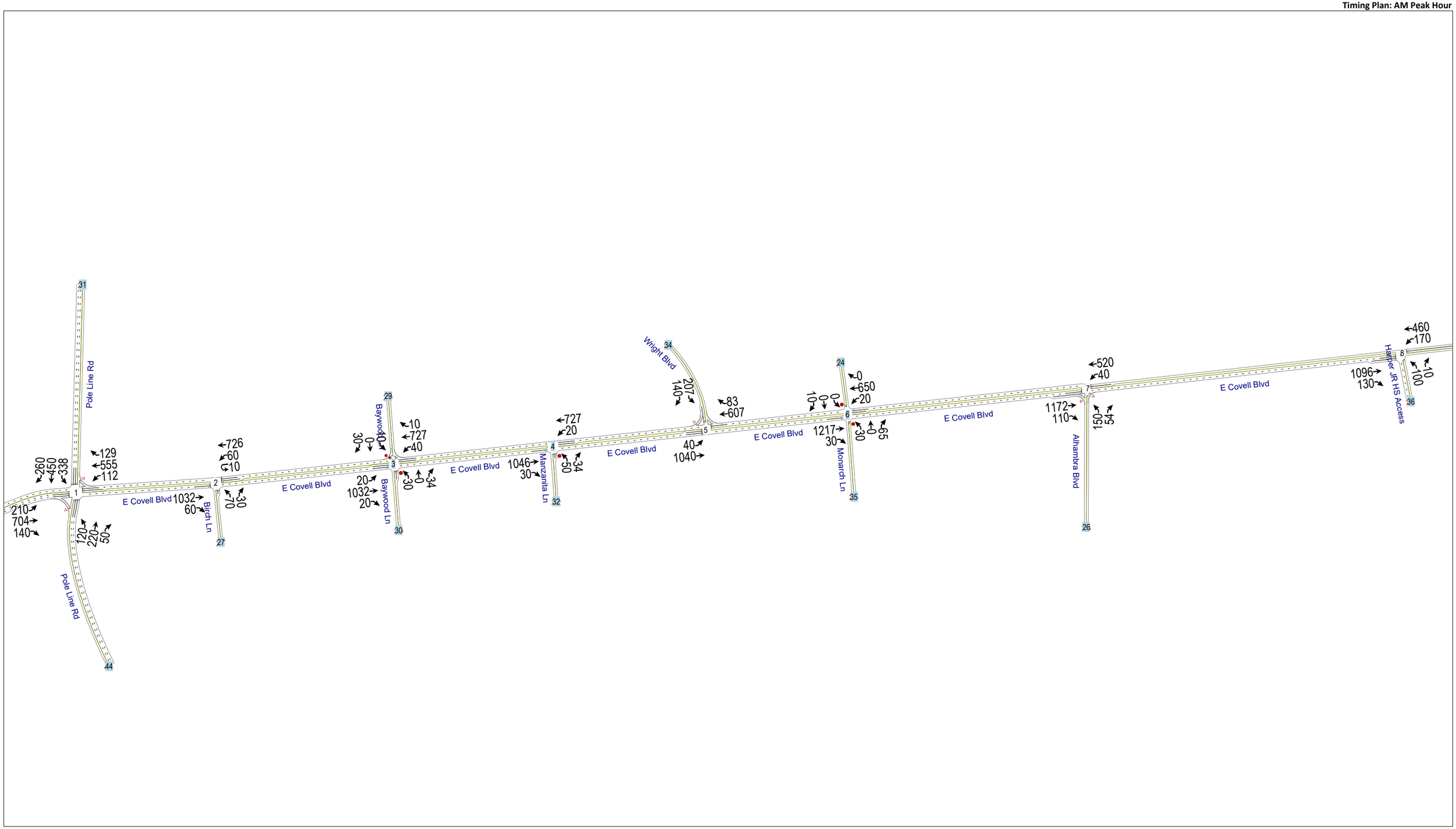
Co Rd 32A
300
10


E Covell Blvd
Pole Line Rd
Wright Blvd
Baywood Ln
Birch Ln
Manzanita Ln
Monarch Ln
Alhambra Blvd
Harper JR HS Access
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27
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31
32
34
35
36
44
260 450 338
129 555 112
210 704 140
120 220 50
726 60 10
30
1032 60
70 30
20 1032 20
30 0 40
10 727 40
30 0 34
727 20
1046 30
50 34
207 140
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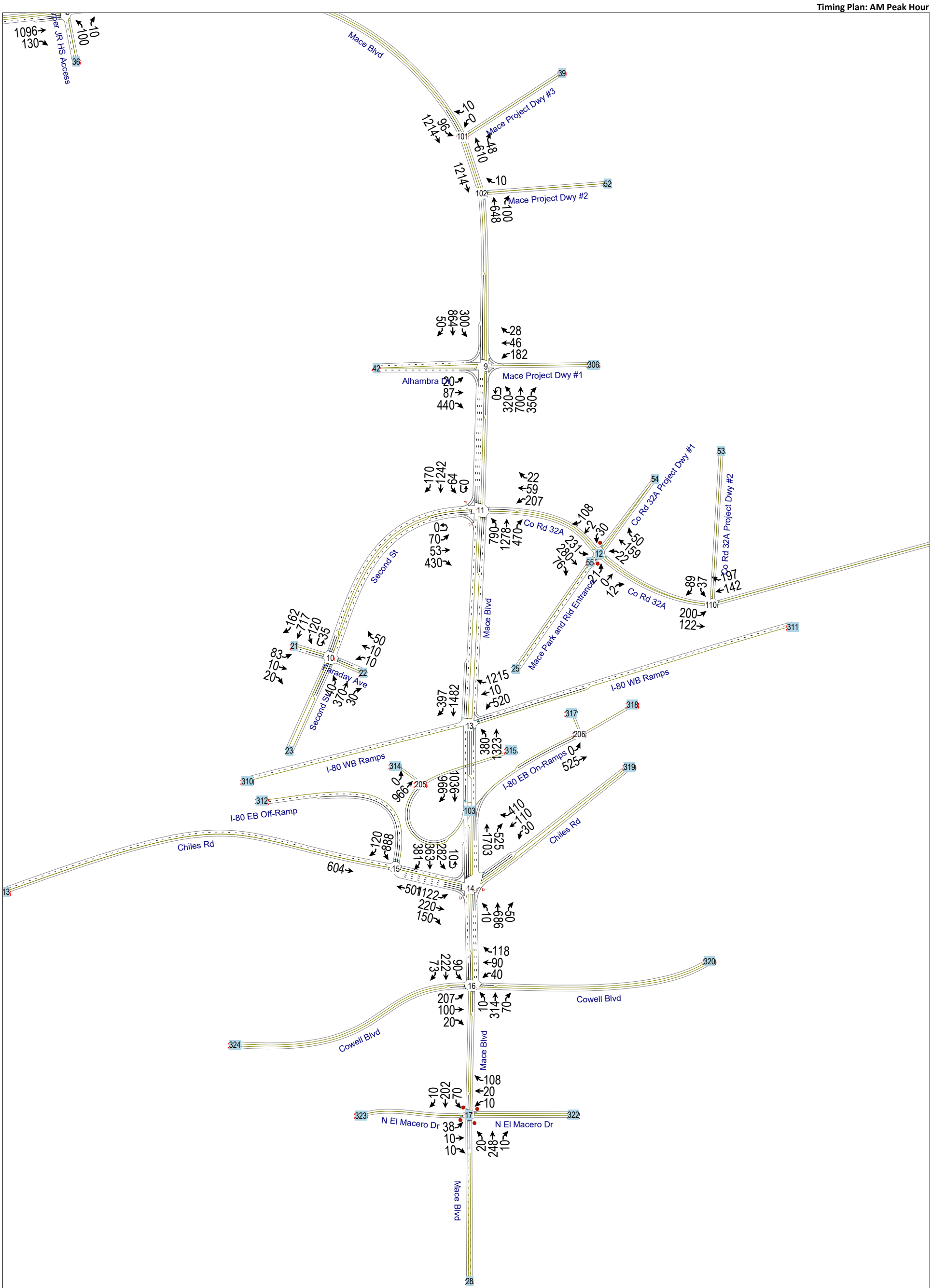
10 0 0
0 650 20
1217 30
30 0 65
520 40
1172 110
150 54
1096 130
460 170
10 100


Mace Blvd
Mace Project Dwy #3
Mace Project Dwy #2
Mace Project Dwy #1
Alhambra Dr
Second St
Faraday Ave
Mace Park and Rid Entrance
Co Rd 32A
Co Rd 32A Project Dwy #1
Co Rd 32A Project Dwy #2
I-80 WB Ramps
I-80 EB On-Ramps
I-80 EB Off-Ramp
Chiles Rd
Cowell Blvd
N El Macero Dr
1096
130
10
100
36
39
1214
96
101
10
0
610
48
52
102
10
648
100
300
864
50
28
46
182
42
9
306
20
87
440
50
320
700
350
170
1242
64
0
11
22
59
207
108
2
30
790
1278
470
53
430
70
0
12
55
231
280
96
54
53
89
37
197
142
110
200
122
311
162
717
120
35
21
83
10
20
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50
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22
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370
30
23
10
25
1215
10
520
397
1482
13
317
318
206
380
323
315
0
525
314
205
0
966
966
1036
310
312
103
410
110
30
525
1703
319
120
888
381
363
282
10
604
15
501
1122
220
150
14
10
686
50
118
90
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73
222
90
16
207
100
20
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108
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10
202
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323
17
322
38
10
10
20
248
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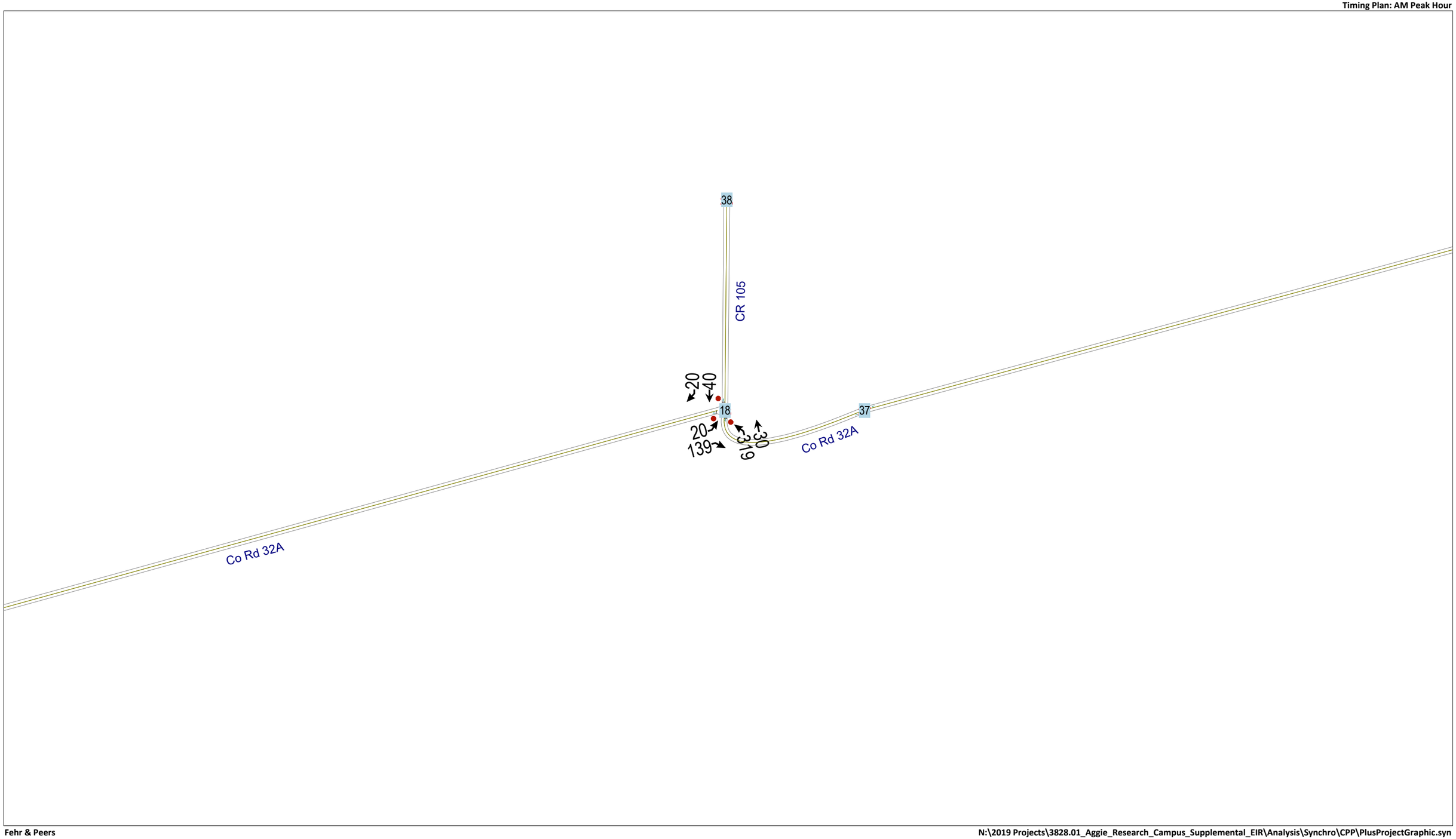
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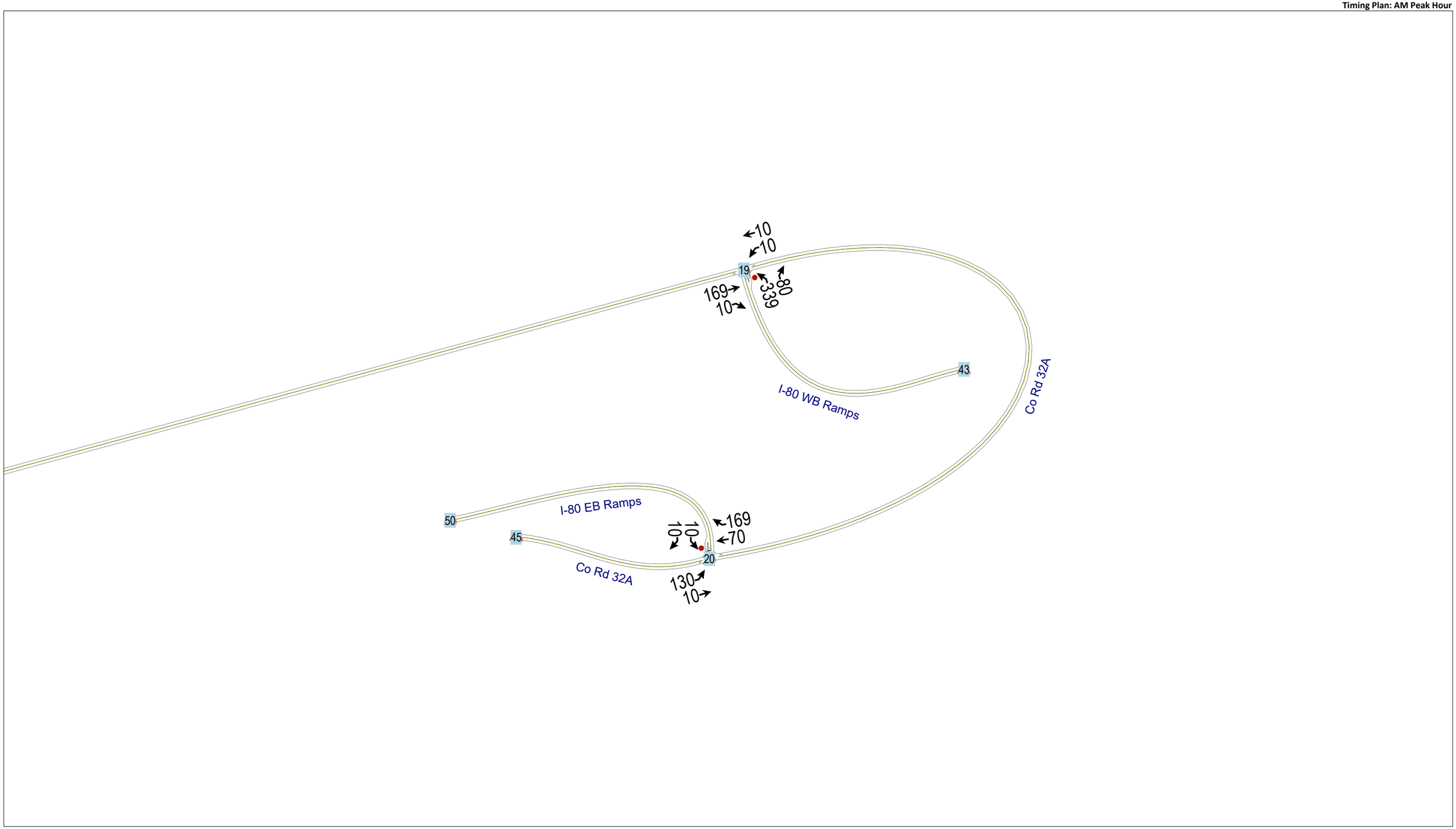
Co Rd 32A
Co Rd 32A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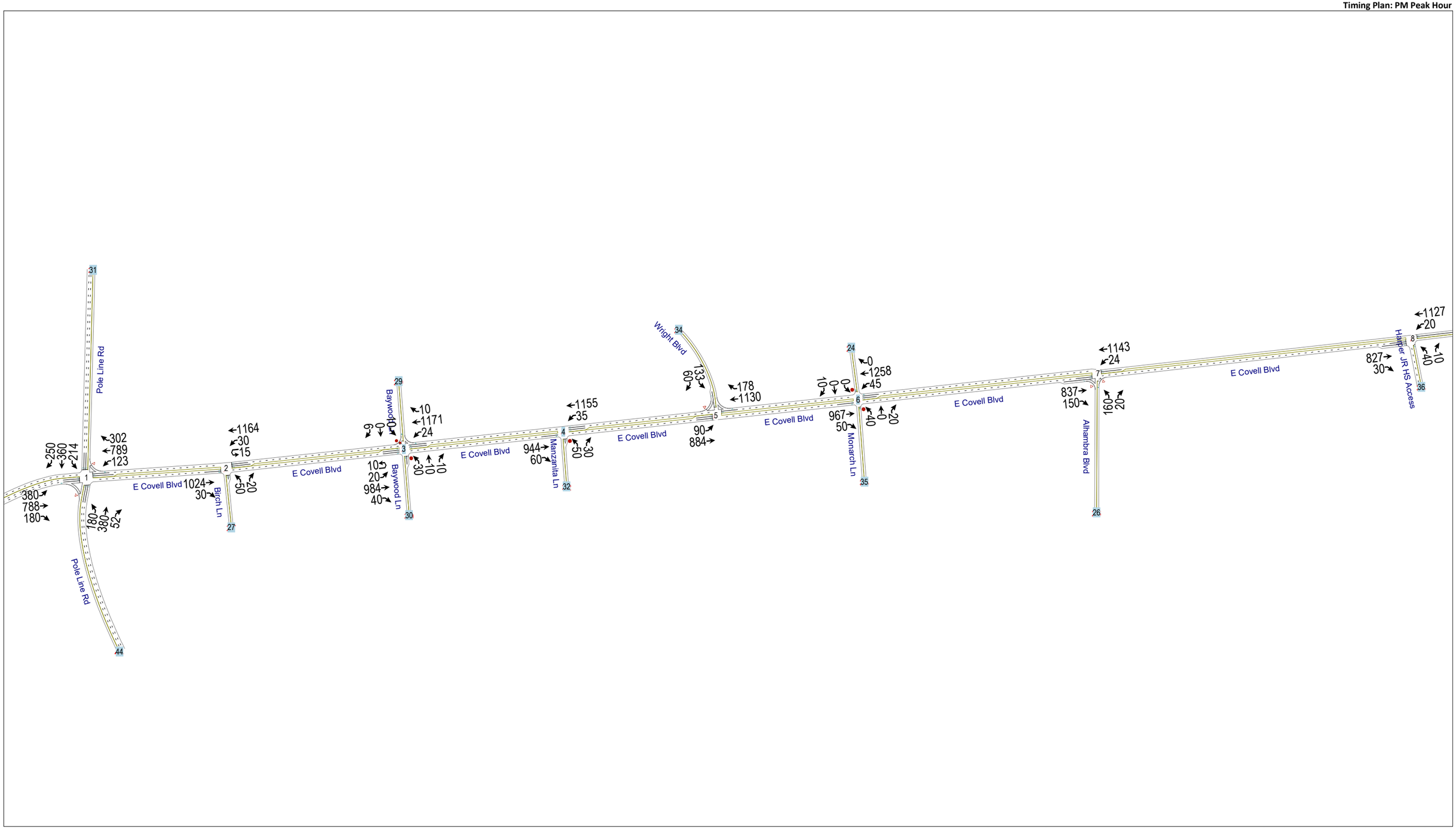
E Covell Blvd
Pole Line Rd
Baywood Ln
Birch Ln
Wright Blvd
Manzanita Ln
Monarch Ln
Alhambra Blvd
Harper JR HS Access
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180 380 52
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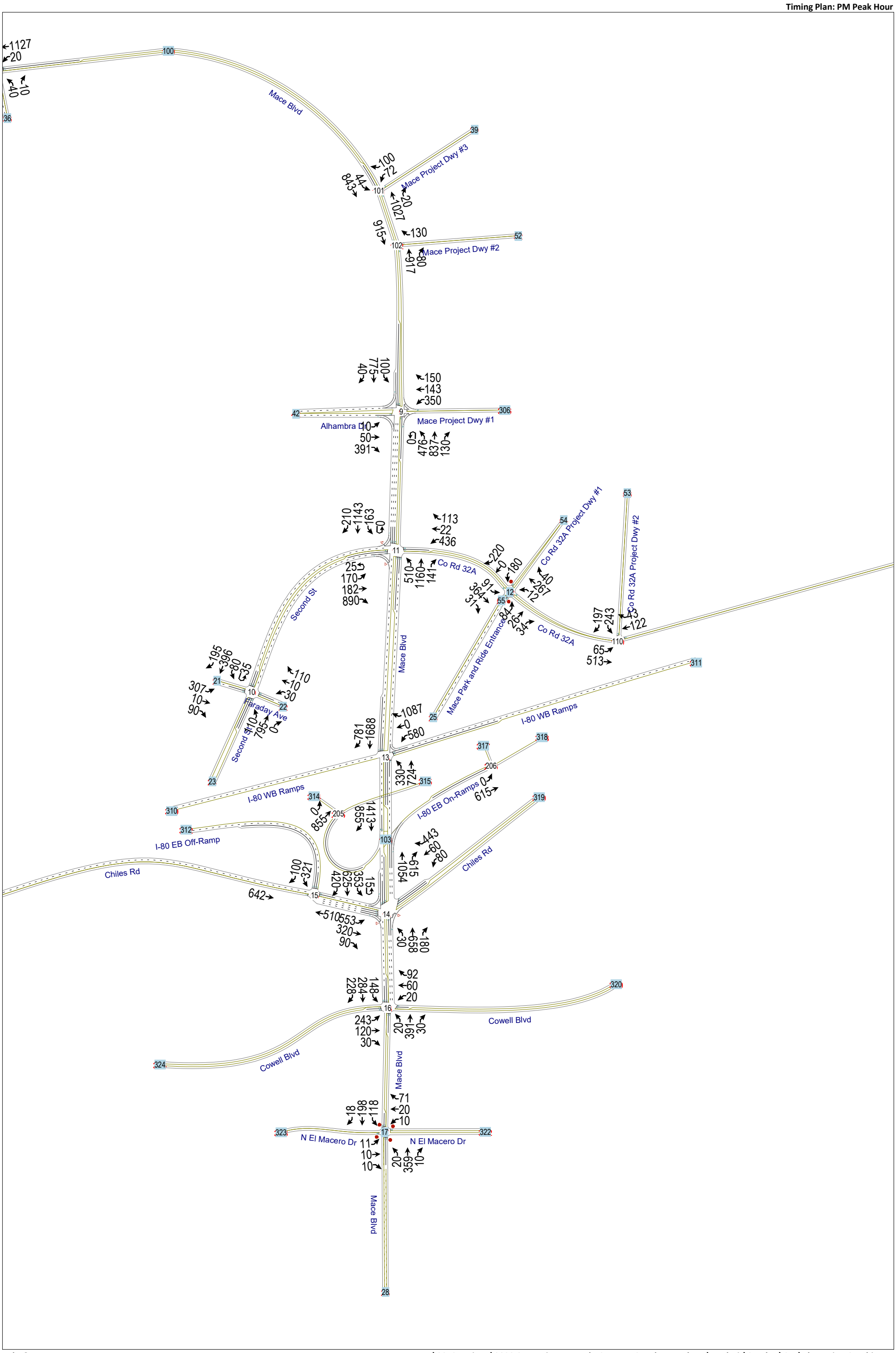
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Mace Project Dwy #2
Alhambra Dr
Mace Project Dwy #1
Co Rd 32A
Co Rd 32A Project Dwy #1
Co Rd 32A Project Dwy #2
Mace Park and Ride Entrance
Second St
Faraday Ave
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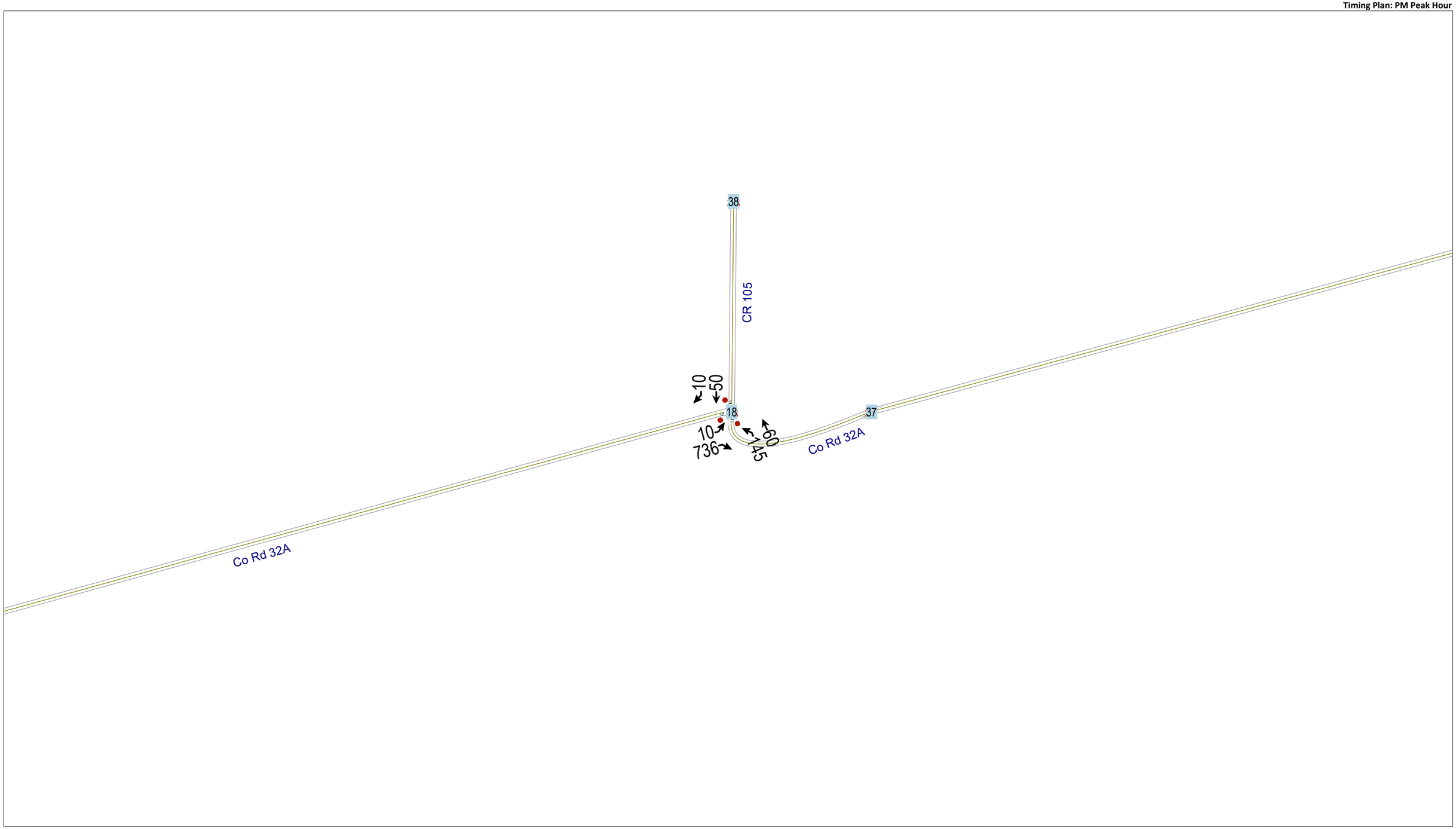
I-80 EB On-Ramps
I-80 EB Off-Ramp
Chiles Rd
Cowell Blvd
N El Macero Dr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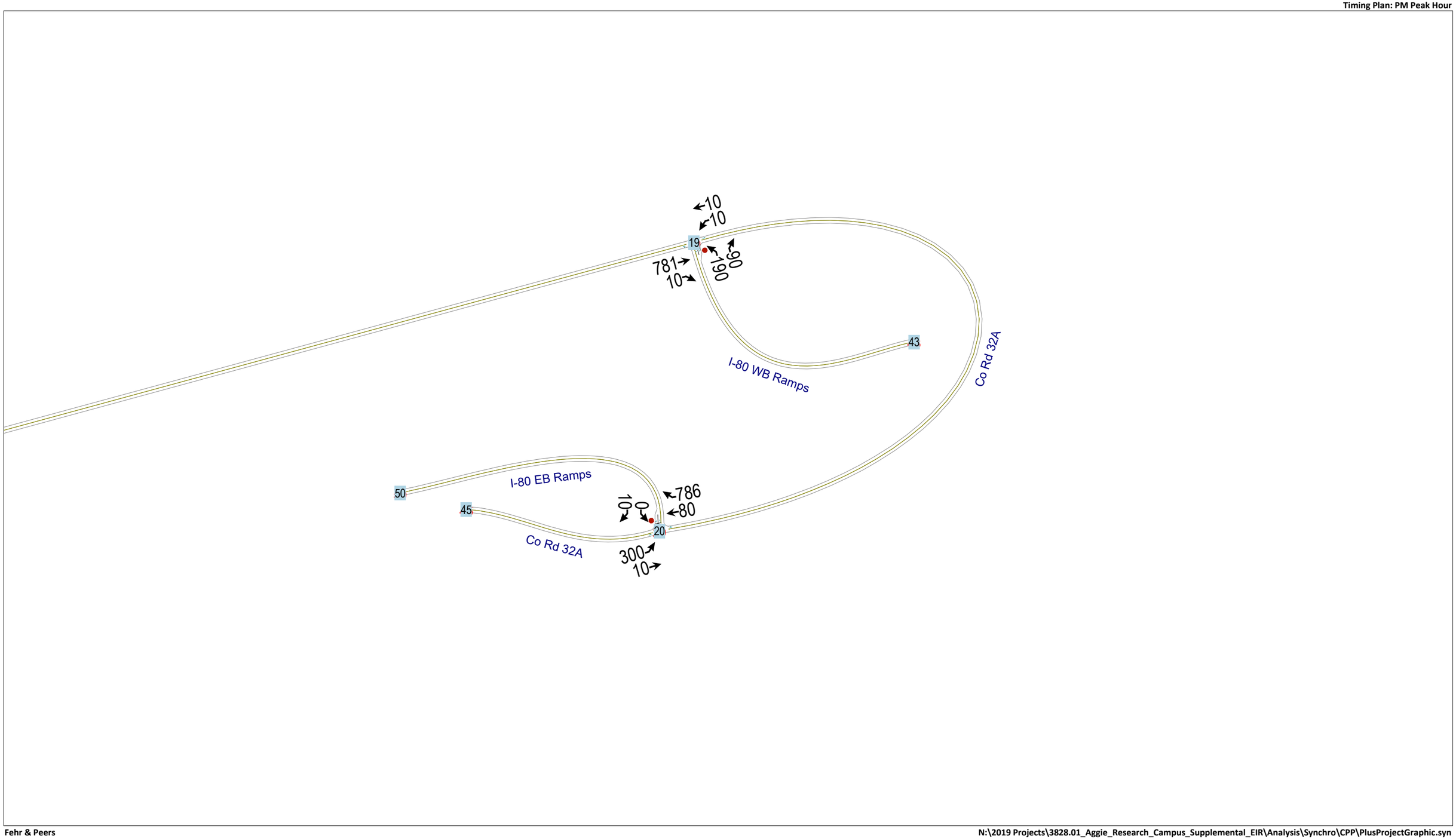
Co Rd 32A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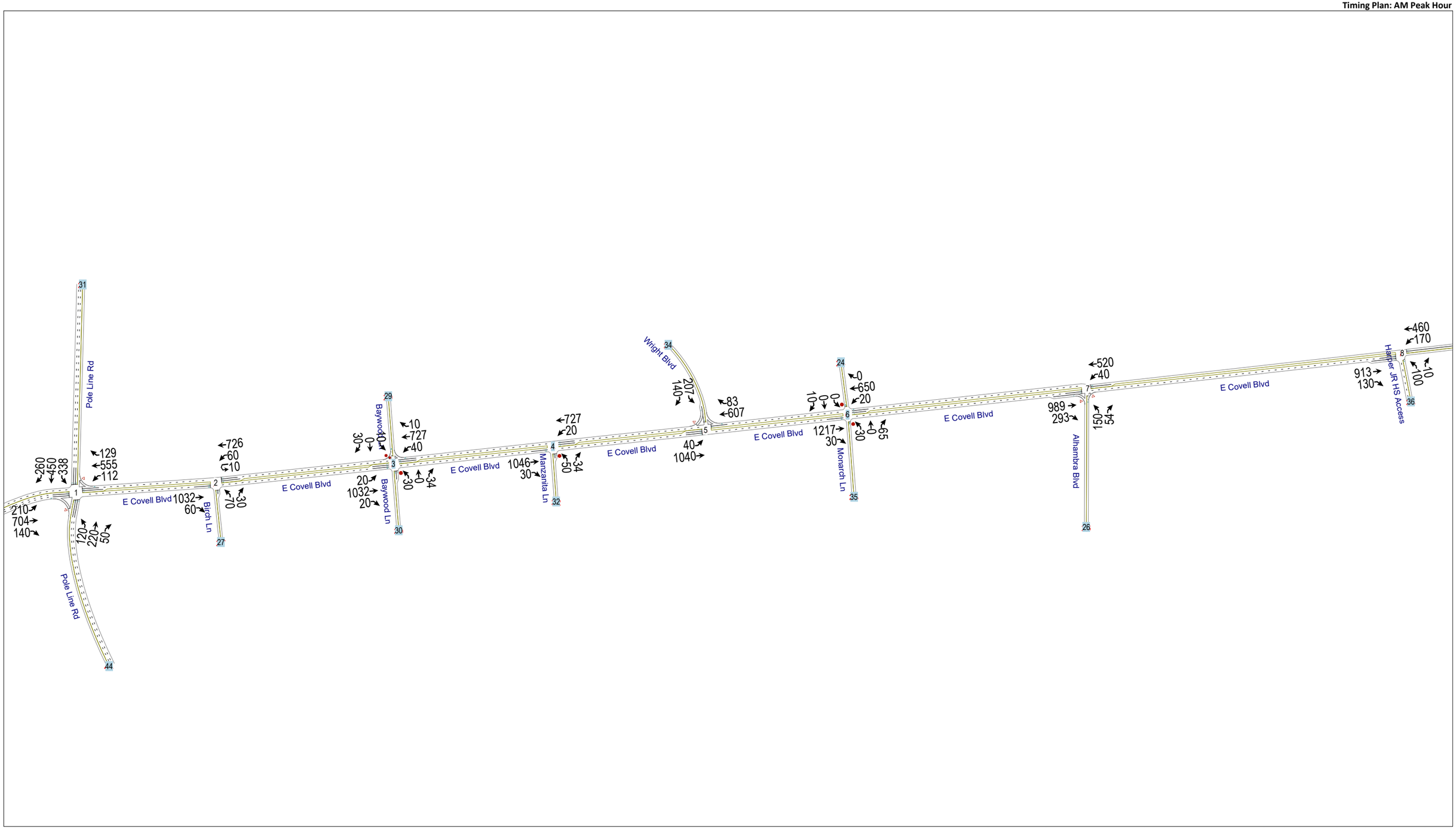
E Covell Blvd
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Birch Ln
Manzanita Ln
Monarch Ln
Alhambra Blvd
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120 220 50
726 60 10
30 70
20 1032 60
30 0 40
10 727 40
30 0 34
727 20
1046 30
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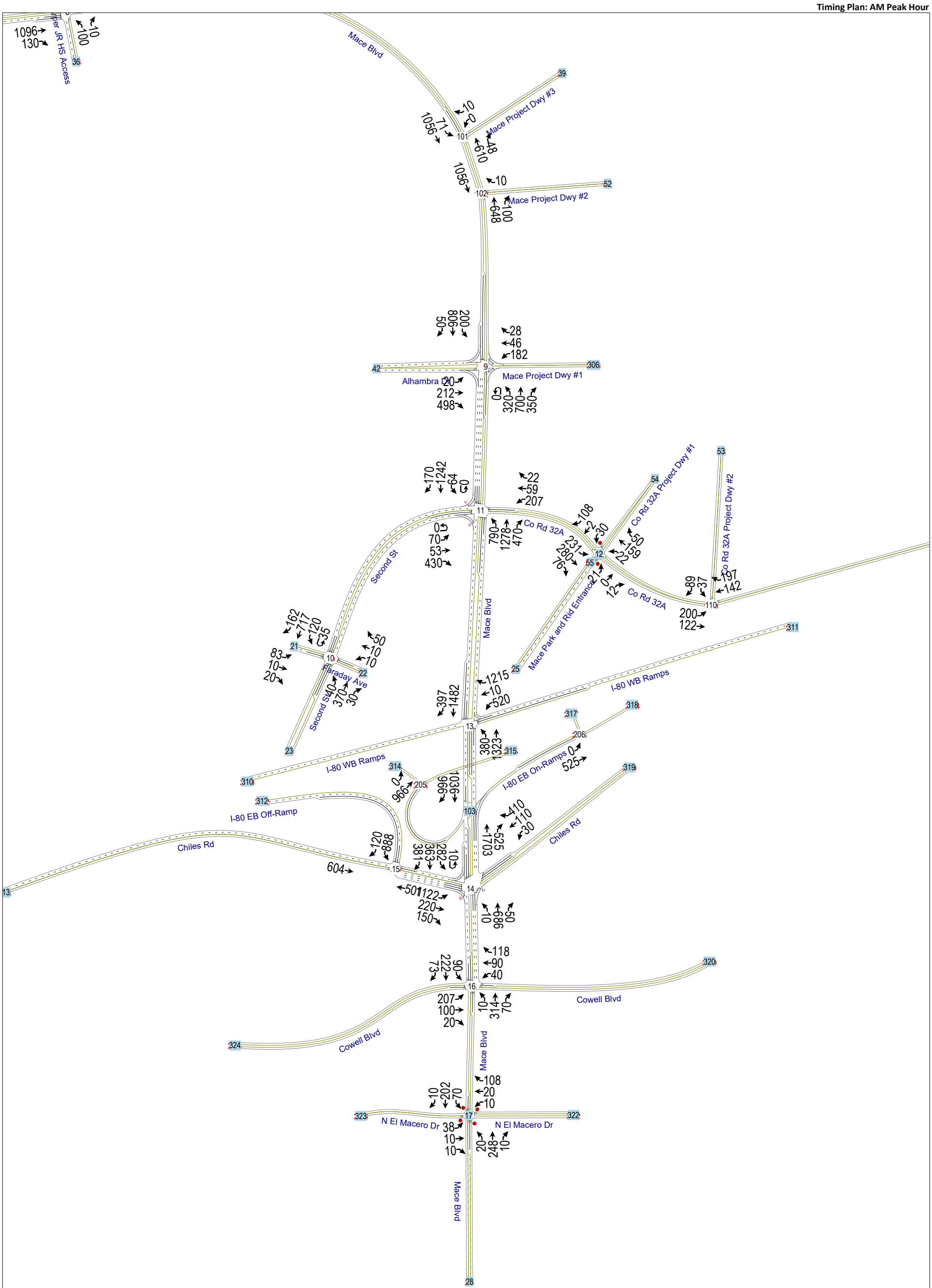
Mace Blvd
Mace Project Dwy #3
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Mace Project Dwy #1
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Second St
Faraday Ave
Mace Park and Rid Entrance
Co Rd 32A
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I-80 EB Off-Ramp
Chiles Rd
Cowell Blvd
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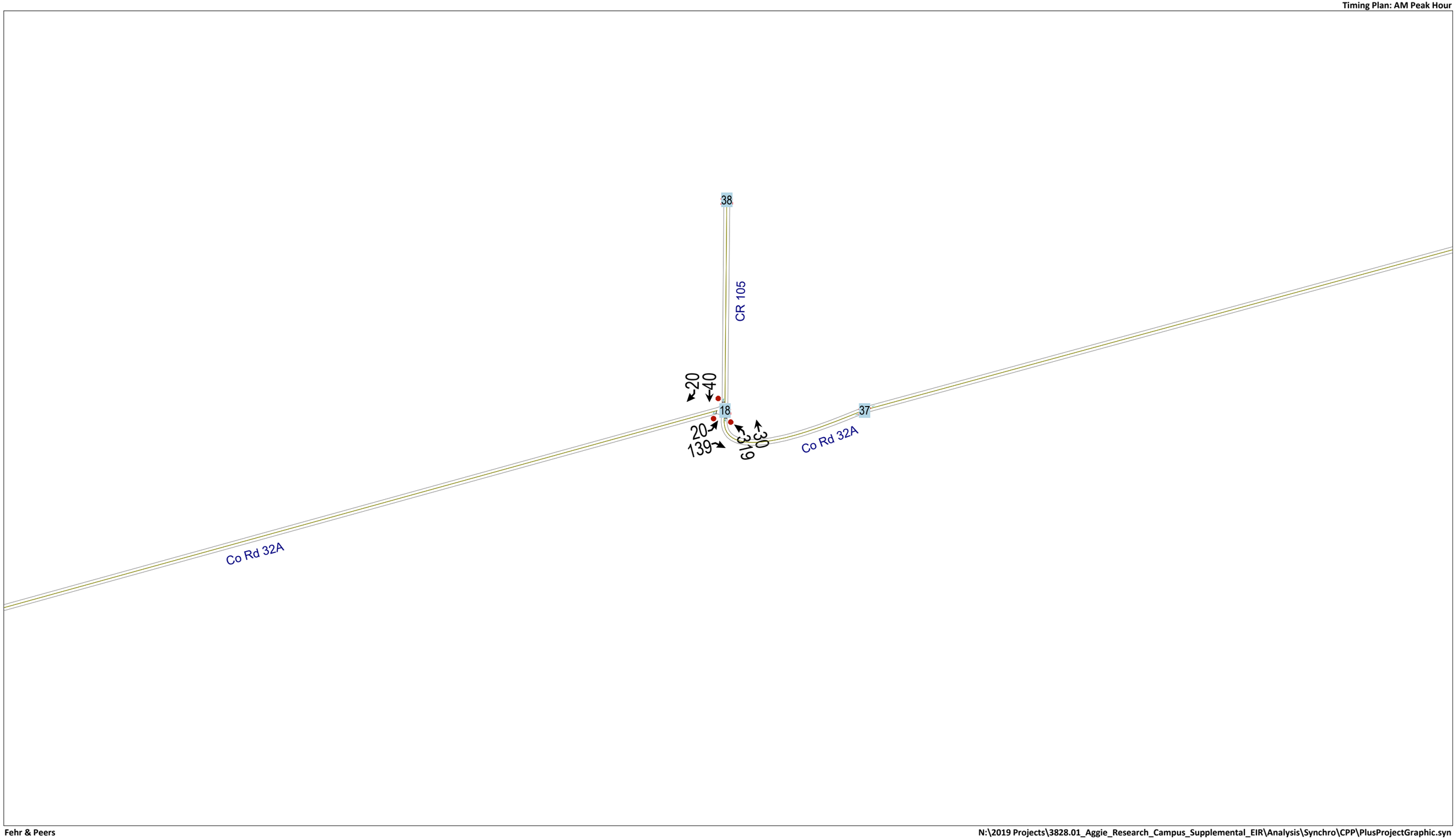
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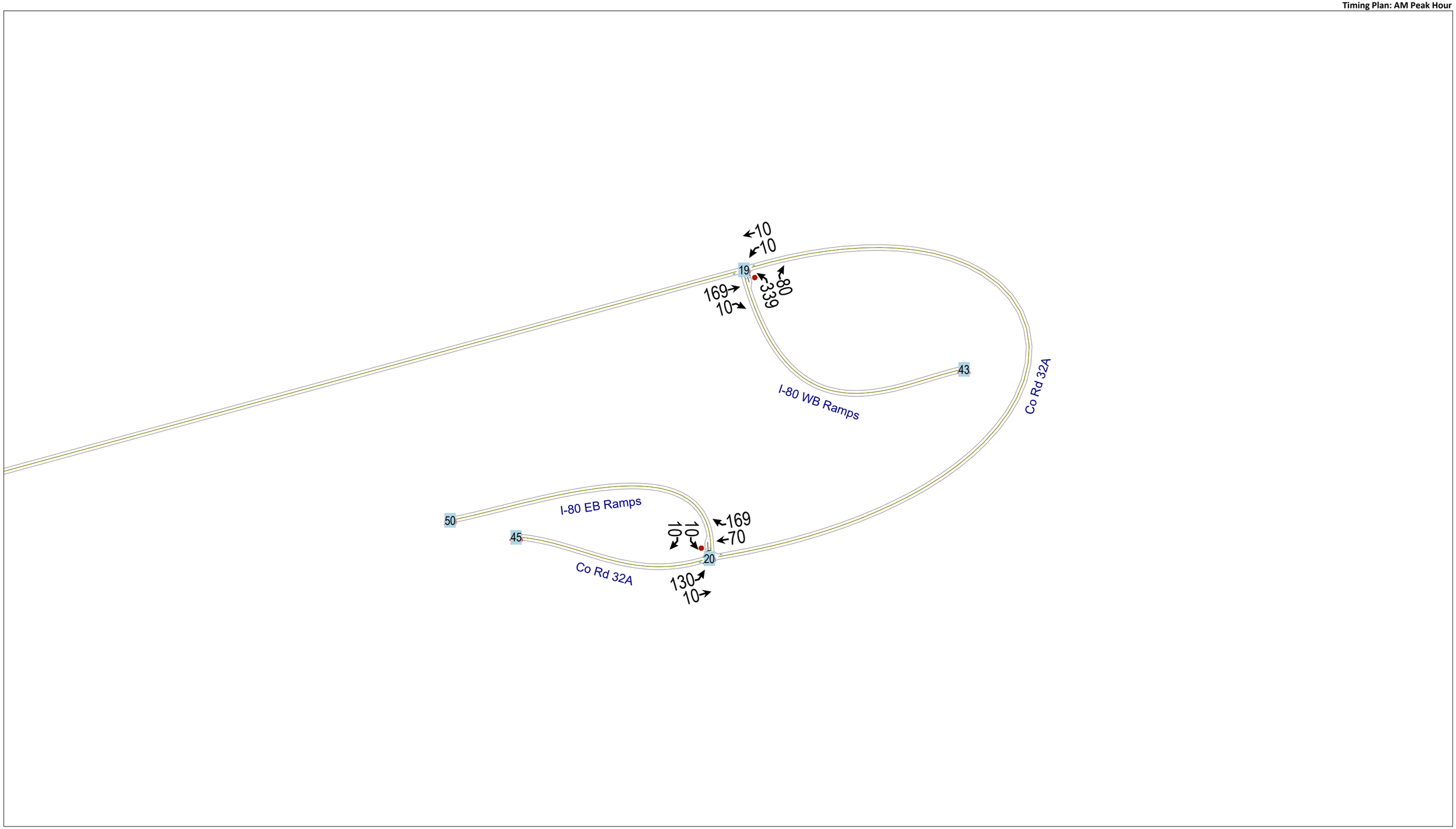
Co Rd 32A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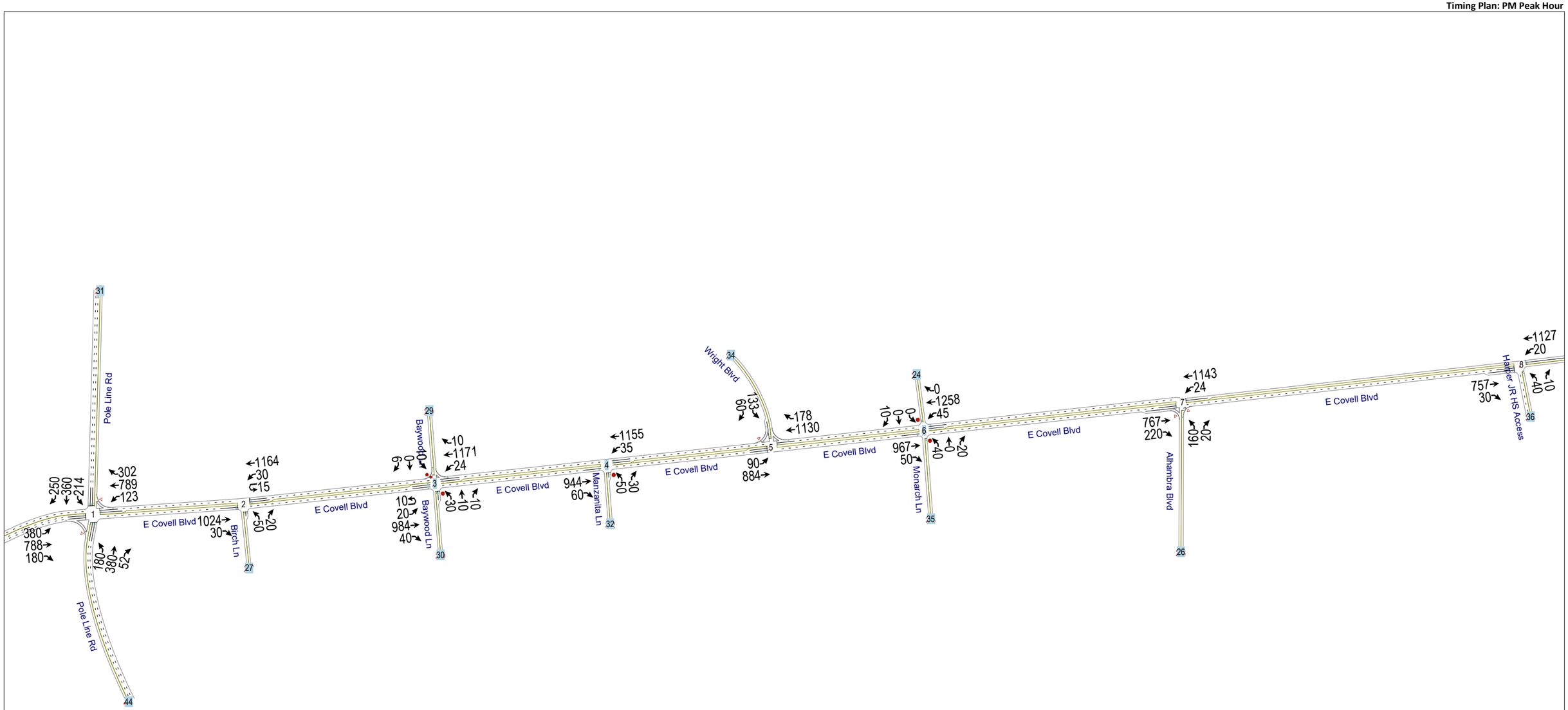
E Covell Blvd
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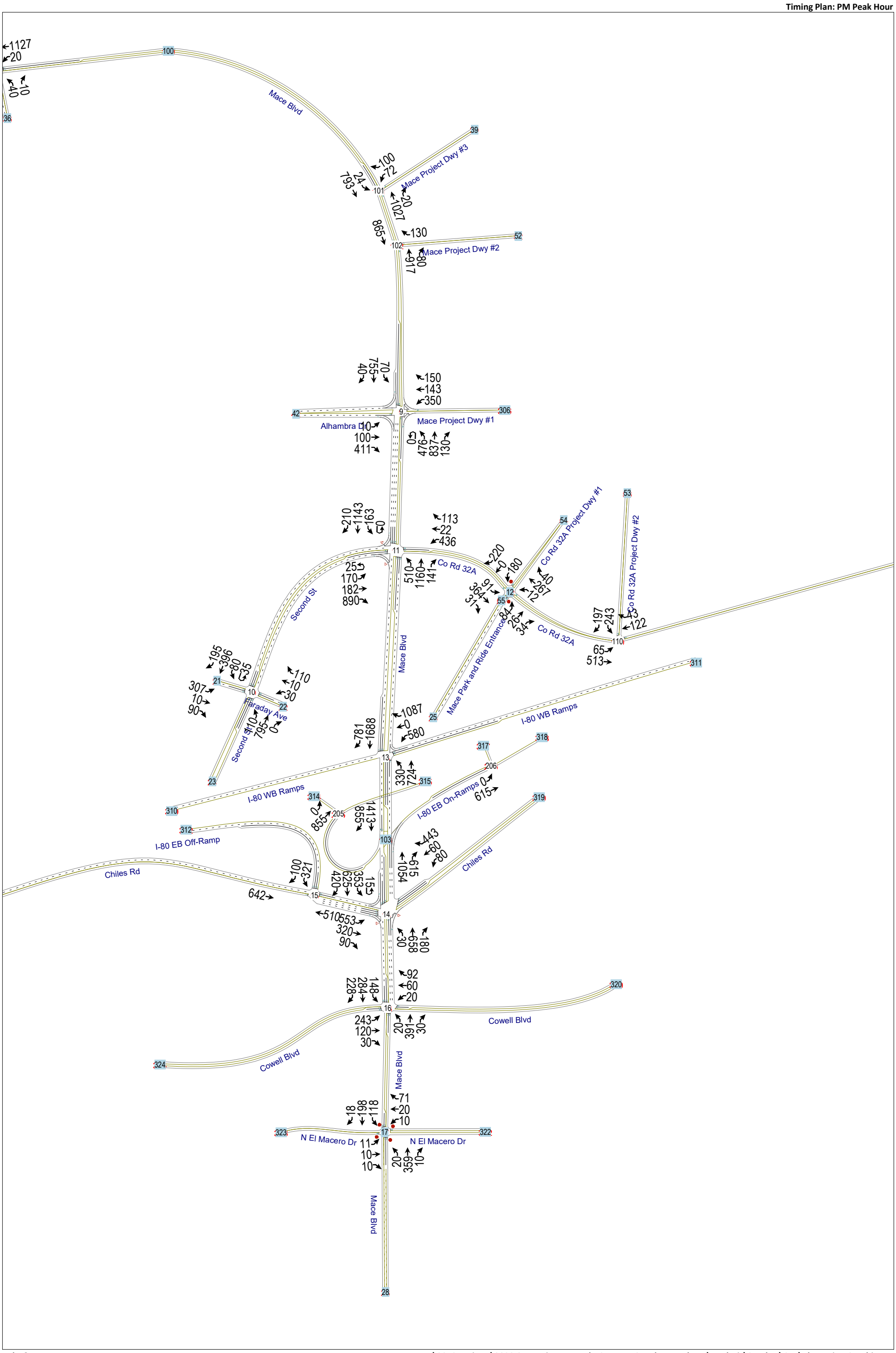
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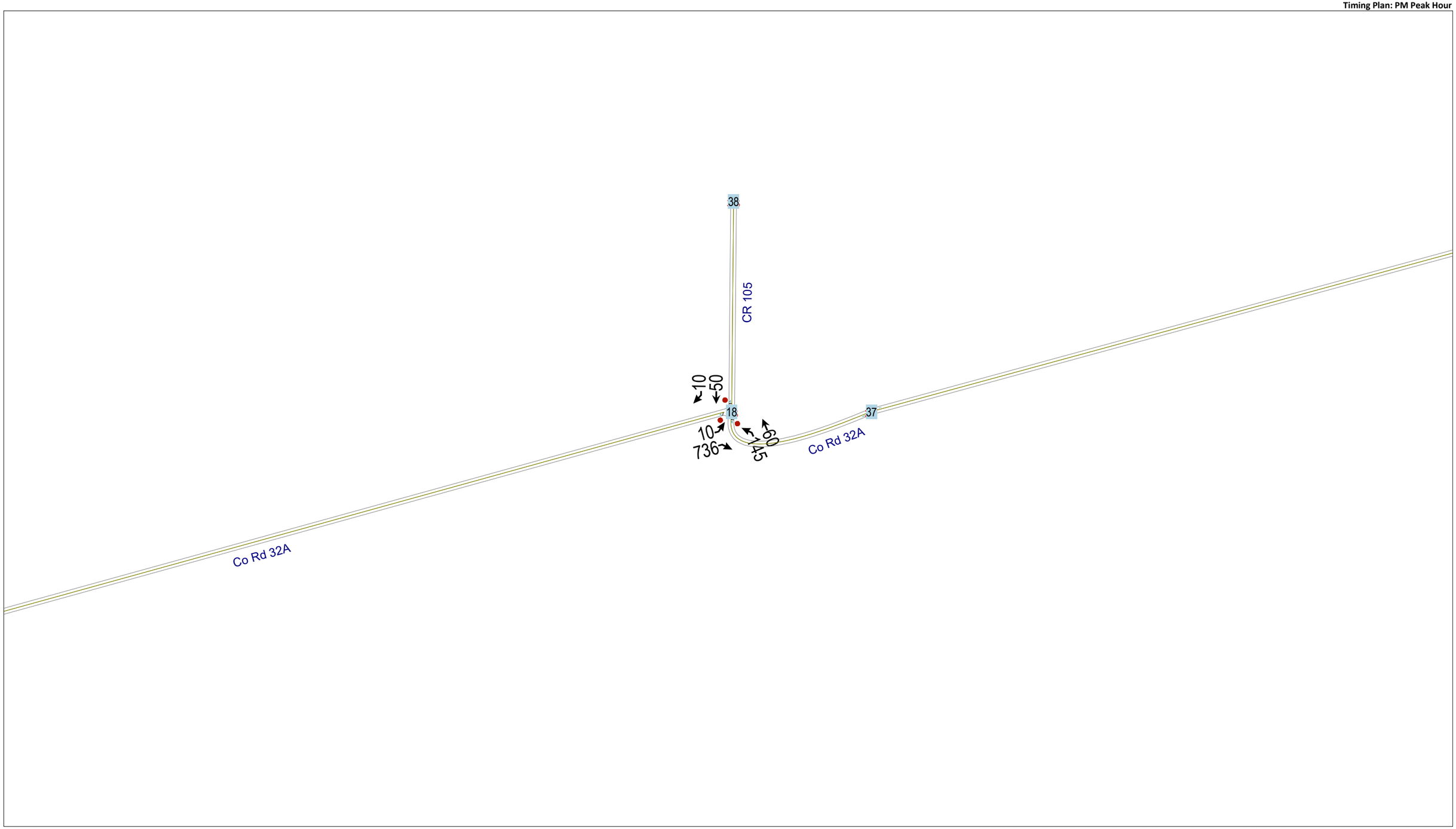
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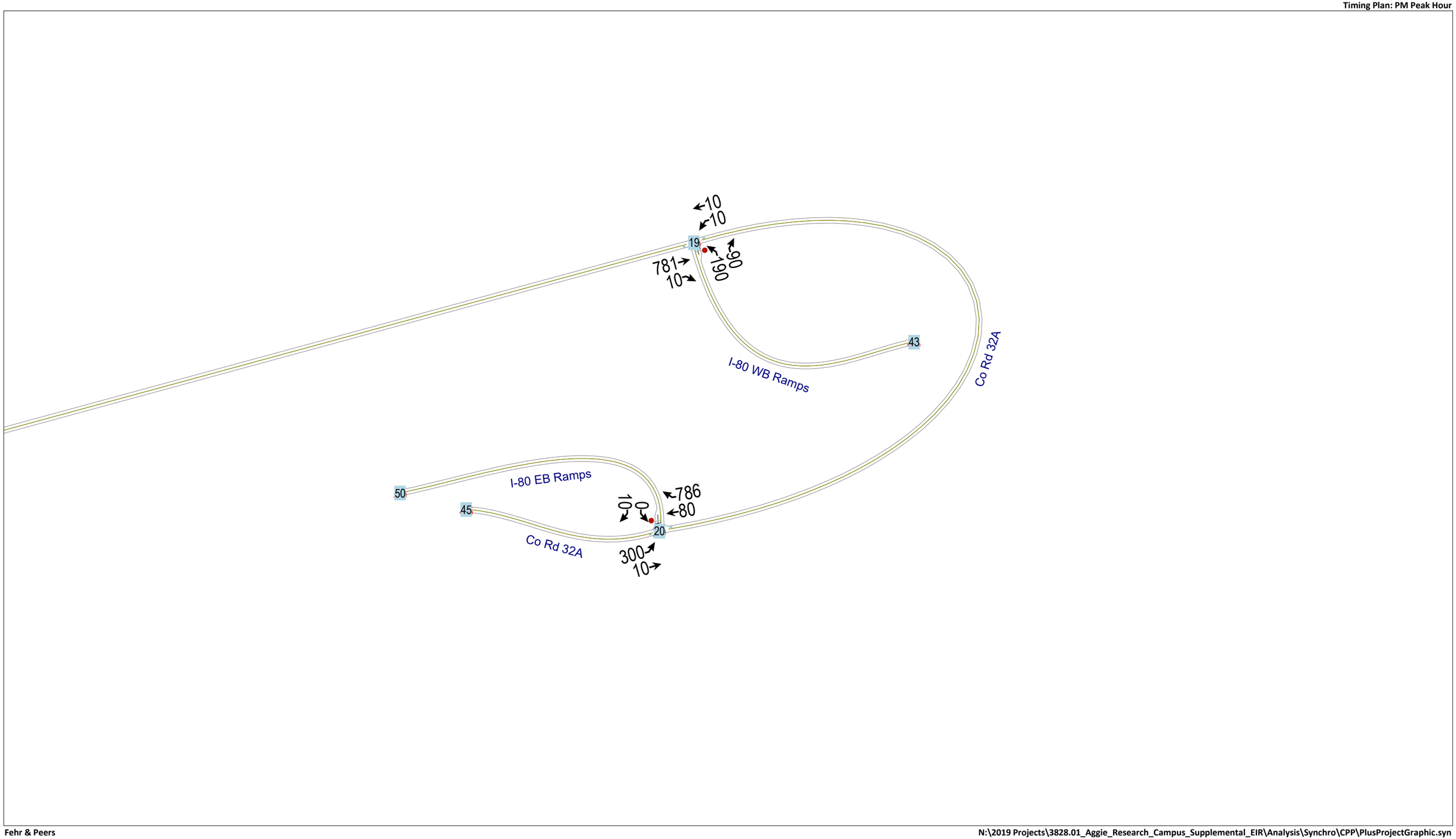
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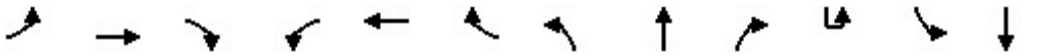


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	153	442	132	91	462	105	114	192	40	2	179	358
Future Volume (veh/h)	153	442	132	91	462	105	114	192	40	2	179	358
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach		No			No			No				No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870		1870	1870
Adj Flow Rate, veh/h	168	486	0	100	508	0	125	211	4		197	393
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91		0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2
Cap, veh/h	221	949		133	773		166	395	323		254	486
Arrive On Green	0.12	0.27	0.00	0.07	0.22	0.00	0.09	0.21	0.21		0.14	0.26
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	1870	1529		1781	1870
Grp Volume(v), veh/h	168	486	0	100	508	0	125	211	4		197	393
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1870	1529		1781	1870
Q Serve(g_s), s	5.4	6.9	0.0	3.3	7.7	0.0	4.0	5.9	0.1		6.3	11.6
Cycle Q Clear(g_c), s	5.4	6.9	0.0	3.3	7.7	0.0	4.0	5.9	0.1		6.3	11.6
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00		1.00	
Lane Grp Cap(c), veh/h	221	949		133	773		166	395	323		254	486
V/C Ratio(X)	0.76	0.51		0.75	0.66		0.75	0.53	0.01		0.78	0.81
Avail Cap(c_a), veh/h	1055	2346		905	1745		754	728	595		694	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	25.0	18.4	0.0	26.8	21.1	0.0	26.1	20.7	18.4		24.4	20.5
Incr Delay (d2), s/veh	5.3	0.4	0.0	8.2	1.0	0.0	6.7	1.1	0.0		5.1	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.6	0.0	1.6	3.0	0.0	1.9	2.5	0.0		2.8	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	18.8	0.0	34.9	22.1	0.0	32.8	21.9	18.4		29.5	24.6
LnGrp LOS	C	B		C	C		C	C	B		C	C
Approach Vol, veh/h		654	A		608	A		340				630
Approach Delay, s/veh		21.8			24.2			25.8				25.6
Approach LOS		C			C			C				C

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	17.9	9.5	20.4	8.4	20.8	12.4	17.5
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	35.0	29.0	25.0	23.0	30.0	39.0	23.0	23.0
Max Q Clear Time (g_c+I1), s	7.4	9.7	6.0	13.6	5.3	8.9	8.3	7.9
Green Ext Time (p_c), s	0.5	3.1	0.3	1.7	0.2	3.4	0.5	1.0

Intersection Summary	
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	225
Future Volume (veh/h)	225
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1870
Adj Flow Rate, veh/h	40
Peak Hour Factor	0.91
Percent Heavy Veh, %	2
Cap, veh/h	412
Arrive On Green	0.26
Sat Flow, veh/h	1585
Grp Volume(v), veh/h	40
Grp Sat Flow(s),veh/h/ln	1585
Q Serve(g_s), s	1.1
Cycle Q Clear(g_c), s	1.1
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	412
V/C Ratio(X)	0.10
Avail Cap(c_a), veh/h	617
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	16.6
Incr Delay (d2), s/veh	0.1
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	0.4
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	16.7
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	604	57	65	589	0	69	0	27	0	69	0
Future Volume (veh/h)	0	604	57	65	589	0	69	0	27	0	69	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	0	1870	0	1870	0
Adj Flow Rate, veh/h	0	657	62	71	640	0	75	0	29	0	75	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0	2	0	2	0	2	0
Cap, veh/h	0	1028	97	118	1674	0	159	0	0	0	307	0
Arrive On Green	0.00	0.31	0.31	0.07	0.47	0.00	0.09	0.00	0.00	0.00	0.16	0.00
Sat Flow, veh/h	0	3376	309	1781	3647	0	1781	75		0	1870	0
Grp Volume(v), veh/h	0	355	364	71	640	0	75	21.0		0	75	0
Grp Sat Flow(s),veh/h/ln	0	1777	1815	1781	1777	0	1781	C		0	1870	0
Q Serve(g_s), s	0.0	7.5	7.5	1.7	5.1	0.0	1.7			0.0	1.5	0.0
Cycle Q Clear(g_c), s	0.0	7.5	7.5	1.7	5.1	0.0	1.7			0.0	1.5	0.0
Prop In Lane	0.00		0.17	1.00		0.00	1.00			0.00		0.00
Lane Grp Cap(c), veh/h	0	557	569	118	1674	0	159			0	307	0
V/C Ratio(X)	0.00	0.64	0.64	0.60	0.38	0.00	0.47			0.00	0.24	0.00
Avail Cap(c_a), veh/h	0	1141	1165	653	2118	0	1062			0	901	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00			0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.9	12.9	19.8	7.4	0.0	18.9			0.0	15.9	0.0
Incr Delay (d2), s/veh	0.0	1.2	1.2	4.9	0.1	0.0	2.1			0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.5	2.6	0.8	1.3	0.0	0.7			0.0	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	14.1	14.1	24.7	7.6	0.0	21.0			0.0	16.3	0.0
LnGrp LOS	A	B	B	C	A	A	C			A	B	A
Approach Vol, veh/h		719			711						75	
Approach Delay, s/veh		14.1			9.3						16.3	
Approach LOS		B			A						B	

Timer - Assigned Phs	1	2	3	4		6
Phs Duration (G+Y+Rc), s	6.9	17.7	7.9	11.2		24.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	28.0	26.0	21.0		26.0
Max Q Clear Time (g_c+I1), s	3.7	9.5	3.7	3.5		7.1
Green Ext Time (p_c), s	0.1	4.2	0.2	0.3		4.1

Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	612	20	32	593	3	29	0	25	8	0	24
Future Vol, veh/h	12	612	20	32	593	3	29	0	25	8	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	665	22	35	645	3	32	0	27	9	0	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	645	0	0	687	0	0	1095	1417	344	1074	1428	323
Stage 1	-	-	-	-	-	-	702	702	-	715	715	-
Stage 2	-	-	-	-	-	-	393	715	-	359	713	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	936	-	-	903	-	0	168	136	652	174	134	673
Stage 1	-	-	-	-	-	0	395	439	-	388	433	-
Stage 2	-	-	-	-	-	0	603	433	-	632	434	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	936	-	-	903	-	-	155	129	652	160	127	673
Mov Cap-2 Maneuver	-	-	-	-	-	-	155	129	-	160	127	-
Stage 1	-	-	-	-	-	-	389	433	-	383	416	-
Stage 2	-	-	-	-	-	-	557	416	-	597	428	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.5	23.3	10.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	155	652	936	-	-	903	-	640
HCM Lane V/C Ratio	0.203	0.042	0.014	-	-	0.039	-	0.054
HCM Control Delay (s)	34.1	10.8	8.9	-	-	9.1	-	10.9
HCM Lane LOS	D	B	A	-	-	A	-	B
HCM 95th %tile Q(veh)	0.7	0.1	0	-	-	0.1	-	0.2

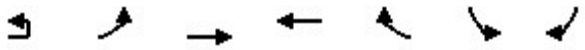
Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	620	25	17	587	41	25
Future Vol, veh/h	620	25	17	587	41	25
Conflicting Peds, #/hr	0	1	2	0	0	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	674	27	18	638	45	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	703	0	1045	358
Stage 1	-	-	-	-	690	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	890	-	224	638
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	681	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	889	-	219	634
Mov Cap-2 Maneuver	-	-	-	-	219	-
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	667	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	20
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	219	634	-	-	889	-
HCM Lane V/C Ratio	0.203	0.043	-	-	0.021	-
HCM Control Delay (s)	25.6	10.9	-	-	9.1	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0.1	-



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	1	40	604	472	69	171	131
Future Volume (veh/h)	1	40	604	472	69	171	131
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00			1.00	1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No	No		No	
Adj Sat Flow, veh/h/ln		1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h		46	694	543	0	197	0
Peak Hour Factor		0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %		3	3	3	3	3	3
Cap, veh/h		73	1904	1362		266	
Arrive On Green		0.04	0.54	0.39	0.00	0.15	0.00
Sat Flow, veh/h		1767	3618	3711	0	1767	1572
Grp Volume(v), veh/h		46	694	543	0	197	0
Grp Sat Flow(s),veh/h/ln		1767	1763	1763	0	1767	1572
Q Serve(g_s), s		0.9	4.0	4.0	0.0	3.8	0.0
Cycle Q Clear(g_c), s		0.9	4.0	4.0	0.0	3.8	0.0
Prop In Lane		1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h		73	1904	1362		266	
V/C Ratio(X)		0.63	0.36	0.40		0.74	
Avail Cap(c_a), veh/h		647	3969	3969		995	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh		16.8	4.7	7.9	0.0	14.4	0.0
Incr Delay (d2), s/veh		8.8	0.3	0.4	0.0	4.0	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.5	0.7	1.0	0.0	1.5	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		25.6	4.9	8.3	0.0	18.5	0.0
LnGrp LOS		C	A	A		B	
Approach Vol, veh/h			740	543	A	197	A
Approach Delay, s/veh			6.2	8.3		18.5	
Approach LOS			A	A		B	

Timer - Assigned Phs	2		4	5	6		
Phs Duration (G+Y+Rc), s	25.2		10.3	5.5	19.7		
Change Period (Y+Rc), s	6.0		5.0	4.0	6.0		
Max Green Setting (Gmax), s	40.0		20.0	13.0	40.0		
Max Q Clear Time (g_c+I1), s	6.0		5.8	2.9	6.0		
Green Ext Time (p_c), s	10.0		0.4	0.0	7.3		

Intersection Summary	
HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	749	26	18	514	0	25	0	58	0	0	2
Future Vol, veh/h	0	749	26	18	514	0	25	0	58	0	0	2
Conflicting Peds, #/hr	0	0	7	0	0	7	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	85	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	832	29	20	571	0	28	0	64	0	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	868	0	0	1180	1472	438	1034	1486	293
Stage 1	-	-	-	-	-	-	854	854	-	618	618	-
Stage 2	-	-	-	-	-	-	326	618	-	416	868	-
Critical Hdwy	-	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	-	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	0	-	-	765	-	-	144	125	564	185	122	700
Stage 1	0	-	-	-	-	-	318	371	-	441	477	-
Stage 2	0	-	-	-	-	-	658	477	-	582	365	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	761	-	-	140	120	561	159	117	696
Mov Cap-2 Maneuver	-	-	-	-	-	-	140	120	-	159	117	-
Stage 1	-	-	-	-	-	-	318	369	-	441	462	-
Stage 2	-	-	-	-	-	-	639	462	-	515	363	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	22.7	10.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	294	-	-	761	-	-	696
HCM Lane V/C Ratio	0.314	-	-	0.026	-	-	0.003
HCM Control Delay (s)	22.7	-	-	9.9	-	-	10.2
HCM Lane LOS	C	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.3	-	-	0.1	-	-	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	699	108	30	385	147	46
Future Volume (veh/h)	699	108	30	385	147	46
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	803	0	34	443	169	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1220		141	988	390	
Arrive On Green	0.34	0.00	0.08	0.53	0.22	0.00
Sat Flow, veh/h	3647	1585	1781	1870	1771	0
Grp Volume(v), veh/h	803	0	34	443	170	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1870	1782	0
Q Serve(g_s), s	7.2	0.0	0.7	5.5	3.1	0.0
Cycle Q Clear(g_c), s	7.2	0.0	0.7	5.5	3.1	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1220		141	988	392	
V/C Ratio(X)	0.66		0.24	0.45	0.43	
Avail Cap(c_a), veh/h	3291		1037	1732	1179	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.5	0.0	16.3	5.5	12.7	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.3	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.2	1.0	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.8	0.0	16.7	5.6	13.0	0.0
LnGrp LOS	B		B	A	B	
Approach Vol, veh/h	803	A		477	170	A
Approach Delay, s/veh	10.8			6.4	13.0	
Approach LOS	B			A	B	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	7.0	18.5				25.5	12.3
Change Period (Y+Rc), s	4.0	5.5				5.5	4.0
Max Green Setting (Gmax), s	22.0	35.0				35.0	25.0
Max Q Clear Time (g_c+I1), s	2.7	9.2				7.5	5.1
Green Ext Time (p_c), s	0.0	3.6				1.6	0.2

Intersection Summary	
HCM 6th Ctrl Delay	9.6
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	618	127	165	320	95	8
Future Volume (veh/h)	618	127	165	320	95	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1900	1900
Adj Flow Rate, veh/h	824	40	220	427	127	6
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	3	3	3	3	0	0
Cap, veh/h	1516	673	319	1305	185	9
Arrive On Green	0.43	0.43	0.18	0.70	0.11	0.11
Sat Flow, veh/h	3618	1565	1767	1856	1666	79
Grp Volume(v), veh/h	824	40	220	427	134	0
Grp Sat Flow(s),veh/h/ln	1763	1565	1767	1856	1758	0
Q Serve(g_s), s	7.5	0.6	5.0	3.8	3.2	0.0
Cycle Q Clear(g_c), s	7.5	0.6	5.0	3.8	3.2	0.0
Prop In Lane		1.00	1.00		0.95	0.04
Lane Grp Cap(c), veh/h	1516	673	319	1305	196	0
V/C Ratio(X)	0.54	0.06	0.69	0.33	0.69	0.00
Avail Cap(c_a), veh/h	3354	1489	1066	1765	1061	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.1	7.2	16.5	2.5	18.4	0.0
Incr Delay (d2), s/veh	0.4	0.1	5.6	0.2	4.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.2	2.1	0.2	1.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.6	7.2	22.1	2.7	22.6	0.0
LnGrp LOS	A	A	C	A	C	A
Approach Vol, veh/h	864			647	134	
Approach Delay, s/veh	9.5			9.3	22.6	
Approach LOS	A			A	C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	31.8	22.5				34.3	8.8
Change Period (Y+Rc), s	4.0	4.0				4.0	4.0
Max Green Setting (Gmax), s	26.0	41.0				41.0	26.0
Max Q Clear Time (g_c+I1), s	7.0	9.5				5.8	5.2
Green Ext Time (p_c), s	1.3	9.0				4.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	56	46	25	34	18
Future Vol, veh/h	14	56	46	25	34	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	18	18	18	18	18	18
Mvmt Flow	17	69	57	31	42	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	198	53	64	0	-	0
Stage 1	53	-	-	-	-	-
Stage 2	145	-	-	-	-	-
Critical Hdwy	6.58	6.38	4.28	-	-	-
Critical Hdwy Stg 1	5.58	-	-	-	-	-
Critical Hdwy Stg 2	5.58	-	-	-	-	-
Follow-up Hdwy	3.662	3.462	2.362	-	-	-
Pot Cap-1 Maneuver	756	971	1442	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	726	971	1442	-	-	-
Mov Cap-2 Maneuver	726	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	4.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1442	-	910	-	-
HCM Lane V/C Ratio	0.039	-	0.095	-	-
HCM Control Delay (s)	7.6	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	EBT	EBR	WBL	WBT	NBU	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	94	1	4	5	1	66	72
Future Vol, veh/h	94	1	4	5	1	66	72
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	-	None
Storage Length	-	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89
Heavy Vehicles, %	15	15	15	15	15	15	15
Mvmt Flow	106	1	4	6	1	74	81

Major/Minor	Major1		Major2		Minor1		
Conflicting Flow All	0	0	107	0	0	121	107
Stage 1	-	-	-	-	0	107	-
Stage 2	-	-	-	-	0	14	-
Critical Hdwy	-	-	4.25	-	-	6.55	6.35
Critical Hdwy Stg 1	-	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.335	-	-	3.635	3.435
Pot Cap-1 Maneuver	-	-	1406	-	0	844	913
Stage 1	-	-	-	-	0	886	-
Stage 2	-	-	-	-	0	976	-
Platoon blocked, %	-	-		-	-		
Mov Cap-1 Maneuver	-	-	1406	-	0	841	913
Mov Cap-2 Maneuver	-	-	-	-	0	841	-
Stage 1	-	-	-	-	0	886	-
Stage 2	-	-	-	-	0	973	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	841	913	-	-	1406	-
HCM Lane V/C Ratio	0.088	0.089	-	-	0.003	-
HCM Control Delay (s)	9.7	9.3	-	-	7.6	0
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	121	6	60	95	5	4
Future Vol, veh/h	121	6	60	95	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	30
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	6	6	6
Mvmt Flow	132	7	65	103	5	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	168	0	-	0	388	117
Stage 1	-	-	-	-	117	-
Stage 2	-	-	-	-	271	-
Critical Hdwy	4.16	-	-	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.254	-	-	-	3.554	3.354
Pot Cap-1 Maneuver	1386	-	-	-	608	924
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	765	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1386	-	-	-	550	924
Mov Cap-2 Maneuver	-	-	-	-	550	-
Stage 1	-	-	-	-	812	-
Stage 2	-	-	-	-	765	-

Approach	EB	WB	SB
HCM Control Delay, s	7.5	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1386	-	-	-	550	924
HCM Lane V/C Ratio	0.095	-	-	-	0.01	0.005
HCM Control Delay (s)	7.9	0	-	-	11.6	8.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0	0

Intersection 9 **Mace Blvd/Alhambra Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	111	110	98.7%	34.5	3.5	C
	Through	470	460	97.9%	11.6	1.9	B
	Right Turn						
	Subtotal	581	570	98.1%	16.1	1.8	B
SB	Left Turn						
	Through	797	790	99.1%	23.9	2.1	C
	Right Turn	32	35	109.4%	9.5	2.2	A
	Subtotal	829	825	99.5%	23.3	2.0	C
EB	Left Turn	15	15	97.3%	44.3	12.1	D
	Through						
	Right Turn	342	341	99.6%	2.9	0.3	A
	Subtotal	357	355	99.5%	4.5	0.5	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,767	1,750	99.0%	17.0	1.3	B

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	3	3	100.0%	11.5	13.4	B
	Through	1	2	160.0%	2.3	7.3	A
	Right Turn	14	17	122.9%	4.1	1.2	A
	Subtotal	18	22	121.1%	6.3	2.4	A
SB	Left Turn	33	32	96.7%	16.3	4.9	B
	Through						
	Right Turn	14	15	106.4%	5.5	3.3	A
	Subtotal	47	47	99.6%	13.2	3.9	B
EB	Left Turn	21	22	106.7%	15.1	5.4	B
	Through	248	249	100.4%	5.6	1.2	A
	Right Turn	10	9	89.0%	3.6	3.1	A
	Subtotal	279	280	100.5%	6.5	1.4	A
WB	Left Turn	82	86	104.6%	17.4	4.6	B
	Through	525	522	99.4%	4.8	1.5	A
	Right Turn	65	71	108.9%	0.9	0.4	A
	Subtotal	672	679	101.0%	6.0	1.5	A
Total		1,016	1,027	101.1%	6.5	1.4	A

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	544	553	101.7%	32.7	14.3	C
	Through	549	540	98.3%	6.2	2.0	A
	Right Turn	24	26	106.7%	2.6	1.5	A
	Subtotal	1,117	1,119	100.2%	19.6	8.5	B
SB	Left Turn	39	37	95.6%	55.1	13.6	E
	Through	1,020	1,006	98.6%	57.6	14.4	E
	Right Turn	72	72	100.6%	24.1	10.3	C
	Subtotal	1,131	1,115	98.6%	55.4	14.2	E
EB	Left Turn	23	21	92.6%	41.8	15.9	D
	Through	18	23	125.0%	38.7	10.0	D
	Right Turn	299	306	102.2%	4.1	0.8	A
	Subtotal	340	349	102.8%	8.7	1.3	A
WB	Left Turn	16	16	101.3%	43.9	12.0	D
	Through	39	40	103.1%	39.8	8.9	D
	Right Turn	12	12	98.3%	18.5	15.3	B
	Subtotal	67	68	101.8%	37.1	6.4	D
Total		2,655	2,652	99.9%	33.9	7.6	C

Intersection 12 **Mace Park and Ride Entrance/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	3	3	90.0%	4.1	2.0	A
	Through						
	Right Turn	1	2	210.0%	4.1	1.8	A
	Subtotal	4	5	120.0%	4.2	3.1	A
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	71	74	104.4%	1.4	0.4	A
	Right Turn	8	9	110.0%	1.0	1.0	A
	Subtotal	79	83	104.9%	1.4	0.3	A
WB	Left Turn	2	2	90.0%	0.6	1.0	A
	Through	64	65	100.9%	0.2	0.2	A
	Right Turn						
	Subtotal	66	66	100.6%	0.3	0.1	A
Total		149	154	103.4%	1.1	0.3	A

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	413	405	98.0%	34.1	5.1	C
	Through	615	610	99.1%	6.7	1.6	A
	Right Turn						
	Subtotal	1,028	1,014	98.6%	17.8	2.2	B
SB	Left Turn						
	Through	1,119	1,112	99.3%	29.2	7.4	C
	Right Turn	216	224	103.5%	13.6	2.3	B
	Subtotal	1,335	1,335	100.0%	26.6	6.5	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	304	311	102.4%	30.2	2.2	C
	Through	3	3	96.7%	7.8	10.6	A
	Right Turn	502	505	100.6%	3.5	0.4	A
	Subtotal	809	819	101.3%	14.0	1.4	B
Total		3,172	3,169	99.9%	20.3	3.1	C

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	9	9	98.9%	39.4	21.3	D
	Through	589	588	99.8%	33.4	3.0	C
	Right Turn	40	43	108.0%	13.5	3.7	B
	Subtotal	638	640	100.3%	32.2	2.9	C
SB	Left Turn	194	205	105.8%	50.8	15.1	D
	Through	302	307	101.7%	22.8	3.2	C
	Right Turn	227	220	96.8%	10.0	3.3	A
	Subtotal	723	732	101.3%	27.9	6.0	C
EB	Left Turn	447	443	99.0%	70.8	27.2	E
	Through	154	155	100.9%	24.7	4.8	C
	Right Turn	148	149	100.6%	1.9	0.2	A
	Subtotal	749	747	99.7%	47.1	17.1	D
WB	Left Turn	29	27	91.7%	36.5	7.1	D
	Through	90	88	97.9%	29.2	5.1	C
	Right Turn	300	301	100.4%	14.3	1.4	B
	Subtotal	419	416	99.3%	19.0	1.4	B
Total		2,529	2,535	100.2%	33.4	5.5	C

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	331	326	98.6%	5.3	1.0	A
	Through						
	Right Turn	75	77	102.4%	2.9	0.6	A
	Subtotal	406	403	99.3%	4.8	0.8	A
EB	Left Turn						
	Through	418	421	100.8%	15.9	4.7	B
	Right Turn						
	Subtotal	418	421	100.8%	15.9	4.7	B
WB	Left Turn						
	Through	326	319	97.8%	10.7	1.6	B
	Right Turn						
	Subtotal	326	319	97.8%	10.7	1.6	B
Total		1,150	1,143	99.4%	10.5	1.9	B

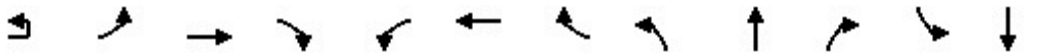
Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	16	14	88.1%	40.1	13.1	D
	Through	281	289	102.8%	23.2	3.2	C
	Right Turn	61	60	97.7%	16.3	3.8	B
	Subtotal	358	363	101.3%	22.6	3.2	C
SB	Left Turn	98	90	91.8%	31.4	5.7	C
	Through	206	205	99.7%	15.2	3.0	B
	Right Turn	28	30	107.5%	6.5	1.6	A
	Subtotal	332	326	98.0%	19.1	2.4	B
EB	Left Turn	132	125	94.5%	27.1	4.8	C
	Through	96	96	99.5%	16.3	4.4	B
	Right Turn	12	13	105.0%	8.7	5.6	A
	Subtotal	240	233	97.0%	21.8	3.5	C
WB	Left Turn	31	30	96.8%	34.5	8.7	C
	Through	79	78	98.6%	22.2	4.5	C
	Right Turn	123	121	98.3%	13.3	4.4	B
	Subtotal	233	229	98.2%	18.8	4.5	B
Total		1,163	1,150	98.8%	20.6	2.6	C

SimTraffic Post-Processor **Aggie Research Campus**
Average Results from 10 Runs **Existing Conditions**
Volume and Delay by Movement **AM Peak Hour**

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	11	12	105.5%	5.1	1.8	A
	Through	238	250	105.0%	9.2	1.0	A
	Right Turn	2	3	140.0%	3.1	3.9	A
	Subtotal	251	264	105.3%	9.0	1.0	A
SB	Left Turn	62	59	95.6%	7.4	1.2	A
	Through	176	174	99.0%	10.2	1.0	B
	Right Turn	11	14	130.9%	5.1	2.2	A
	Subtotal	249	248	99.6%	9.3	0.9	A
EB	Left Turn	23	21	92.6%	4.9	0.5	A
	Through	5	5	100.0%	3.6	2.5	A
	Right Turn	5	6	112.0%	1.9	1.7	A
	Subtotal	33	32	96.7%	4.7	0.4	A
WB	Left Turn	4	3	82.5%	4.0	3.6	A
	Through	11	13	121.8%	6.9	2.7	A
	Right Turn	97	91	94.2%	4.2	1.1	A
	Subtotal	112	108	96.5%	4.6	1.2	A
Total		645	652	101.1%	8.3	0.8	A



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	1	321	617	174	97	480	143	180	319	40	188	289
Future Volume (veh/h)	1	321	617	174	97	480	143	180	319	40	188	289
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		0.94	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No			No			No			No
Adj Sat Flow, veh/h/ln		1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h		338	649	0	102	505	0	189	336	7	198	304
Peak Hour Factor		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h		391	1203		134	692		234	437	347	243	446
Arrive On Green		0.22	0.34	0.00	0.07	0.19	0.00	0.13	0.23	0.23	0.14	0.24
Sat Flow, veh/h		1795	3676	0	1795	3676	0	1795	1885	1497	1795	1885
Grp Volume(v), veh/h		338	649	0	102	505	0	189	336	7	198	304
Grp Sat Flow(s),veh/h/ln		1795	1791	0	1795	1791	0	1795	1885	1497	1795	1885
Q Serve(g_s), s		14.7	11.9	0.0	4.5	10.7	0.0	8.3	13.5	0.3	8.7	11.9
Cycle Q Clear(g_c), s		14.7	11.9	0.0	4.5	10.7	0.0	8.3	13.5	0.3	8.7	11.9
Prop In Lane		1.00		0.00	1.00		0.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h		391	1203		134	692		234	437	347	243	446
V/C Ratio(X)		0.87	0.54		0.76	0.73		0.81	0.77	0.02	0.81	0.68
Avail Cap(c_a), veh/h		776	1724		665	1282		554	535	425	510	535
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		30.6	21.8	0.0	36.8	30.7	0.0	34.2	29.1	24.0	34.0	28.1
Incr Delay (d2), s/veh		5.8	0.4	0.0	8.4	1.5	0.0	6.5	5.4	0.0	6.5	2.7
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		6.7	4.8	0.0	2.2	4.6	0.0	3.9	6.6	0.1	4.1	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		36.4	22.2	0.0	45.2	32.2	0.0	40.7	34.6	24.1	40.5	30.9
LnGrp LOS		D	C		D	C		D	C	C	D	C
Approach Vol, veh/h			987	A		607	A		532			688
Approach Delay, s/veh			27.1			34.4			36.6			32.8
Approach LOS			C			C			D			C

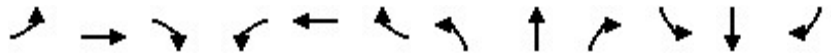
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.6	20.7	14.6	24.2	10.1	32.2	15.0	23.8
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	35.0	29.0	25.0	23.0	30.0	39.0	23.0	23.0
Max Q Clear Time (g_c+I1), s	16.7	12.7	10.3	13.9	6.5	13.9	10.7	15.5
Green Ext Time (p_c), s	0.9	2.9	0.4	1.7	0.2	4.5	0.4	1.2

Intersection Summary	
HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	223
Future Volume (veh/h)	223
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1885
Adj Flow Rate, veh/h	186
Peak Hour Factor	0.95
Percent Heavy Veh, %	1
Cap, veh/h	378
Arrive On Green	0.24
Sat Flow, veh/h	1596
Grp Volume(v), veh/h	186
Grp Sat Flow(s),veh/h/ln	1596
Q Serve(g_s), s	8.2
Cycle Q Clear(g_c), s	8.2
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	378
V/C Ratio(X)	0.49
Avail Cap(c_a), veh/h	453
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	26.7
Incr Delay (d2), s/veh	1.0
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	3.1
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	27.7
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	815	30	37	680	0	40	0	11	0	3	0
Future Volume (veh/h)	0	815	30	37	680	0	40	0	11	0	3	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	0	1870	0	1870	0
Adj Flow Rate, veh/h	0	867	32	39	723	0	43	0	12	0	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	2	2	2	2	0	2	0	2	0	2	0
Cap, veh/h	0	1221	45	74	1667	0	113	0	0	0	437	0
Arrive On Green	0.00	0.35	0.35	0.04	0.47	0.00	0.06	0.00	0.00	0.00	0.23	0.00
Sat Flow, veh/h	0	3585	129	1781	3647	0	1781	43		0	1870	0
Grp Volume(v), veh/h	0	441	458	39	723	0	43	25.2		0	3	0
Grp Sat Flow(s),veh/h/ln	0	1777	1844	1781	1777	0	1781	C		0	1870	0
Q Serve(g_s), s	0.0	11.0	11.0	1.1	7.0	0.0	1.2			0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.0	11.0	11.0	1.1	7.0	0.0	1.2			0.0	0.1	0.0
Prop In Lane	0.00		0.07	1.00		0.00	1.00			0.00		0.00
Lane Grp Cap(c), veh/h	0	621	645	74	1667	0	113			0	437	0
V/C Ratio(X)	0.00	0.71	0.71	0.53	0.43	0.00	0.38			0.00	0.01	0.00
Avail Cap(c_a), veh/h	0	969	1005	555	1799	0	902			0	765	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00			0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	14.4	14.4	24.1	9.1	0.0	23.1			0.0	15.1	0.0
Incr Delay (d2), s/veh	0.0	1.5	1.5	5.7	0.2	0.0	2.1			0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	4.0	0.5	2.1	0.0	0.5			0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	16.0	15.9	29.8	9.3	0.0	25.2			0.0	15.1	0.0
LnGrp LOS	A	B	B	C	A	A	C			A	B	A
Approach Vol, veh/h		899			762						3	
Approach Delay, s/veh		15.9			10.3						15.1	
Approach LOS		B			B						B	

Timer - Assigned Phs	1	2	3	4		6
Phs Duration (G+Y+Rc), s	6.1	22.0	7.3	16.0		28.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	28.0	26.0	21.0		26.0
Max Q Clear Time (g_c+I1), s	3.1	13.0	3.2	2.1		9.0
Green Ext Time (p_c), s	0.0	4.9	0.1	0.0		4.5

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	8	12	779	39	12	688	3	21	1	2	5	0	4
Future Vol, veh/h	8	12	779	39	12	688	3	21	1	2	5	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	Free	-	-	None	-	-	Stop
Storage Length	-	100	-	-	100	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	13	829	41	13	732	3	22	1	2	5	0	4

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	732	732	0	0	870	0	0	1286	1652	435	1217	1672	366
Stage 1	-	-	-	-	-	-	-	894	894	-	758	758	-
Stage 2	-	-	-	-	-	-	-	392	758	-	459	914	-
Critical Hdwy	6.44	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	493	868	-	-	770	-	0	122	98	569	137	95	631
Stage 1	-	-	-	-	-	-	0	302	358	-	365	413	-
Stage 2	-	-	-	-	-	-	0	604	413	-	551	350	-
Platoon blocked, %			-	-		-							
Mov Cap-1 Maneuver	663	663	-	-	770	-	-	117	93	569	130	90	631
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	117	93	-	130	90	-
Stage 1	-	-	-	-	-	-	-	292	347	-	353	406	-
Stage 2	-	-	-	-	-	-	-	590	406	-	530	339	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.2	41	21
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	116	569	663	-	-	770	-	234
HCM Lane V/C Ratio	0.202	0.004	0.032	-	-	0.017	-	0.041
HCM Control Delay (s)	43.7	11.4	10.6	-	-	9.8	-	21
HCM Lane LOS	E	B	B	-	-	A	-	C
HCM 95th %tile Q(veh)	0.7	0	0.1	-	-	0.1	-	0.1

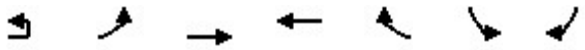
Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	733	53	1	29	663	40	23
Future Vol, veh/h	733	53	1	29	663	40	23
Conflicting Peds, #/hr	0	1	1	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	100	-	0	25
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	780	56	1	31	705	43	24

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	836	837	0	1226	423
Stage 1	-	-	-	-	-	809	-
Stage 2	-	-	-	-	-	417	-
Critical Hdwy	-	-	6.44	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.52	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	423	793	-	171	579
Stage 1	-	-	-	-	-	398	-
Stage 2	-	-	-	-	-	633	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	768	768	-	164	577
Mov Cap-2 Maneuver	-	-	-	-	-	164	-
Stage 1	-	-	-	-	-	398	-
Stage 2	-	-	-	-	-	606	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	26.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	164	577	-	-	768	-
HCM Lane V/C Ratio	0.259	0.042	-	-	0.042	-
HCM Control Delay (s)	34.5	11.5	-	-	9.9	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1	0.1	-	-	0.1	-



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	1	85	671	633	133	116	59
Future Volume (veh/h)	1	85	671	633	133	116	59
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00			1.00	1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No	No		No	
Adj Sat Flow, veh/h/ln		1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		89	699	659	0	121	0
Peak Hour Factor		0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %		2	2	2	2	2	2
Cap, veh/h		115	2161	1548		171	
Arrive On Green		0.06	0.61	0.44	0.00	0.10	0.00
Sat Flow, veh/h		1781	3647	3741	0	1781	1585
Grp Volume(v), veh/h		89	699	659	0	121	0
Grp Sat Flow(s),veh/h/ln		1781	1777	1777	0	1781	1585
Q Serve(g_s), s		1.8	3.6	4.8	0.0	2.4	0.0
Cycle Q Clear(g_c), s		1.8	3.6	4.8	0.0	2.4	0.0
Prop In Lane		1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h		115	2161	1548		171	
V/C Ratio(X)		0.77	0.32	0.43		0.71	
Avail Cap(c_a), veh/h		623	3826	3826		959	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh		17.1	3.6	7.3	0.0	16.3	0.0
Incr Delay (d2), s/veh		10.4	0.2	0.4	0.0	5.3	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.9	0.5	1.1	0.0	1.1	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		27.5	3.7	7.7	0.0	21.6	0.0
LnGrp LOS		C	A	A		C	
Approach Vol, veh/h			788	659	A	121	A
Approach Delay, s/veh			6.4	7.7		21.6	
Approach LOS			A	A		C	

Timer - Assigned Phs	2		4	5	6		
Phs Duration (G+Y+Rc), s	28.6		8.6	6.4	22.2		
Change Period (Y+Rc), s	6.0		5.0	4.0	6.0		
Max Green Setting (Gmax), s	40.0		20.0	13.0	40.0		
Max Q Clear Time (g_c+I1), s	5.6		4.4	3.8	6.8		
Green Ext Time (p_c), s	10.1		0.2	0.1	9.0		

Intersection Summary	
HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	743	44	39	738	0	27	0	16	0	0	1
Future Vol, veh/h	0	743	44	39	738	0	27	0	16	0	0	1
Conflicting Peds, #/hr	0	0	4	0	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	85	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	782	46	41	777	0	28	0	17	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	832	0	0	1280	-	418	1254	1695	393
Stage 1	-	-	-	-	-	-	809	-	-	863	863	-
Stage 2	-	-	-	-	-	-	471	-	-	391	832	-
Critical Hdwy	-	-	-	4.14	-	-	7.54	-	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	-	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	2.22	-	-	3.52	-	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	0	-	-	796	-	-	123	0	584	128	92	606
Stage 1	0	-	-	-	-	-	340	0	-	316	370	-
Stage 2	0	-	-	-	-	-	542	0	-	605	382	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	793	-	-	118	-	582	119	87	604
Mov Cap-2 Maneuver	-	-	-	-	-	-	118	-	-	119	87	-
Stage 1	-	-	-	-	-	-	340	-	-	316	350	-
Stage 2	-	-	-	-	-	-	513	-	-	587	381	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	34.2	11
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	168	-	-	793	-	-	604
HCM Lane V/C Ratio	0.269	-	-	0.052	-	-	0.002
HCM Control Delay (s)	34.2	-	-	9.8	-	-	11
HCM Lane LOS	D	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1	-	-	0.2	-	-	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	614	145	13	644	133	11
Future Volume (veh/h)	614	145	13	644	133	11
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	646	0	14	678	140	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1141		65	901	394	
Arrive On Green	0.32	0.00	0.04	0.48	0.22	0.00
Sat Flow, veh/h	3647	1585	1781	1870	1769	0
Grp Volume(v), veh/h	646	0	14	678	141	0
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1870	1782	0
Q Serve(g_s), s	4.9	0.0	0.2	9.5	2.1	0.0
Cycle Q Clear(g_c), s	4.9	0.0	0.2	9.5	2.1	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1141		65	901	397	
V/C Ratio(X)	0.57		0.22	0.75	0.36	
Avail Cap(c_a), veh/h	3868		1219	2036	1385	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.1	0.0	15.0	6.8	10.5	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.1	1.5	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.2	0.0	15.7	7.3	10.8	0.0
LnGrp LOS	A		B	A	B	
Approach Vol, veh/h	646	A		692	141	A
Approach Delay, s/veh	9.2			7.4	10.8	
Approach LOS	A			A	B	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	5.2	15.8				21.0	11.2
Change Period (Y+Rc), s	4.0	5.5				5.5	4.0
Max Green Setting (Gmax), s	22.0	35.0				35.0	25.0
Max Q Clear Time (g_c+I1), s	2.2	6.9				11.5	4.1
Green Ext Time (p_c), s	0.0	2.8				2.8	0.2

Intersection Summary	
HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	606	19	22	620	37	8
Future Volume (veh/h)	606	19	22	620	37	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	652	12	24	667	40	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	1624	709	66	1207	103	0
Arrive On Green	0.45	0.45	0.04	0.64	0.06	0.00
Sat Flow, veh/h	3676	1564	1795	1885	1754	0
Grp Volume(v), veh/h	652	12	24	667	41	0
Grp Sat Flow(s),veh/h/ln	1791	1564	1795	1885	1797	0
Q Serve(g_s), s	3.2	0.1	0.3	5.2	0.6	0.0
Cycle Q Clear(g_c), s	3.2	0.1	0.3	5.2	0.6	0.0
Prop In Lane		1.00	1.00		0.98	0.00
Lane Grp Cap(c), veh/h	1624	709	66	1207	106	0
V/C Ratio(X)	0.40	0.02	0.36	0.55	0.39	0.00
Avail Cap(c_a), veh/h	5519	2410	1754	2905	1756	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.9	4.0	12.5	2.7	12.1	0.0
Incr Delay (d2), s/veh	0.2	0.0	7.1	0.6	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.2	0.2	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.1	4.0	19.6	3.2	14.4	0.0
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	664			691	41	
Approach Delay, s/veh	5.1			3.8	14.4	
Approach LOS	A			A	B	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	5.0	16.1				21.0	5.6
Change Period (Y+Rc), s	4.0	4.0				4.0	4.0
Max Green Setting (Gmax), s	26.0	41.0				41.0	26.0
Max Q Clear Time (g_c+I1), s	2.3	5.2				7.2	2.6
Green Ext Time (p_c), s	0.1	6.8				7.2	0.1

Intersection Summary	
HCM 6th Ctrl Delay	4.7
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	218	43	56	44	9
Future Vol, veh/h	5	218	43	56	44	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	266	52	68	54	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	232	60	65	0	-	0
Stage 1	60	-	-	-	-	-
Stage 2	172	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	756	1005	1537	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	858	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	730	1005	1537	-	-	-
Mov Cap-2 Maneuver	730	-	-	-	-	-
Stage 1	929	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	3.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1537	-	997	-	-
HCM Lane V/C Ratio	0.034	-	0.273	-	-
HCM Control Delay (s)	7.4	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	265	2	3	6	88	79
Future Vol, veh/h	265	2	3	6	88	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	340	3	4	8	113	101

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	343	0	358	342
Stage 1	-	-	-	-	342	-
Stage 2	-	-	-	-	16	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1216	-	640	701
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	1007	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1216	-	638	701
Mov Cap-2 Maneuver	-	-	-	-	638	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	1004	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	638	701	-	-	1216	-
HCM Lane V/C Ratio	0.177	0.144	-	-	0.003	-
HCM Control Delay (s)	11.9	11	-	-	8	0
HCM Lane LOS	B	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	320	3	73	268	0	2
Future Vol, veh/h	320	3	73	268	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	30
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	348	3	79	291	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	370	0	-	0	924	225
Stage 1	-	-	-	-	225	-
Stage 2	-	-	-	-	699	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1183	-	-	-	298	812
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	491	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1183	-	-	-	210	812
Mov Cap-2 Maneuver	-	-	-	-	210	-
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	491	-

Approach	EB	WB	SB
HCM Control Delay, s	9.2	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1183	-	-	-	-	812
HCM Lane V/C Ratio	0.294	-	-	-	-	0.003
HCM Control Delay (s)	9.3	0	-	-	0	9.4
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	-	-	0

Intersection 9 **Mace Blvd/Alhambra Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	252	253	100.5%	42.8	5.7	D
	Through	609	606	99.5%	14.1	3.1	B
	Right Turn						
	Subtotal	861	859	99.8%	22.8	3.0	C
SB	Left Turn						
	Through	651	652	100.2%	23.8	3.2	C
	Right Turn	23	23	100.0%	7.1	2.5	A
	Subtotal	674	675	100.2%	23.3	3.2	C
EB	Left Turn	12	11	92.5%	37.5	14.0	D
	Through						
	Right Turn	199	195	97.9%	2.1	0.2	A
	Subtotal	211	206	97.6%	4.1	1.1	A
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,746	1,740	99.7%	20.7	2.5	C

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	14	12	87.1%	41.5	9.5	D
	Through	4	4	97.5%	23.6	26.7	C
	Right Turn	33	31	93.0%	7.8	2.4	A
	Subtotal	51	47	91.8%	19.7	5.3	B
SB	Left Turn	172	171	99.3%	22.9	4.6	C
	Through						
	Right Turn	75	74	98.5%	4.9	1.3	A
	Subtotal	247	245	99.1%	17.3	3.0	B
EB	Left Turn	88	87	98.4%	28.5	4.0	C
	Through	610	619	101.4%	13.2	2.0	B
	Right Turn	7	7	101.4%	12.2	9.8	B
	Subtotal	705	712	101.0%	15.2	2.0	B
WB	Left Turn	56	55	98.4%	29.6	6.8	C
	Through	270	269	99.5%	15.1	2.3	B
	Right Turn	120	121	100.9%	3.9	1.0	A
	Subtotal	446	445	99.7%	13.7	2.1	B
Total		1,449	1,449	100.0%	15.2	1.6	B

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	367	371	101.0%	31.6	2.8	C
	Through	716	712	99.5%	21.9	4.6	C
	Right Turn	32	31	98.1%	15.7	4.2	B
	Subtotal	1,115	1,114	99.9%	25.1	3.5	C
SB	Left Turn	98	98	100.0%	48.9	5.8	D
	Through	660	661	100.2%	39.2	3.9	D
	Right Turn	93	90	96.9%	9.5	1.7	A
	Subtotal	851	850	99.8%	37.2	3.1	D
EB	Left Turn	124	122	98.7%	35.0	5.0	C
	Through	113	119	105.0%	29.3	4.7	C
	Right Turn	632	632	100.0%	12.7	2.8	B
	Subtotal	869	873	100.4%	17.9	2.0	B
WB	Left Turn	19	19	98.4%	44.7	11.1	D
	Through	22	19	86.4%	41.2	10.2	D
	Right Turn	41	47	113.4%	11.7	8.4	B
	Subtotal	82	84	102.7%	26.8	9.0	C
Total		2,917	2,921	100.1%	26.6	1.6	C

Intersection 12 **Mace Park and Ride Entrance/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	22	25	111.8%	5.5	1.2	A
	Through						
	Right Turn	12	13	110.8%	2.7	0.8	A
	Subtotal	34	38	111.5%	4.6	1.0	A
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	225	229	102.0%	2.6	0.5	A
	Right Turn	14	15	105.7%	2.3	0.6	A
	Subtotal	239	244	102.2%	2.5	0.5	A
WB	Left Turn	2	1	60.0%	0.3	0.7	A
	Through	60	59	98.8%	0.2	0.2	A
	Right Turn						
	Subtotal	62	61	97.6%	0.2	0.2	A
Total		335	343	102.3%	2.4	0.4	A

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	253	233	92.0%	33.6	8.1	C
	Through	446	430	96.3%	7.0	2.0	A
	Right Turn						
	Subtotal	699	662	94.7%	15.9	3.3	B
SB	Left Turn						
	Through	1,092	1,057	96.8%	100.5	84.3	F
	Right Turn	219	222	101.5%	55.9	55.9	E
	Subtotal	1,311	1,279	97.6%	93.7	80.7	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	387	387	99.9%	30.0	7.5	C
	Through						
	Right Turn	669	682	102.0%	4.3	0.4	A
	Subtotal	1,056	1,069	101.2%	13.3	2.3	B
Total		3,066	3,010	98.2%	47.6	34.2	D

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	24	21	87.5%	96.2	21.6	F
	Through	518	457	88.1%	121.9	24.1	F
	Right Turn	162	140	86.4%	101.5	26.0	F
	Subtotal	704	618	87.7%	117.0	24.1	F
SB	Left Turn	259	246	94.8%	91.7	42.1	F
	Through	430	425	98.8%	43.6	13.7	D
	Right Turn	289	283	97.9%	28.8	13.3	C
	Subtotal	978	953	97.5%	52.3	20.8	D
EB	Left Turn	339	310	91.3%	132.2	52.5	F
	Through	275	264	96.0%	25.7	5.1	C
	Right Turn	85	80	94.0%	2.1	0.5	A
	Subtotal	699	654	93.5%	77.7	31.0	E
WB	Left Turn	46	46	99.8%	36.2	8.4	D
	Through	56	54	95.9%	29.5	6.2	C
	Right Turn	263	261	99.2%	34.7	16.6	C
	Subtotal	365	361	98.8%	34.2	12.3	C
Total		2,746	2,585	94.1%	69.4	6.3	E

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	175	170	97.0%	16.6	13.6	B
	Through						
	Right Turn	29	27	93.8%	3.1	0.7	A
	Subtotal	204	197	96.6%	14.3	10.5	B
EB	Left Turn						
	Through	524	490	93.6%	92.2	131.1	F
	Right Turn						
	Subtotal	524	490	93.6%	92.2	131.1	F
WB	Left Turn						
	Through	369	357	96.8%	8.5	1.3	A
	Right Turn						
	Subtotal	369	357	96.8%	8.5	1.3	A
Total		1,097	1,045	95.2%	41.4	42.9	D

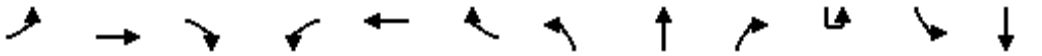
Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	15	15	98.0%	144.0	95.2	F
	Through	358	328	91.7%	168.5	117.6	F
	Right Turn	27	24	87.4%	154.2	109.7	F
	Subtotal	400	367	91.7%	167.1	116.4	F
SB	Left Turn	142	141	99.4%	36.3	8.4	D
	Through	225	215	95.4%	16.4	4.5	B
	Right Turn	67	62	93.0%	6.6	1.5	A
	Subtotal	434	418	96.3%	21.8	4.5	C
EB	Left Turn	119	111	93.1%	53.2	32.2	D
	Through	102	100	98.1%	25.5	15.0	C
	Right Turn	24	25	105.4%	18.9	21.4	B
	Subtotal	245	236	96.4%	37.7	22.6	D
WB	Left Turn	21	20	94.8%	45.5	27.0	D
	Through	47	50	106.8%	42.9	19.4	D
	Right Turn	98	98	100.1%	36.4	21.6	D
	Subtotal	166	168	101.3%	38.7	19.1	D
Total		1,245	1,189	95.5%	67.5	34.0	E

SimTraffic Post-Processor **Aggie Research Campus**
Average Results from 10 Runs **Existing Conditions**
Volume and Delay by Movement **PM Peak Hour**

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	14	12	86.4%	30.4	54.0	D
	Through	329	313	95.2%	54.9	72.3	F
	Right Turn	9	10	108.9%	54.3	72.0	F
	Subtotal	352	335	95.2%	53.8	71.3	F
SB	Left Turn	99	95	96.4%	8.0	1.0	A
	Through	162	156	96.2%	10.1	1.0	B
	Right Turn	9	9	102.2%	5.2	2.0	A
	Subtotal	270	260	96.4%	9.2	1.0	A
EB	Left Turn	4	4	92.5%	2.2	2.8	A
	Through	7	8	114.3%	6.7	4.0	A
	Right Turn	10	11	106.0%	3.5	1.2	A
	Subtotal	21	22	106.2%	4.8	1.2	A
WB	Left Turn	7	7	100.0%	10.0	15.8	A
	Through	14	14	100.7%	15.1	18.8	C
	Right Turn	67	69	102.2%	20.3	26.4	C
	Subtotal	88	90	101.8%	17.8	21.7	C
Total		731	707	96.8%	28.1	30.0	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	153	686	132	93	497	114	114	192	40	2	317	358
Future Volume (veh/h)	153	686	132	93	497	114	114	192	40	2	317	358
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach		No			No			No				No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870		1870	1870
Adj Flow Rate, veh/h	168	754	0	102	546	0	125	211	4		348	393
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91		0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2
Cap, veh/h	214	1053		135	894		163	312	253		398	558
Arrive On Green	0.12	0.30	0.00	0.08	0.25	0.00	0.09	0.17	0.17		0.22	0.30
Sat Flow, veh/h	1781	3647	0	1781	3647	0	1781	1870	1519		1781	1870
Grp Volume(v), veh/h	168	754	0	102	546	0	125	211	4		348	393
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1781	1777	0	1781	1870	1519		1781	1870
Q Serve(g_s), s	6.9	14.3	0.0	4.2	10.3	0.0	5.2	8.0	0.2		14.2	14.1
Cycle Q Clear(g_c), s	6.9	14.3	0.0	4.2	10.3	0.0	5.2	8.0	0.2		14.2	14.1
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00		1.00	
Lane Grp Cap(c), veh/h	214	1053		135	894		163	312	253		398	558
V/C Ratio(X)	0.78	0.72		0.76	0.61		0.77	0.68	0.02		0.88	0.70
Avail Cap(c_a), veh/h	825	1834		707	1364		589	569	462		542	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	32.3	23.8	0.0	34.2	25.0	0.0	33.5	29.6	26.3		28.3	23.5
Incr Delay (d2), s/veh	6.2	0.9	0.0	8.3	0.7	0.0	7.3	2.6	0.0		11.5	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	5.7	0.0	2.1	4.1	0.0	2.5	3.7	0.1		7.1	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	24.7	0.0	42.6	25.7	0.0	40.9	32.1	26.3		39.9	27.4
LnGrp LOS	D	C		D	C		D	C	C		D	C
Approach Vol, veh/h		922	A		648	A		340				781
Approach Delay, s/veh		27.2			28.3			35.3				32.5
Approach LOS		C			C			D				C

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	24.0	10.9	27.5	9.7	27.4	20.9	17.6
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	35.0	29.0	25.0	23.0	30.0	39.0	23.0	23.0
Max Q Clear Time (g_c+I1), s	8.9	12.3	7.2	16.1	6.2	16.3	16.2	10.0
Green Ext Time (p_c), s	0.4	3.2	0.3	1.4	0.2	5.3	0.6	0.9

Intersection Summary	
HCM 6th Ctrl Delay	30.0
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	225
Future Volume (veh/h)	225
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1870
Adj Flow Rate, veh/h	40
Peak Hour Factor	0.91
Percent Heavy Veh, %	2
Cap, veh/h	473
Arrive On Green	0.30
Sat Flow, veh/h	1585
Grp Volume(v), veh/h	40
Grp Sat Flow(s),veh/h/ln	1585
Q Serve(g_s), s	1.4
Cycle Q Clear(g_c), s	1.4
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	473
V/C Ratio(X)	0.08
Avail Cap(c_a), veh/h	483
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	19.1
Incr Delay (d2), s/veh	0.1
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	0.5
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	19.2
LnGrp LOS	B
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	986	57	65	635	0	69	0	27	0	69	0
Future Volume (veh/h)	0	986	57	65	635	0	69	0	27	0	69	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	0	1870	0	1870	0
Adj Flow Rate, veh/h	0	1072	62	71	690	0	75	0	29	0	75	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0	2	0	2	0	2	0
Cap, veh/h	0	1400	81	108	1938	0	143	0	0	0	281	0
Arrive On Green	0.00	0.41	0.41	0.06	0.55	0.00	0.08	0.00	0.00	0.00	0.15	0.00
Sat Flow, veh/h	0	3508	197	1781	3647	0	1781	75		0	1870	0
Grp Volume(v), veh/h	0	558	576	71	690	0	75	26.6		0	75	0
Grp Sat Flow(s),veh/h/ln	0	1777	1835	1781	1777	0	1781	C		0	1870	0
Q Serve(g_s), s	0.0	14.5	14.5	2.1	5.9	0.0	2.2			0.0	1.9	0.0
Cycle Q Clear(g_c), s	0.0	14.5	14.5	2.1	5.9	0.0	2.2			0.0	1.9	0.0
Prop In Lane	0.00		0.11	1.00		0.00	1.00			0.00		0.00
Lane Grp Cap(c), veh/h	0	729	753	108	1938	0	143			0	281	0
V/C Ratio(X)	0.00	0.77	0.77	0.66	0.36	0.00	0.52			0.00	0.27	0.00
Avail Cap(c_a), veh/h	0	927	957	531	1938	0	863			0	732	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00			0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	13.6	13.6	24.7	6.9	0.0	23.7			0.0	20.2	0.0
Incr Delay (d2), s/veh	0.0	2.9	2.9	6.5	0.1	0.0	2.9			0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.2	5.4	1.0	1.6	0.0	1.0			0.0	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	16.6	16.5	31.2	7.0	0.0	26.6			0.0	20.7	0.0
LnGrp LOS	A	B	B	C	A	A	C			A	C	A
Approach Vol, veh/h		1134			761						75	
Approach Delay, s/veh		16.5			9.3						20.7	
Approach LOS		B			A						C	

Timer - Assigned Phs	1	2	3	4		6
Phs Duration (G+Y+Rc), s	7.3	26.0	8.3	12.1		33.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	28.0	26.0	21.0		26.0
Max Q Clear Time (g_c+I1), s	4.1	16.5	4.2	3.9		7.9
Green Ext Time (p_c), s	0.1	5.5	0.2	0.3		4.4

Intersection Summary	
HCM 6th Ctrl Delay	14.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	994	20	32	640	3	29	0	29	8	0	24
Future Vol, veh/h	12	994	20	32	640	3	29	0	29	8	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	Stop
Storage Length	100	-	-	100	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	1080	22	35	696	3	32	0	32	9	0	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	696	0	0	1102	0	0	1535	1883	551	1332	1894	348
Stage 1	-	-	-	-	-	-	1117	1117	-	766	766	-
Stage 2	-	-	-	-	-	-	418	766	-	566	1128	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	896	-	-	629	-	0	79	70	478	112	69	648
Stage 1	-	-	-	-	-	0	221	281	-	361	410	-
Stage 2	-	-	-	-	-	0	583	410	-	476	278	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	896	-	-	629	-	-	72	65	478	99	64	648
Mov Cap-2 Maneuver	-	-	-	-	-	-	72	65	-	99	64	-
Stage 1	-	-	-	-	-	-	218	277	-	356	387	-
Stage 2	-	-	-	-	-	-	528	387	-	438	274	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	51.2	15
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	72	478	896	-	-	629	-	396
HCM Lane V/C Ratio	0.438	0.066	0.015	-	-	0.055	-	0.088
HCM Control Delay (s)	89.3	13.1	9.1	-	-	11.1	-	15
HCM Lane LOS	F	B	A	-	-	B	-	C
HCM 95th %tile Q(veh)	1.7	0.2	0	-	-	0.2	-	0.3

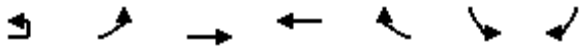
Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1006	25	17	634	41	29
Future Vol, veh/h	1006	25	17	634	41	29
Conflicting Peds, #/hr	0	1	2	0	0	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1093	27	18	689	45	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1122	0	1490	567
Stage 1	-	-	-	-	1109	-
Stage 2	-	-	-	-	381	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	618	-	115	467
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	660	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	617	-	111	464
Mov Cap-2 Maneuver	-	-	-	-	111	-
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	641	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	39.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	111	464	-	-	617	-
HCM Lane V/C Ratio	0.401	0.068	-	-	0.03	-
HCM Control Delay (s)	57.7	13.3	-	-	11	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	1.7	0.2	-	-	0.1	-



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	1	40	994	519	72	188	131
Future Volume (veh/h)	1	40	994	519	72	188	131
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00			1.00	1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No	No		No	
Adj Sat Flow, veh/h/ln		1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h		46	1143	597	0	216	0
Peak Hour Factor		0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %		3	3	3	3	3	3
Cap, veh/h		68	2115	1671		283	
Arrive On Green		0.04	0.60	0.47	0.00	0.16	0.00
Sat Flow, veh/h		1767	3618	3711	0	1767	1572
Grp Volume(v), veh/h		46	1143	597	0	216	0
Grp Sat Flow(s),veh/h/ln		1767	1763	1763	0	1767	1572
Q Serve(g_s), s		1.2	8.8	4.9	0.0	5.4	0.0
Cycle Q Clear(g_c), s		1.2	8.8	4.9	0.0	5.4	0.0
Prop In Lane		1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h		68	2115	1671		283	
V/C Ratio(X)		0.67	0.54	0.36		0.76	
Avail Cap(c_a), veh/h		501	3077	3077		771	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh		21.7	5.4	7.6	0.0	18.4	0.0
Incr Delay (d2), s/veh		10.9	0.5	0.3	0.0	4.3	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.6	1.8	1.3	0.0	2.3	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		32.6	5.9	7.9	0.0	22.7	0.0
LnGrp LOS		C	A	A		C	
Approach Vol, veh/h			1189	597	A	216	A
Approach Delay, s/veh			6.9	7.9		22.7	
Approach LOS			A	A		C	

Timer - Assigned Phs	2		4	5	6		
Phs Duration (G+Y+Rc), s	33.5		12.3	5.8	27.7		
Change Period (Y+Rc), s	6.0		5.0	4.0	6.0		
Max Green Setting (Gmax), s	40.0		20.0	13.0	40.0		
Max Q Clear Time (g_c+I1), s	10.8		7.4	3.2	6.9		
Green Ext Time (p_c), s	16.7		0.5	0.0	8.0		

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1156	26	18	564	0	25	0	63	0	0	2
Future Vol, veh/h	0	1156	26	18	564	0	25	0	63	0	0	2
Conflicting Peds, #/hr	0	0	7	0	0	7	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	85	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	1284	29	20	627	0	28	0	70	0	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	1320	0	0	1660	1980	664	1316	1994	321
Stage 1	-	-	-	-	-	-	1306	1306	-	674	674	-
Stage 2	-	-	-	-	-	-	354	674	-	642	1320	-
Critical Hdwy	-	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	-	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	0	-	-	514	-	-	63	60	401	114	59	672
Stage 1	0	-	-	-	-	-	167	226	-	408	449	-
Stage 2	0	-	-	-	-	-	633	449	-	427	223	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	511	-	-	61	57	399	91	56	668
Mov Cap-2 Maneuver	-	-	-	-	-	-	61	57	-	91	56	-
Stage 1	-	-	-	-	-	-	167	225	-	408	429	-
Stage 2	-	-	-	-	-	-	606	429	-	352	222	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	61.3	10.4
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	155	-	-	511	-	-	668
HCM Lane V/C Ratio	0.631	-	-	0.039	-	-	0.003
HCM Control Delay (s)	61.3	-	-	12.3	-	-	10.4
HCM Lane LOS	F	-	-	B	-	-	B
HCM 95th %tile Q(veh)	3.5	-	-	0.1	-	-	0

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	125	305	25	34	18
Future Vol, veh/h	14	125	305	25	34	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	18	18	18	18	18	18
Mvmt Flow	17	154	377	31	42	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	838	53	64	0	-	0
Stage 1	53	-	-	-	-	-
Stage 2	785	-	-	-	-	-
Critical Hdwy	6.58	6.38	4.28	-	-	-
Critical Hdwy Stg 1	5.58	-	-	-	-	-
Critical Hdwy Stg 2	5.58	-	-	-	-	-
Follow-up Hdwy	3.662	3.462	2.362	-	-	-
Pot Cap-1 Maneuver	316	971	1442	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	423	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	232	971	1442	-	-	-
Mov Cap-2 Maneuver	232	-	-	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	423	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	7.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1442	-	735	-	-
HCM Lane V/C Ratio	0.261	-	0.233	-	-
HCM Control Delay (s)	8.4	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	1.1	-	0.9	-	-

Intersection	
Int Delay, s/veh	9.3

Movement	EBT	EBR	WBL	WBT	NBU	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	163	1	4	5	1	325	72
Future Vol, veh/h	163	1	4	5	1	325	72
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	-	None
Storage Length	-	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89
Heavy Vehicles, %	15	15	15	15	15	15	15
Mvmt Flow	183	1	4	6	1	365	81

Major/Minor	Major1		Major2		Minor1		
Conflicting Flow All	0	0	184	0	0	198	184
Stage 1	-	-	-	-	0	184	-
Stage 2	-	-	-	-	0	14	-
Critical Hdwy	-	-	4.25	-	-	6.55	6.35
Critical Hdwy Stg 1	-	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.335	-	-	3.635	3.435
Pot Cap-1 Maneuver	-	-	1316	-	0	762	826
Stage 1	-	-	-	-	0	817	-
Stage 2	-	-	-	-	0	976	-
Platoon blocked, %	-	-		-	-		
Mov Cap-1 Maneuver	-	-	1316	-	0	760	826
Mov Cap-2 Maneuver	-	-	-	-	0	760	-
Stage 1	-	-	-	-	0	817	-
Stage 2	-	-	-	-	0	973	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	760	826	-	-	1316	-
HCM Lane V/C Ratio	0.48	0.098	-	-	0.003	-
HCM Control Delay (s)	14	9.8	-	-	7.7	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	2.6	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	121	6	60	164	5	4
Future Vol, veh/h	121	6	60	164	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	30
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	6	6	6
Mvmt Flow	132	7	65	178	5	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	243	0	-	0	425	154
Stage 1	-	-	-	-	154	-
Stage 2	-	-	-	-	271	-
Critical Hdwy	4.16	-	-	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.254	-	-	-	3.554	3.354
Pot Cap-1 Maneuver	1300	-	-	-	578	882
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	765	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1300	-	-	-	519	882
Mov Cap-2 Maneuver	-	-	-	-	519	-
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	765	-

Approach	EB	WB	SB
HCM Control Delay, s	7.7	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1300	-	-	-	519	882
HCM Lane V/C Ratio	0.101	-	-	-	0.01	0.005
HCM Control Delay (s)	8.1	0	-	-	12	9.1
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0	0

Intersection 9 **Mace Blvd/Alhambra Blvd-ARC Dwy 1** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	111	85	76.8%	80.0	13.8	E
	Through	620	499	80.4%	70.8	9.6	E
	Right Turn	350	287	82.1%	59.4	10.9	E
	Subtotal	1,081	871	80.6%	68.0	10.7	E
SB	Left Turn	200	161	80.6%	239.2	53.2	F
	Through	763	570	74.8%	265.3	23.4	F
	Right Turn	32	23	72.8%	209.2	57.1	F
	Subtotal	995	755	75.9%	259.1	14.9	F
EB	Left Turn	15	14	90.7%	97.4	56.7	F
	Through	212	212	100.1%	94.2	51.4	F
	Right Turn	400	381	95.2%	113.4	89.5	F
	Subtotal	627	607	96.8%	107.5	74.8	F
WB	Left Turn	182	93	50.9%	637.0	86.9	F
	Through	46	36	78.5%	160.5	127.8	F
	Right Turn	28	22	77.9%	146.4	158.0	F
	Subtotal	256	151	58.8%	482.3	137.8	F
Total		2,959	2,383	80.5%	159.4	20.0	F

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	3	2	76.7%	5.0	11.9	A
	Through	1	1	70.0%	2.4	7.7	A
	Right Turn	14	15	105.0%	3.9	1.0	A
	Subtotal	18	18	98.3%	4.8	2.0	A
SB	Left Turn	36	34	95.0%	19.0	5.9	B
	Through						
	Right Turn	14	14	102.1%	4.7	3.8	A
	Subtotal	50	49	97.0%	15.0	4.6	B
EB	Left Turn	21	19	91.0%	17.5	5.8	B
	Through	308	301	97.8%	5.4	1.4	A
	Right Turn	10	9	90.0%	1.9	1.6	A
	Subtotal	339	329	97.2%	6.1	1.3	A
WB	Left Turn	82	66	80.2%	19.0	4.6	B
	Through	572	483	84.4%	5.5	1.6	A
	Right Turn	77	62	80.5%	0.9	0.4	A
	Subtotal	731	611	83.5%	6.5	1.5	A
Total		1,138	1,006	88.4%	6.8	1.5	A

SimTraffic Post-Processor **Aggie Research Campus**
Average Results from 10 Runs **Existing Plus Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	544	449	82.5%	173.5	22.9	F
	Through	1,017	817	80.4%	184.3	40.8	F
	Right Turn	464	374	80.7%	171.3	36.5	F
	Subtotal	2,025	1,641	81.0%	178.6	34.1	F
SB	Left Turn	63	46	72.4%	160.5	8.6	F
	Through	1,162	871	74.9%	181.8	8.2	F
	Right Turn	112	86	76.8%	128.8	7.5	F
	Subtotal	1,337	1,003	75.0%	176.4	8.4	F
EB	Left Turn	53	45	84.7%	95.1	35.0	F
	Through	51	48	94.7%	46.6	13.0	D
	Right Turn	299	292	97.8%	6.2	1.0	A
	Subtotal	403	386	95.7%	22.8	6.4	C
WB	Left Turn	203	188	92.7%	160.5	82.4	F
	Through	58	58	99.5%	108.0	65.8	F
	Right Turn	14	13	95.0%	107.2	89.4	F
	Subtotal	275	259	94.3%	146.7	80.7	F
Total		4,040	3,288	81.4%	155.3	16.7	F

Intersection 211 **ARC Dwy 4-Mace Park and Ride Entrance/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	14	14	99.3%	13.6	14.5	B
	Through						
	Right Turn	3	3	90.0%	2.2	2.6	A
	Subtotal	17	17	97.6%	12.8	14.8	B
SB	Left Turn	30	34	111.7%	17.0	12.5	C
	Through	2	2	85.0%	1.6	3.6	A
	Right Turn	108	101	93.1%	17.7	20.1	C
	Subtotal	140	136	96.9%	17.7	18.1	C
EB	Left Turn	231	180	78.0%	4.2	0.5	A
	Through	271	223	82.2%	2.3	0.4	A
	Right Turn	74	63	85.7%	1.5	0.4	A
	Subtotal	576	466	81.0%	2.9	0.3	A
WB	Left Turn	14	14	102.1%	3.2	1.5	A
	Through	153	151	98.8%	7.1	10.1	A
	Right Turn	50	54	108.8%	6.0	12.5	A
	Subtotal	217	220	101.3%	6.8	9.9	A
Total		950	839	88.3%	6.2	5.2	A

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	413	323	78.2%	78.3	39.1	E
	Through	1,168	878	75.2%	119.1	62.1	F
	Right Turn						
	Subtotal	1,581	1,201	76.0%	108.7	56.1	F
SB	Left Turn						
	Through	1,311	1,065	81.2%	23.0	3.5	C
	Right Turn	353	282	79.8%	12.3	1.0	B
	Subtotal	1,664	1,347	80.9%	20.7	2.7	C
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	304	297	97.8%	53.8	43.9	D
	Through	3	2	80.0%	5.1	10.7	A
	Right Turn	857	821	95.8%	138.8	78.5	F
	Subtotal	1,164	1,121	96.3%	116.3	67.6	F
Total		4,409	3,669	83.2%	77.6	30.8	E

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	9	9	98.9%	49.5	23.2	D
	Through	640	638	99.7%	46.2	19.8	D
	Right Turn	40	41	101.5%	27.7	19.8	C
	Subtotal	689	688	99.8%	45.2	19.6	D
SB	Left Turn	206	177	85.9%	39.0	8.5	D
	Through	315	280	89.0%	21.3	2.9	C
	Right Turn	258	231	89.5%	7.7	1.0	A
	Subtotal	779	688	88.3%	21.3	2.5	C
EB	Left Turn	929	502	54.0%	173.4	27.5	F
	Through	154	84	54.7%	32.1	9.4	C
	Right Turn	148	82	55.5%	2.2	0.3	A
	Subtotal	1,231	669	54.3%	133.5	21.5	F
WB	Left Turn	29	30	103.8%	47.5	25.8	D
	Through	90	95	105.4%	32.1	13.0	C
	Right Turn	320	326	102.0%	26.2	15.3	C
	Subtotal	439	451	102.8%	28.8	14.1	C
Total		3,138	2,496	79.5%	59.0	8.4	E

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	739	423	57.2%	578.7	38.6	F
	Through						
	Right Turn	75	42	56.3%	498.1	68.9	F
	Subtotal	814	465	57.1%	570.1	37.6	F
EB	Left Turn						
	Through	492	245	49.8%	556.0	36.8	F
	Right Turn						
	Subtotal	492	245	49.8%	556.0	36.8	F
WB	Left Turn						
	Through	357	335	93.7%	14.6	2.0	B
	Right Turn						
	Subtotal	357	335	93.7%	14.6	2.0	B
Total		1,663	1,044	62.8%	383.0	16.8	F

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	16	18	113.1%	34.7	15.7	C
	Through	305	308	100.9%	25.3	6.1	C
	Right Turn	61	63	103.8%	14.1	2.1	B
	Subtotal	382	389	101.9%	24.1	5.6	C
SB	Left Turn	98	80	81.5%	27.4	3.8	C
	Through	208	171	82.0%	13.8	3.6	B
	Right Turn	31	26	83.5%	3.0	0.7	A
	Subtotal	337	276	82.0%	16.6	3.4	B
EB	Left Turn	149	147	98.6%	28.1	9.4	C
	Through	96	95	98.6%	16.9	4.5	B
	Right Turn	12	11	94.2%	6.9	6.2	A
	Subtotal	257	253	98.4%	23.4	7.1	C
WB	Left Turn	31	31	100.3%	32.4	13.7	C
	Through	79	78	98.4%	25.2	6.3	C
	Right Turn	131	134	101.9%	15.2	6.7	B
	Subtotal	241	242	100.5%	20.5	6.1	C
Total		1,217	1,161	95.4%	21.5	4.5	C

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	11	10	92.7%	6.4	1.4	A
	Through	246	252	102.5%	9.2	1.2	A
	Right Turn	2	2	115.0%	3.6	3.2	A
	Subtotal	259	265	102.2%	9.0	1.1	A
SB	Left Turn	62	55	87.9%	7.7	1.4	A
	Through	178	150	84.3%	10.3	1.2	B
	Right Turn	11	10	91.8%	7.4	2.4	A
	Subtotal	251	215	85.5%	9.5	1.1	A
EB	Left Turn	31	29	92.3%	4.7	0.4	A
	Through	5	5	106.0%	3.9	2.8	A
	Right Turn	5	6	118.0%	3.3	1.8	A
	Subtotal	41	40	97.1%	4.7	0.2	A
WB	Left Turn	4	4	90.0%	3.8	3.5	A
	Through	11	9	85.5%	7.9	5.6	A
	Right Turn	105	108	102.9%	5.1	1.9	A
	Subtotal	120	121	100.8%	5.3	2.0	A
Total		671	640	95.4%	8.2	0.9	A

Intersection 7 **Alhambra Blvd/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	147	114	77.3%	17.4	3.7	B
	Through						
	Right Turn	50	40	79.8%	7.4	2.5	A
	Subtotal	197	154	78.0%	14.9	3.8	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	928	914	98.5%	7.8	1.0	A
	Right Turn	291	296	101.8%	5.0	0.5	A
	Subtotal	1,219	1,211	99.3%	7.1	0.8	A
WB	Left Turn	30	24	78.7%	17.4	4.0	B
	Through	435	365	83.9%	8.6	1.3	A
	Right Turn						
	Subtotal	465	389	83.6%	9.2	1.3	A
Total		1,881	1,753	93.2%	8.3	0.8	A

Intersection 8 **Harper Jr High Entrance/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	95	93	97.8%	22.8	6.8	C
	Through						
	Right Turn	8	9	117.5%	18.4	19.7	B
	Subtotal	103	102	99.3%	22.3	7.3	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	851	806	94.7%	62.0	73.6	E
	Right Turn	127	122	96.0%	45.3	70.4	D
	Subtotal	978	928	94.9%	59.8	73.2	E
WB	Left Turn	165	135	81.8%	24.0	4.9	C
	Through	370	296	79.9%	20.6	4.2	C
	Right Turn						
	Subtotal	535	431	80.5%	21.7	3.5	C
Total		1,616	1,461	90.4%	44.8	45.4	D

Intersection 209 **Mace Blvd/ARC Dwy 2** **Signal**

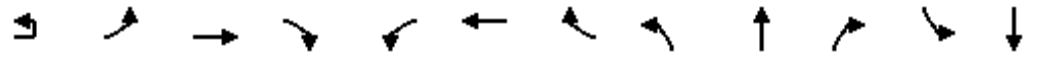
Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	563	454	80.7%	5.7	1.0	A
	Right Turn	100	82	81.5%	5.5	2.2	A
	Subtotal	663	536	80.8%	5.7	0.9	A
SB	Left Turn						
	Through	995	815	81.9%	101.3	10.0	F
	Right Turn						
	Subtotal	995	815	81.9%	101.3	10.0	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	10	12	119.0%	3.2	2.3	A
	Subtotal	10	12	119.0%	3.2	2.3	A
Total		1,668	1,362	81.7%	59.2	4.2	E

Intersection 210 **Mace Blvd/Co Rd 30B-ARC Dwy 3** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	525	426	81.2%	1.3	0.2	A
	Right Turn	48	40	82.9%	0.6	0.3	A
	Subtotal	573	466	81.4%	1.2	0.2	A
SB	Left Turn	71	60	83.8%	208.3	29.6	F
	Through	995	837	84.1%	229.5	22.8	F
	Right Turn						
	Subtotal	1,066	896	84.1%	228.1	22.5	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	10	9	89.0%	4.7	3.0	A
	Subtotal	10	9	89.0%	4.7	3.0	A
Total		1,649	1,371	83.2%	143.3	9.6	F

Intersection 212 **Project Dwy 5/Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	37	35	93.8%	10.9	4.6	B
	Through						
	Right Turn	89	90	101.0%	4.9	1.7	A
	Subtotal	126	125	98.9%	6.5	2.0	A
EB	Left Turn	200	167	83.4%	5.1	0.7	A
	Through	104	91	87.4%	0.8	0.3	A
	Right Turn						
	Subtotal	304	258	84.8%	3.7	0.7	A
WB	Left Turn						
	Through	128	130	101.3%	2.1	0.9	A
	Right Turn	197	197	99.8%	1.1	0.3	A
	Subtotal	325	326	100.4%	1.5	0.5	A
Total		755	709	93.9%	3.1	0.6	A



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	1	321	745	174	100	719	285	180	319	42	202	289
Future Volume (veh/h)	1	321	745	174	100	719	285	180	319	42	202	289
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		0.93	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No			No			No			No
Adj Sat Flow, veh/h/ln		1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h		338	784	0	105	757	0	189	336	9	213	304
Peak Hour Factor		0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h		381	1387		136	899		227	401	317	251	427
Arrive On Green		0.21	0.39	0.00	0.08	0.25	0.00	0.13	0.21	0.21	0.14	0.23
Sat Flow, veh/h		1795	3676	0	1795	3676	0	1795	1885	1490	1795	1885
Grp Volume(v), veh/h		338	784	0	105	757	0	189	336	9	213	304
Grp Sat Flow(s),veh/h/ln		1795	1791	0	1795	1791	0	1795	1885	1490	1795	1885
Q Serve(g_s), s		17.9	16.8	0.0	5.6	19.6	0.0	10.0	16.7	0.5	11.3	14.5
Cycle Q Clear(g_c), s		17.9	16.8	0.0	5.6	19.6	0.0	10.0	16.7	0.5	11.3	14.5
Prop In Lane		1.00		0.00	1.00		0.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h		381	1387		136	899		227	401	317	251	427
V/C Ratio(X)		0.89	0.57		0.77	0.84		0.83	0.84	0.03	0.85	0.71
Avail Cap(c_a), veh/h		643	1429		551	1062		459	443	350	422	443
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		37.4	23.5	0.0	44.4	34.8	0.0	41.7	36.9	30.5	41.0	34.9
Incr Delay (d2), s/veh		8.2	0.5	0.0	9.0	5.5	0.0	7.7	12.2	0.0	8.0	5.1
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		8.5	6.9	0.0	2.8	9.0	0.0	4.9	8.9	0.2	5.5	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		45.6	24.0	0.0	53.3	40.3	0.0	49.3	49.1	30.5	49.0	40.0
LnGrp LOS		D	C		D	D		D	D	C	D	D
Approach Vol, veh/h			1122	A		862	A		534			703
Approach Delay, s/veh			30.5			41.9			48.9			41.2
Approach LOS			C			D			D			D

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.7	29.5	16.4	27.1	11.4	42.9	17.7	25.8
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0
Max Green Setting (Gmax), s	35.0	29.0	25.0	23.0	30.0	39.0	23.0	23.0
Max Q Clear Time (g_c+I1), s	19.9	21.6	12.0	16.5	7.6	18.8	13.3	18.7
Green Ext Time (p_c), s	0.9	2.9	0.4	1.4	0.2	5.3	0.4	0.8

Intersection Summary	
HCM 6th Ctrl Delay	38.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.
Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	223
Future Volume (veh/h)	223
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1885
Adj Flow Rate, veh/h	186
Peak Hour Factor	0.95
Percent Heavy Veh, %	1
Cap, veh/h	361
Arrive On Green	0.23
Sat Flow, veh/h	1595
Grp Volume(v), veh/h	186
Grp Sat Flow(s),veh/h/ln	1595
Q Serve(g_s), s	10.0
Cycle Q Clear(g_c), s	10.0
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	361
V/C Ratio(X)	0.52
Avail Cap(c_a), veh/h	375
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	33.1
Incr Delay (d2), s/veh	1.1
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	3.9
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	34.3
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	959	30	37	1064	0	40	0	11	0	3	0
Future Volume (veh/h)	0	959	30	37	1064	0	40	0	11	0	3	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0	1870	0	1870	0	1870	0
Adj Flow Rate, veh/h	0	1020	32	39	1132	0	43	0	12	0	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	2	2	2	2	0	2	0	2	0	2	0
Cap, veh/h	0	1353	42	73	1774	0	109	0	0	0	411	0
Arrive On Green	0.00	0.38	0.38	0.04	0.50	0.00	0.06	0.00	0.00	0.00	0.22	0.00
Sat Flow, veh/h	0	3608	110	1781	3647	0	1781	43		0	1870	0
Grp Volume(v), veh/h	0	516	536	39	1132	0	43	27.0		0	3	0
Grp Sat Flow(s),veh/h/ln	0	1777	1848	1781	1777	0	1781	C		0	1870	0
Q Serve(g_s), s	0.0	13.7	13.7	1.2	12.8	0.0	1.3			0.0	0.1	0.0
Cycle Q Clear(g_c), s	0.0	13.7	13.7	1.2	12.8	0.0	1.3			0.0	0.1	0.0
Prop In Lane	0.00		0.06	1.00		0.00	1.00			0.00		0.00
Lane Grp Cap(c), veh/h	0	684	711	73	1774	0	109			0	411	0
V/C Ratio(X)	0.00	0.75	0.75	0.54	0.64	0.00	0.39			0.00	0.01	0.00
Avail Cap(c_a), veh/h	0	911	948	522	1774	0	848			0	720	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00			0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	14.5	14.5	25.7	10.0	0.0	24.7			0.0	16.6	0.0
Incr Delay (d2), s/veh	0.0	2.5	2.4	6.0	0.8	0.0	2.3			0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.0	5.2	0.6	3.9	0.0	0.6			0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.1	17.0	31.7	10.8	0.0	27.0			0.0	16.6	0.0
LnGrp LOS	A	B	B	C	B	A	C			A	B	A
Approach Vol, veh/h		1052			1171						3	
Approach Delay, s/veh		17.0			11.5						16.6	
Approach LOS		B			B						B	

Timer - Assigned Phs	1	2	3	4		6
Phs Duration (G+Y+Rc), s	6.2	25.0	7.3	16.0		31.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	16.0	28.0	26.0	21.0		26.0
Max Q Clear Time (g_c+I1), s	3.2	15.7	3.3	2.1		14.8
Green Ext Time (p_c), s	0.0	5.3	0.1	0.0		5.8

Intersection Summary	
HCM 6th Ctrl Delay	14.4
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.5

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	8	12	923	39	16	1079	3	21	1	2	5	0	0
Future Vol, veh/h	8	12	923	39	16	1079	3	21	1	2	5	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	Free	-	-	None	-	-	Stop
Storage Length	-	100	-	-	100	-	-	-	-	50	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	13	982	41	17	1148	3	22	1	2	5	0	0

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	1148	1148	0	0	1023	0	0	1655	2229	512	1718	2249	574
Stage 1	-	-	-	-	-	-	-	1047	1047	-	1182	1182	-
Stage 2	-	-	-	-	-	-	-	608	1182	-	536	1067	-
Critical Hdwy	6.44	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	267	604	-	-	674	-	0	64	42	507	58	41	462
Stage 1	-	-	-	-	-	-	0	244	303	-	201	262	-
Stage 2	-	-	-	-	-	-	0	450	262	-	496	297	-
Platoon blocked, %			-	-		-							
Mov Cap-1 Maneuver	401	401	-	-	674	-	-	60	39	507	53	38	462
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	60	39	-	53	38	-
Stage 1	-	-	-	-	-	-	-	231	287	-	191	255	-
Stage 2	-	-	-	-	-	-	-	439	255	-	466	282	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.2	94.1	80.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	59	507	401	-	-	674	-	53
HCM Lane V/C Ratio	0.397	0.004	0.053	-	-	0.025	-	0.1
HCM Control Delay (s)	101.5	12.1	14.5	-	-	10.5	-	80.4
HCM Lane LOS	F	B	B	-	-	B	-	F
HCM 95th %tile Q(veh)	1.5	0	0.2	-	-	0.1	-	0.3

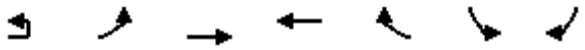
Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	877	53	1	34	1058	40	23
Future Vol, veh/h	877	53	1	34	1058	40	23
Conflicting Peds, #/hr	0	1	1	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	100	-	0	25
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	933	56	1	36	1126	43	24

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	989	990	0	1599	500
Stage 1	-	-	-	-	-	962	-
Stage 2	-	-	-	-	-	637	-
Critical Hdwy	-	-	6.44	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.52	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	337	694	-	97	516
Stage 1	-	-	-	-	-	331	-
Stage 2	-	-	-	-	-	489	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	671	671	-	92	514
Mov Cap-2 Maneuver	-	-	-	-	-	92	-
Stage 1	-	-	-	-	-	331	-
Stage 2	-	-	-	-	-	462	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	51.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	92	514	-	-	671	-
HCM Lane V/C Ratio	0.463	0.048	-	-	0.055	-
HCM Control Delay (s)	74.1	12.4	-	-	10.7	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	2	0.1	-	-	0.2	-



Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	1	85	815	1033	161	119	59
Future Volume (veh/h)	1	85	815	1033	161	119	59
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00			1.00	1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No	No		No	
Adj Sat Flow, veh/h/ln		1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		89	849	1076	0	124	0
Peak Hour Factor		0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %		2	2	2	2	2	2
Cap, veh/h		115	2437	1921		165	
Arrive On Green		0.06	0.69	0.54	0.00	0.09	0.00
Sat Flow, veh/h		1781	3647	3741	0	1781	1585
Grp Volume(v), veh/h		89	849	1076	0	124	0
Grp Sat Flow(s),veh/h/ln		1781	1777	1777	0	1781	1585
Q Serve(g_s), s		2.4	4.9	9.9	0.0	3.4	0.0
Cycle Q Clear(g_c), s		2.4	4.9	9.9	0.0	3.4	0.0
Prop In Lane		1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h		115	2437	1921		165	
V/C Ratio(X)		0.77	0.35	0.56		0.75	
Avail Cap(c_a), veh/h		466	2863	2863		717	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh		22.9	3.2	7.5	0.0	22.0	0.0
Incr Delay (d2), s/veh		10.3	0.2	0.6	0.0	6.7	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.2	0.8	2.5	0.0	1.6	0.0
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		33.2	3.4	8.1	0.0	28.7	0.0
LnGrp LOS		C	A	A		C	
Approach Vol, veh/h			938	1076	A	124	A
Approach Delay, s/veh			6.2	8.1		28.7	
Approach LOS			A	A		C	

Timer - Assigned Phs	2		4	5	6	
Phs Duration (G+Y+Rc), s	40.1		9.6	7.2	32.8	
Change Period (Y+Rc), s	6.0		5.0	4.0	6.0	
Max Green Setting (Gmax), s	40.0		20.0	13.0	40.0	
Max Q Clear Time (g_c+I1), s	6.9		5.4	4.4	11.9	
Green Ext Time (p_c), s	12.6		0.2	0.1	14.9	

Intersection Summary	
HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

Notes

User approved ignoring U-Turning movement.

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	890	44	44	1166	0	27	0	16	0	0	1
Future Vol, veh/h	0	890	44	44	1166	0	27	0	16	0	0	1
Conflicting Peds, #/hr	0	0	4	0	0	4	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	85	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	937	46	46	1227	0	28	0	17	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	987	0	0	1670	2287	496	1792	2310	618
Stage 1	-	-	-	-	-	-	964	964	-	1323	1323	-
Stage 2	-	-	-	-	-	-	706	1323	-	469	987	-
Critical Hdwy	-	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	0	-	-	696	-	-	63	39	519	51	38	432
Stage 1	0	-	-	-	-	-	274	332	-	165	224	-
Stage 2	0	-	-	-	-	-	393	224	-	544	324	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	694	-	-	59	36	517	47	35	431
Mov Cap-2 Maneuver	-	-	-	-	-	-	59	36	-	47	35	-
Stage 1	-	-	-	-	-	-	274	331	-	165	209	-
Stage 2	-	-	-	-	-	-	366	209	-	526	323	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	83	13.4
HCM LOS			F	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	88	-	-	694	-	-	431
HCM Lane V/C Ratio	0.514	-	-	0.067	-	-	0.002
HCM Control Delay (s)	83	-	-	10.6	-	-	13.4
HCM Lane LOS	F	-	-	B	-	-	B
HCM 95th %tile Q(veh)	2.2	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	22

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	714	128	56	44	9
Future Vol, veh/h	5	714	128	56	44	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	871	156	68	54	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	440	60	65	0	-	0
Stage 1	60	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	574	1005	1537	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	514	1005	1537	-	-	-
Mov Cap-2 Maneuver	514	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	691	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.9	5.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1537	-	998	-	-
HCM Lane V/C Ratio	0.102	-	0.879	-	-
HCM Control Delay (s)	7.6	0	27.9	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.3	-	12.1	-	-

Intersection	
Int Delay, s/veh	11.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	761	2	3	6	173	79
Future Vol, veh/h	761	2	3	6	173	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	976	3	4	8	222	101

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	979	0	994	978
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	16	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	705	-	272	304
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	1007	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	705	-	270	304
Mov Cap-2 Maneuver	-	-	-	-	270	-
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	1001	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	47.6
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	270	304	-	-	705	-
HCM Lane V/C Ratio	0.821	0.333	-	-	0.005	-
HCM Control Delay (s)	59	22.6	-	-	10.1	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	6.6	1.4	-	-	0	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	320	3	73	764	0	2
Future Vol, veh/h	320	3	73	764	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	30
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	348	3	79	830	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	909	0	-	0	1193	494
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	699	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	745	-	-	-	206	573
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	491	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	745	-	-	-	110	573
Mov Cap-2 Maneuver	-	-	-	-	110	-
Stage 1	-	-	-	-	325	-
Stage 2	-	-	-	-	491	-

Approach	EB	WB	SB
HCM Control Delay, s	13.9	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	745	-	-	-	-	573
HCM Lane V/C Ratio	0.467	-	-	-	-	0.004
HCM Control Delay (s)	14	0	-	-	0	11.3
HCM Lane LOS	B	A	-	-	A	B
HCM 95th %tile Q(veh)	2.5	-	-	-	-	0

Intersection 9 **Mace Blvd/Alhambra Blvd-ARC Dwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	258	227	87.9%	64.4	11.9	E
	Through	766	677	88.4%	43.2	6.5	D
	Right Turn	130	117	89.6%	37.3	7.7	D
	Subtotal	1,154	1,021	88.4%	47.1	6.2	D
SB	Left Turn	70	61	87.1%	379.7	204.4	F
	Through	706	594	84.2%	417.5	223.8	F
	Right Turn	23	18	79.1%	350.8	230.5	F
	Subtotal	799	673	84.3%	411.2	219.7	F
EB	Left Turn	12	9	78.3%	59.6	24.2	E
	Through	100	104	103.5%	52.5	11.5	D
	Right Turn	220	222	100.9%	28.4	39.0	C
	Subtotal	332	335	100.9%	38.9	26.4	D
WB	Left Turn	350	238	68.0%	538.4	208.0	F
	Through	143	121	84.7%	164.6	121.9	F
	Right Turn	150	125	83.1%	167.3	148.9	F
	Subtotal	643	484	75.2%	328.8	180.0	F
Total		2,928	2,513	85.8%	166.1	53.4	F

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	14	12	85.7%	24.8	17.2	C
	Through	4	3	80.0%	17.5	26.5	B
	Right Turn	33	31	93.9%	26.3	30.8	C
	Subtotal	51	46	90.6%	28.5	22.8	C
SB	Left Turn	189	187	98.7%	54.9	52.0	D
	Through						
	Right Turn	75	72	95.3%	5.2	3.1	A
	Subtotal	264	258	97.8%	41.4	40.3	D
EB	Left Turn	88	83	93.8%	64.6	80.8	E
	Through	685	650	94.9%	77.4	129.2	E
	Right Turn	7	7	102.9%	104.3	181.7	F
	Subtotal	780	740	94.9%	77.4	127.3	E
WB	Left Turn	56	51	91.8%	55.9	48.3	E
	Through	336	310	92.2%	22.0	5.0	C
	Right Turn	126	115	91.1%	7.8	1.6	A
	Subtotal	518	476	91.9%	21.6	7.6	C
Total		1,613	1,520	94.3%	40.9	39.5	D

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	367	357	97.2%	100.5	66.1	F
	Through	916	861	94.0%	118.9	79.9	F
	Right Turn	133	132	99.2%	111.9	79.7	F
	Subtotal	1,416	1,350	95.4%	113.6	76.7	F
SB	Left Turn	161	133	82.4%	179.1	30.2	F
	Through	953	767	80.5%	196.1	39.9	F
	Right Turn	163	134	81.9%	129.3	29.1	F
	Subtotal	1,277	1,033	80.9%	185.3	37.3	F
EB	Left Turn	154	133	86.4%	268.8	189.8	F
	Through	175	166	95.0%	172.3	117.5	F
	Right Turn	632	580	91.8%	83.2	49.6	F
	Subtotal	961	879	91.5%	131.1	63.8	F
WB	Left Turn	425	212	49.9%	246.7	67.2	F
	Through	24	13	52.9%	183.7	63.1	F
	Right Turn	104	47	44.7%	188.8	62.1	F
	Subtotal	553	271	49.0%	235.9	66.5	F
Total		4,207	3,534	84.0%	145.2	39.9	F

Intersection 211 **ARC Dwy 4/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	76	23	29.7%	590.6	191.7	F
	Through	1	1	50.0%	200.8	338.8	F
	Right Turn	26	7	26.2%	604.7	165.4	F
	Subtotal	103	30	29.0%	413.7	231.8	F
SB	Left Turn	180	20	11.1%	604.7	187.0	F
	Through						
	Right Turn	220	23	10.3%	611.5	154.3	F
	Subtotal	400	43	10.7%	608.5	164.9	F
EB	Left Turn	91	85	93.2%	5.3	1.8	A
	Through	349	317	90.9%	3.0	0.5	A
	Right Turn	25	25	98.0%	2.0	0.6	A
	Subtotal	465	427	91.7%	3.4	0.5	A
WB	Left Turn	4	3	75.0%	27.0	45.8	D
	Through	257	225	87.6%	152.6	110.2	F
	Right Turn	40	41	102.0%	155.0	117.8	F
	Subtotal	301	269	89.4%	152.6	111.0	F
Total		1,269	768	60.5%	106.8	21.0	F

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	253	220	87.1%	41.3	6.5	D
	Through	620	574	92.5%	13.5	12.1	B
	Right Turn						
	Subtotal	873	794	90.9%	22.0	7.6	C
SB	Left Turn						
	Through	1,410	1,052	74.6%	144.6	58.4	F
	Right Turn	600	461	76.9%	80.6	39.5	F
	Subtotal	2,010	1,514	75.3%	125.6	53.7	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	387	395	102.1%	36.1	4.7	D
	Through						
	Right Turn	796	800	100.5%	33.4	59.2	C
	Subtotal	1,183	1,195	101.0%	34.2	39.3	C
Total		4,066	3,503	86.1%	70.4	25.5	E

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	24	22	92.1%	91.6	15.0	F
	Through	546	484	88.7%	118.2	15.3	F
	Right Turn	162	141	86.8%	98.5	26.1	F
	Subtotal	732	647	88.4%	113.2	17.5	F
SB	Left Turn	282	238	84.5%	91.0	16.7	F
	Through	485	402	82.9%	47.8	4.1	D
	Right Turn	369	308	83.6%	35.2	3.7	D
	Subtotal	1,136	949	83.5%	54.3	6.0	D
EB	Left Turn	462	388	84.0%	155.1	27.3	F
	Through	275	237	86.1%	31.3	7.2	C
	Right Turn	85	74	86.6%	2.2	0.3	A
	Subtotal	822	699	85.0%	98.0	17.9	F
WB	Left Turn	46	47	101.3%	52.4	33.7	D
	Through	56	58	102.9%	35.5	14.1	D
	Right Turn	286	282	98.7%	54.7	50.4	D
	Subtotal	388	387	99.6%	52.3	44.2	D
Total		3,078	2,681	87.1%	77.1	8.6	E

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	226	216	95.7%	49.3	33.0	D
	Through						
	Right Turn	29	27	92.4%	4.4	2.3	A
	Subtotal	255	243	95.3%	45.7	31.3	D
EB	Left Turn						
	Through	596	485	81.4%	321.0	148.7	F
	Right Turn						
	Subtotal	596	485	81.4%	321.0	148.7	F
WB	Left Turn						
	Through	449	390	86.8%	12.1	2.3	B
	Right Turn						
	Subtotal	449	390	86.8%	12.1	2.3	B
Total		1,300	1,118	86.0%	131.3	53.9	F

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	15	15	98.7%	143.3	107.3	F
	Through	369	347	93.9%	151.5	104.5	F
	Right Turn	27	24	89.3%	143.0	108.3	F
	Subtotal	411	386	93.8%	150.3	104.0	F
SB	Left Turn	150	127	84.4%	35.3	5.9	D
	Through	249	215	86.4%	17.7	3.7	B
	Right Turn	85	69	81.4%	6.8	2.0	A
	Subtotal	484	411	84.9%	21.5	2.3	C
EB	Left Turn	122	112	92.0%	51.8	25.2	D
	Through	102	103	100.9%	23.5	13.0	C
	Right Turn	24	26	107.1%	10.0	6.6	B
	Subtotal	248	241	97.1%	34.7	17.6	C
WB	Left Turn	21	18	86.2%	42.5	10.3	D
	Through	47	49	103.4%	40.2	30.0	D
	Right Turn	100	92	92.3%	39.6	28.4	D
	Subtotal	168	159	94.6%	41.0	24.9	D
Total		1,311	1,196	91.3%	65.1	33.1	E

SimTraffic Post-Processor **Aggie Research Campus**
Average Results from 10 Runs **Existing + Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	14	13	92.9%	38.6	45.8	E
	Through	338	334	98.8%	58.1	59.1	F
	Right Turn	9	9	95.6%	51.4	61.8	F
	Subtotal	361	355	98.4%	57.3	58.4	F
SB	Left Turn	107	95	88.5%	9.0	1.9	A
	Through	170	150	88.2%	10.2	0.8	B
	Right Turn	17	14	80.6%	6.0	1.9	A
	Subtotal	294	258	87.9%	9.5	1.0	A
EB	Left Turn	5	4	88.0%	17.5	44.4	C
	Through	7	7	98.6%	2.7	2.9	A
	Right Turn	10	12	116.0%	3.4	1.3	A
	Subtotal	22	23	104.1%	6.0	7.2	A
WB	Left Turn	7	5	77.1%	19.3	27.4	C
	Through	14	14	99.3%	22.8	39.3	C
	Right Turn	68	67	98.1%	19.5	18.3	C
	Subtotal	89	86	96.6%	20.5	19.7	C
Total		766	723	94.3%	34.3	31.8	D

Intersection 7 **Alhambra Blvd/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	133	115	86.3%	16.0	2.7	B
	Through						
	Right Turn	11	9	84.5%	6.0	4.1	A
	Subtotal	144	124	86.2%	15.1	2.5	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	691	693	100.3%	8.6	0.9	A
	Right Turn	215	216	100.2%	6.5	0.3	A
	Subtotal	906	908	100.3%	8.1	0.7	A
WB	Left Turn	17	15	88.2%	24.7	10.6	C
	Through	1,077	958	89.0%	18.9	5.9	B
	Right Turn						
	Subtotal	1,094	973	88.9%	19.0	5.8	B
Total		2,144	2,006	93.5%	13.8	3.1	B

SimTraffic Post-Processor **Aggie Research Campus**
Average Results from 10 Runs **Existing + Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 8 **Harper Jr High Dwy/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	37	36	95.9%	18.4	3.1	B
	Through						
	Right Turn	8	11	136.3%	4.4	3.7	A
	Subtotal	45	46	103.1%	15.0	2.6	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	683	680	99.5%	6.4	0.6	A
	Right Turn	19	20	107.4%	3.8	2.5	A
	Subtotal	702	700	99.7%	6.3	0.6	A
WB	Left Turn	22	20	90.5%	30.7	7.2	C
	Through	1,057	934	88.3%	19.1	2.8	B
	Right Turn						
	Subtotal	1,079	954	88.4%	19.3	2.9	B
Total		1,826	1,700	93.1%	14.0	1.6	B

Intersection 209 **Mace Blvd/ARC Dwy 2** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	848	738	87.0%	7.3	1.4	A
	Right Turn	80	75	93.6%	6.0	3.0	A
	Subtotal	928	813	87.6%	7.2	1.3	A
SB	Left Turn						
	Through	799	726	90.8%	68.6	49.3	F
	Right Turn						
	Subtotal	799	726	90.8%	68.6	49.3	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	130	129	99.0%	12.6	2.8	B
	Subtotal	130	129	99.0%	12.6	2.8	B
Total		1,857	1,667	89.8%	32.0	18.9	D

Intersection 210 **Mace Blvd/Co Rd 30B-Arc Dwy 3** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	958	847	88.4%	1.4	0.3	A
	Right Turn	20	20	101.5%	0.8	0.3	A
	Subtotal	978	867	88.7%	1.4	0.3	A
SB	Left Turn	24	23	94.6%	91.4	102.2	F
	Through	727	685	94.3%	103.1	110.9	F
	Right Turn						
	Subtotal	751	708	94.3%	102.8	110.6	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	72	58	80.8%	325.3	300.8	F
	Through						
	Right Turn	100	82	82.4%	306.1	292.0	F
	Subtotal	172	141	81.7%	315.7	295.1	F
Total		1,901	1,716	90.3%	54.8	49.6	F

Intersection 212 **ARC Dwy 5/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	243	207	85.1%	177.2	186.2	F
	Through						
	Right Turn	197	167	84.6%	156.0	162.9	F
	Subtotal	440	374	84.9%	167.7	175.3	F
EB	Left Turn	65	42	64.0%	2.6	0.5	A
	Through	490	304	62.0%	1.0	0.2	A
	Right Turn						
	Subtotal	555	345	62.2%	1.2	0.3	A
WB	Left Turn						
	Through	104	103	98.9%	19.7	23.1	C
	Right Turn	43	45	104.0%	11.5	14.1	B
	Subtotal	147	148	100.4%	17.7	21.0	C
Total		1,142	867	75.9%	55.8	43.4	F

Intersection 9 **Mace Blvd/Alhambra Blvd-ARC Dwy 1** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	111	107	96.5%	51.9	6.7	D
	Through	620	601	96.9%	15.8	5.6	B
	Right Turn	350	343	97.9%	7.7	2.3	A
	Subtotal	1,081	1,051	97.2%	17.1	4.1	B
SB	Left Turn	200	199	99.4%	77.5	22.4	E
	Through	763	770	100.9%	24.8	8.6	C
	Right Turn	32	36	111.3%	7.7	5.1	A
	Subtotal	995	1,004	100.9%	34.7	10.9	C
EB	Left Turn	15	13	89.3%	46.9	21.8	D
	Through	212	207	97.4%	46.2	4.8	D
	Right Turn	400	400	100.1%	5.4	1.1	A
	Subtotal	627	620	98.9%	19.8	1.9	B
WB	Left Turn	182	177	97.3%	61.5	38.0	E
	Through	46	45	97.4%	28.1	6.1	C
	Right Turn	28	29	101.8%	2.4	1.0	A
	Subtotal	256	250	97.8%	49.1	25.8	D
Total		2,959	2,925	98.9%	26.4	6.8	C

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	3	3	83.3%	9.6	14.0	A
	Through	1	1	90.0%	0.0	0.0	A
	Right Turn	14	16	111.4%	4.0	0.8	A
	Subtotal	18	19	105.6%	7.2	5.9	A
SB	Left Turn	36	36	99.4%	22.9	7.0	C
	Through						
	Right Turn	14	15	105.0%	5.0	4.3	A
	Subtotal	50	51	101.0%	18.0	3.3	B
EB	Left Turn	21	21	99.5%	19.0	5.6	B
	Through	308	305	98.9%	5.1	1.3	A
	Right Turn	10	11	113.0%	2.1	2.3	A
	Subtotal	339	337	99.4%	5.9	1.4	A
WB	Left Turn	82	81	99.0%	19.1	3.7	B
	Through	572	567	99.1%	6.2	1.7	A
	Right Turn	77	77	99.7%	1.2	0.5	A
	Subtotal	731	725	99.2%	7.2	1.5	A
Total		1,138	1,131	99.4%	7.3	1.2	A

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	544	540	99.3%	52.5	10.3	D
	Through	1,017	986	97.0%	58.2	18.5	E
	Right Turn	464	459	98.9%	92.9	29.0	F
	Subtotal	2,025	1,985	98.0%	64.7	16.5	E
SB	Left Turn	63	60	95.2%	74.1	21.6	E
	Through	1,162	1,158	99.6%	69.8	23.7	E
	Right Turn	112	113	101.2%	39.5	21.1	D
	Subtotal	1,337	1,331	99.6%	67.5	23.5	E
EB	Left Turn	53	50	95.1%	47.8	8.1	D
	Through	51	51	100.4%	46.6	13.4	D
	Right Turn	299	300	100.2%	11.6	3.2	B
	Subtotal	403	401	99.6%	20.4	3.0	C
WB	Left Turn	203	203	100.0%	45.0	4.3	D
	Through	58	55	95.3%	40.8	7.7	D
	Right Turn	14	13	95.0%	13.3	11.3	B
	Subtotal	275	272	98.7%	43.0	3.0	D
Total		4,040	3,989	98.7%	60.2	6.9	E

Intersection 12 **ARC Dwy 4-Mace Park and Ride Entrance/Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	14	14	97.1%	18.4	10.6	B
	Through						
	Right Turn	3	4	140.0%	1.5	2.5	A
	Subtotal	17	18	104.7%	16.2	10.8	B
SB	Left Turn	30	28	93.7%	23.8	7.1	C
	Through	2	2	110.0%	1.9	5.6	A
	Right Turn	108	108	99.6%	3.7	0.6	A
	Subtotal	140	138	98.5%	8.0	2.4	A
EB	Left Turn	231	229	99.2%	21.1	3.1	C
	Through	271	267	98.5%	9.7	1.7	A
	Right Turn	74	72	97.8%	5.3	1.5	A
	Subtotal	576	568	98.7%	14.0	2.1	B
WB	Left Turn	14	15	107.1%	40.4	7.5	D
	Through	153	149	97.4%	29.8	4.3	C
	Right Turn	50	49	98.2%	22.5	4.5	C
	Subtotal	217	213	98.2%	29.0	3.9	C
Total		950	937	98.7%	16.8	1.8	B

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	413	407	98.6%	38.8	4.9	D
	Through	1,168	1,141	97.7%	22.9	15.8	C
	Right Turn						
	Subtotal	1,581	1,549	97.9%	27.3	12.1	C
SB	Left Turn						
	Through	1,311	1,288	98.3%	91.8	41.0	F
	Right Turn	353	350	99.0%	18.0	13.2	B
	Subtotal	1,664	1,638	98.4%	76.2	35.2	E
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	304	291	95.8%	41.1	19.3	D
	Through	3	2	60.0%	7.4	15.7	A
	Right Turn	857	843	98.3%	53.6	78.0	D
	Subtotal	1,164	1,136	97.6%	50.7	62.9	D
Total		4,409	4,322	98.0%	51.1	19.3	D

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	9	9	95.6%	100.7	26.1	F
	Through	640	622	97.2%	86.8	6.2	F
	Right Turn	40	39	97.5%	62.8	11.5	E
	Subtotal	689	669	97.2%	85.8	6.0	F
SB	Left Turn	206	195	94.5%	110.4	46.6	F
	Through	315	304	96.3%	41.3	7.2	D
	Right Turn	258	248	96.0%	15.6	4.1	B
	Subtotal	779	746	95.8%	51.7	17.0	D
EB	Left Turn	929	914	98.4%	36.5	4.0	D
	Through	154	149	96.9%	38.9	6.5	D
	Right Turn	148	151	102.2%	1.8	0.1	A
	Subtotal	1,231	1,214	98.6%	32.3	3.3	C
WB	Left Turn	29	27	91.7%	38.6	12.9	D
	Through	90	88	97.6%	45.5	6.1	D
	Right Turn	327	328	100.4%	29.3	3.7	C
	Subtotal	446	443	99.3%	32.9	2.8	C
Total		3,145	3,072	97.7%	49.7	4.5	D

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	739	727	98.4%	14.3	1.7	B
	Through						
	Right Turn	75	85	113.5%	8.9	1.3	A
	Subtotal	814	812	99.8%	13.8	1.6	B
EB	Left Turn						
	Through	492	485	98.5%	42.4	11.7	D
	Right Turn						
	Subtotal	492	485	98.5%	42.4	11.7	D
WB	Left Turn						
	Through	357	344	96.4%	17.5	3.5	B
	Right Turn						
	Subtotal	357	344	96.4%	17.5	3.5	B
Total		1,663	1,641	98.7%	23.0	3.9	C

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	16	17	106.3%	48.1	28.2	D
	Through	305	308	101.0%	70.0	49.9	E
	Right Turn	61	64	104.8%	62.6	50.1	E
	Subtotal	382	389	101.8%	67.7	48.1	E
SB	Left Turn	98	95	97.1%	35.2	5.7	D
	Through	208	202	97.2%	14.1	3.3	B
	Right Turn	31	31	101.0%	3.6	2.9	A
	Subtotal	337	329	97.5%	19.9	3.8	B
EB	Left Turn	149	149	100.1%	34.9	10.3	C
	Through	96	100	103.9%	20.4	4.1	C
	Right Turn	12	13	111.7%	16.0	11.6	B
	Subtotal	257	262	102.0%	28.8	7.3	C
WB	Left Turn	31	33	105.8%	38.6	18.4	D
	Through	79	81	102.8%	31.7	13.8	C
	Right Turn	131	136	103.5%	21.5	10.6	C
	Subtotal	241	250	103.6%	27.0	11.7	C
Total		1,217	1,229	101.0%	38.4	18.3	D

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	11	12	109.1%	5.9	0.5	A
	Through	246	248	100.8%	11.1	6.2	B
	Right Turn	2	1	70.0%	1.3	1.6	A
	Subtotal	259	261	100.9%	10.8	6.1	B
SB	Left Turn	62	62	100.2%	8.3	0.6	A
	Through	178	176	98.9%	10.6	1.0	B
	Right Turn	11	10	87.3%	7.1	2.6	A
	Subtotal	251	248	98.7%	9.9	0.8	A
EB	Left Turn	31	32	102.9%	5.8	3.1	A
	Through	5	4	88.0%	3.5	4.4	A
	Right Turn	5	6	112.0%	2.1	1.7	A
	Subtotal	41	42	102.2%	5.7	3.0	A
WB	Left Turn	4	4	87.5%	4.7	3.0	A
	Through	11	12	110.0%	7.7	8.8	A
	Right Turn	105	109	103.4%	6.1	5.5	A
	Subtotal	120	124	103.5%	6.2	5.5	A
Total		671	675	100.6%	9.5	3.7	A

Intersection 7 **Alhambra Blvd/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	147	143	97.0%	17.1	2.5	B
	Through						
	Right Turn	50	51	102.2%	7.9	2.2	A
	Subtotal	197	194	98.3%	15.1	2.1	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	928	936	100.8%	9.0	1.4	A
	Right Turn	291	293	100.8%	5.3	0.2	A
	Subtotal	1,219	1,229	100.8%	8.1	1.0	A
WB	Left Turn	30	27	88.3%	23.5	4.5	C
	Through	435	429	98.5%	10.1	1.2	B
	Right Turn						
	Subtotal	465	455	97.9%	10.9	1.2	B
Total		1,881	1,878	99.8%	9.5	0.9	A

Intersection 8 **Harper Jr High Entrance/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	95	99	103.8%	22.3	3.5	C
	Through						
	Right Turn	8	11	132.5%	11.3	16.7	B
	Subtotal	103	109	106.0%	21.8	3.9	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	851	852	100.1%	12.8	1.2	B
	Right Turn	127	134	105.5%	9.1	1.5	A
	Subtotal	978	986	100.8%	12.3	1.2	B
WB	Left Turn	165	158	95.6%	27.2	3.7	C
	Through	370	357	96.5%	23.8	5.5	C
	Right Turn						
	Subtotal	535	515	96.2%	24.9	3.6	C
Total		1,616	1,610	99.6%	16.8	0.9	B

Intersection 209 **Mace Blvd/ARC Dwy 2** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	563	543	96.4%	3.6	0.6	A
	Right Turn	100	99	99.0%	4.2	1.6	A
	Subtotal	663	642	96.8%	3.7	0.7	A
SB	Left Turn						
	Through	995	1,005	101.0%	2.5	0.3	A
	Right Turn						
	Subtotal	995	1,005	101.0%	2.5	0.3	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	10	9	89.0%	4.1	2.8	A
	Subtotal	10	9	89.0%	4.1	2.8	A
Total		1,668	1,656	99.3%	3.0	0.4	A

Intersection 210 **Mace Blvd/Co Rd 30B-ARC Dwy 3** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	525	504	96.0%	22.4	2.2	C
	Right Turn	48	46	95.6%	18.3	5.2	B
	Subtotal	573	550	95.9%	22.1	2.3	C
SB	Left Turn	71	74	103.7%	31.3	7.3	C
	Through	995	1,007	101.2%	14.8	1.6	B
	Right Turn						
	Subtotal	1,066	1,080	101.3%	15.8	1.6	B
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	10	12	116.0%	3.2	2.1	A
	Subtotal	10	12	116.0%	3.2	2.1	A
Total		1,649	1,642	99.5%	17.9	1.4	B

Intersection 212 **Project Dwy 5/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	37	37	100.5%	11.5	3.7	B
	Through						
	Right Turn	89	86	96.4%	4.7	0.8	A
	Subtotal	126	123	97.6%	6.8	1.3	A
EB	Left Turn	200	195	97.5%	6.2	1.2	A
	Through	104	103	98.8%	1.9	0.5	A
	Right Turn						
	Subtotal	304	298	97.9%	4.7	1.0	A
WB	Left Turn						
	Through	128	127	99.1%	2.1	0.6	A
	Right Turn	197	198	100.4%	1.1	0.3	A
	Subtotal	325	325	99.9%	1.5	0.4	A
Total		755	745	98.7%	3.6	0.5	A

Intersection 9 **Mace Blvd/Alhambra Blvd-ARC Dwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	258	256	99.1%	37.0	8.2	D
	Through	766	753	98.3%	17.9	5.5	B
	Right Turn	130	127	97.8%	6.5	1.7	A
	Subtotal	1,154	1,136	98.4%	21.1	3.0	C
SB	Left Turn	70	69	99.1%	64.4	28.0	E
	Through	706	691	97.8%	74.6	48.9	E
	Right Turn	23	23	99.1%	22.6	30.1	C
	Subtotal	799	783	98.0%	72.0	46.2	E
EB	Left Turn	12	10	80.0%	40.1	30.8	D
	Through	100	101	100.5%	45.7	6.8	D
	Right Turn	220	228	103.6%	5.3	1.3	A
	Subtotal	332	338	101.8%	18.0	2.6	B
WB	Left Turn	350	318	90.7%	172.3	131.4	F
	Through	143	140	97.8%	31.7	3.0	C
	Right Turn	150	155	103.3%	10.2	3.4	B
	Subtotal	643	612	95.2%	91.3	51.8	F
Total		2,928	2,869	98.0%	48.8	16.7	D

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	14	12	87.1%	38.0	18.3	D
	Through	4	4	110.0%	34.5	28.1	C
	Right Turn	33	32	96.4%	11.7	5.0	B
	Subtotal	51	48	94.9%	24.1	8.2	C
SB	Left Turn	189	186	98.5%	24.2	4.4	C
	Through						
	Right Turn	75	77	103.1%	5.2	1.6	A
	Subtotal	264	263	99.8%	18.0	3.0	B
EB	Left Turn	88	85	96.8%	33.3	4.9	C
	Through	685	676	98.7%	14.5	3.3	B
	Right Turn	7	8	112.9%	8.6	14.1	A
	Subtotal	780	769	98.6%	16.5	3.0	B
WB	Left Turn	56	52	93.2%	39.3	6.9	D
	Through	336	329	97.9%	21.0	4.0	C
	Right Turn	126	123	97.3%	8.5	1.2	A
	Subtotal	518	504	97.2%	20.0	3.2	B
Total		1,613	1,585	98.2%	18.1	2.3	B

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	367	353	96.2%	56.5	16.9	E
	Through	916	910	99.3%	28.0	2.7	C
	Right Turn	133	130	97.5%	8.5	1.2	A
	Subtotal	1,416	1,392	98.3%	33.8	6.4	C
SB	Left Turn	161	151	93.7%	140.5	15.7	F
	Through	953	905	95.0%	126.6	24.5	F
	Right Turn	163	157	96.4%	79.8	20.7	E
	Subtotal	1,277	1,213	95.0%	122.4	21.4	F
EB	Left Turn	154	150	97.3%	39.9	6.9	D
	Through	175	169	96.7%	41.1	4.6	D
	Right Turn	632	623	98.6%	5.9	0.5	A
	Subtotal	961	942	98.0%	17.4	1.5	B
WB	Left Turn	425	408	96.0%	140.2	68.1	F
	Through	24	26	106.3%	49.0	9.8	D
	Right Turn	104	100	95.7%	21.6	7.8	C
	Subtotal	553	533	96.4%	116.6	55.8	F
Total		4,207	4,081	97.0%	67.4	11.2	E

Intersection 12 **ARC Dwy 4/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	76	74	97.5%	40.1	57.1	E
	Through	1	1	120.0%	0.2	0.6	A
	Right Turn	26	29	111.9%	6.1	2.8	A
	Subtotal	103	104	101.4%	30.3	39.1	D
SB	Left Turn	180	183	101.6%	22.5	4.3	C
	Through						
	Right Turn	220	216	98.3%	5.5	2.7	A
	Subtotal	400	399	99.8%	13.2	3.6	B
EB	Left Turn	91	84	91.8%	31.8	7.7	D
	Through	349	339	97.1%	13.5	1.6	B
	Right Turn	25	25	100.8%	10.4	5.3	B
	Subtotal	465	448	96.3%	16.9	2.5	C
WB	Left Turn	4	4	90.0%	25.8	19.3	D
	Through	257	252	97.9%	41.4	80.6	E
	Right Turn	40	40	99.5%	31.1	64.2	D
	Subtotal	301	295	98.0%	40.2	78.2	E
Total		1,269	1,246	98.2%	22.0	22.2	C

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	253	245	96.9%	34.4	4.5	C
	Through	620	607	97.9%	7.4	1.0	A
	Right Turn						
	Subtotal	873	852	97.6%	15.2	1.5	B
SB	Left Turn						
	Through	1,410	1,330	94.3%	75.1	47.2	E
	Right Turn	600	586	97.7%	36.0	27.7	D
	Subtotal	2,010	1,915	95.3%	63.6	41.9	E
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	387	381	98.3%	30.3	2.5	C
	Through						
	Right Turn	796	785	98.6%	5.2	0.4	A
	Subtotal	1,183	1,166	98.5%	13.7	1.4	B
Total		4,066	3,933	96.7%	38.2	20.0	D

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	24	20	82.1%	85.2	13.4	F
	Through	546	549	100.6%	78.9	9.9	E
	Right Turn	162	159	98.0%	54.4	10.3	D
	Subtotal	732	728	99.4%	73.9	10.1	E
SB	Left Turn	282	259	91.7%	140.6	44.4	F
	Through	485	477	98.4%	50.3	14.4	D
	Right Turn	369	358	96.9%	20.4	11.4	C
	Subtotal	1,136	1,093	96.2%	62.6	21.1	E
EB	Left Turn	462	438	94.8%	56.8	3.7	E
	Through	275	271	98.7%	80.2	7.3	F
	Right Turn	85	85	99.9%	2.4	0.3	A
	Subtotal	822	794	96.6%	59.2	4.6	E
WB	Left Turn	46	43	94.3%	34.5	8.4	C
	Through	56	56	99.5%	36.1	7.4	D
	Right Turn	299	297	99.2%	14.7	5.0	B
	Subtotal	401	396	98.7%	20.9	3.5	C
Total		3,091	3,011	97.4%	58.8	8.1	E

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	226	220	97.2%	20.7	10.4	C
	Through						
	Right Turn	29	28	96.6%	3.6	1.7	A
	Subtotal	255	248	97.1%	18.7	9.4	B
EB	Left Turn						
	Through	596	576	96.6%	133.2	87.8	F
	Right Turn						
	Subtotal	596	576	96.6%	133.2	87.8	F
WB	Left Turn						
	Through	449	433	96.3%	10.8	1.8	B
	Right Turn						
	Subtotal	449	433	96.3%	10.8	1.8	B
Total		1,300	1,256	96.6%	70.8	43.0	E

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	15	17	112.7%	58.1	41.4	E
	Through	369	356	96.6%	51.0	41.1	D
	Right Turn	27	25	92.2%	46.5	48.4	D
	Subtotal	411	398	96.9%	51.2	41.5	D
SB	Left Turn	150	148	98.3%	36.3	6.0	D
	Through	249	237	95.3%	16.4	3.0	B
	Right Turn	85	85	100.5%	8.1	1.9	A
	Subtotal	484	470	97.1%	21.1	3.3	C
EB	Left Turn	122	126	103.4%	32.8	16.6	C
	Through	102	100	98.2%	23.1	15.4	C
	Right Turn	24	23	97.5%	18.1	32.0	B
	Subtotal	248	250	100.7%	27.4	17.6	C
WB	Left Turn	21	21	98.1%	31.0	12.5	C
	Through	47	46	97.0%	28.7	10.7	C
	Right Turn	100	104	103.5%	17.2	4.9	B
	Subtotal	168	170	101.0%	21.8	4.5	C
Total		1,311	1,288	98.2%	32.6	16.8	C

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	14	17	118.6%	6.3	1.8	A
	Through	338	330	97.6%	10.0	1.1	A
	Right Turn	9	11	122.2%	5.5	3.5	A
	Subtotal	361	358	99.1%	9.8	1.2	A
SB	Left Turn	107	100	93.1%	8.7	1.3	A
	Through	170	164	96.2%	10.6	1.7	B
	Right Turn	17	18	107.1%	7.4	1.8	A
	Subtotal	294	281	95.7%	9.7	1.5	A
EB	Left Turn	5	3	68.0%	2.6	2.9	A
	Through	7	6	88.6%	4.6	1.7	A
	Right Turn	10	10	103.0%	3.1	0.6	A
	Subtotal	22	20	90.5%	4.0	0.4	A
WB	Left Turn	7	6	88.6%	3.9	2.1	A
	Through	14	14	97.9%	4.9	1.8	A
	Right Turn	68	68	99.3%	4.1	0.4	A
	Subtotal	89	87	98.2%	4.4	0.4	A
Total		766	746	97.4%	9.0	0.8	A

Intersection 7 **Alhambra Blvd/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	133	131	98.6%	18.9	2.4	B
	Through						
	Right Turn	11	11	97.3%	6.4	4.7	A
	Subtotal	144	142	98.5%	17.8	2.4	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	691	688	99.6%	8.7	1.2	A
	Right Turn	215	226	105.2%	6.2	0.4	A
	Subtotal	906	914	100.9%	8.1	1.0	A
WB	Left Turn	17	18	105.3%	41.0	6.4	D
	Through	1,077	1,067	99.0%	29.4	8.9	C
	Right Turn						
	Subtotal	1,094	1,084	99.1%	29.6	8.8	C
Total		2,144	2,141	99.8%	19.9	4.8	B

SimTraffic Post-Processor **Aggie Research Campus**
Average Results from 10 Runs **Existing + Project - Mitigated**
Volume and Delay by Movement **PM Peak Hour**

Intersection 8 **Harper Jr High Dwy/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	37	34	92.4%	15.5	5.9	B
	Through						
	Right Turn	8	8	101.3%	5.6	2.5	A
	Subtotal	45	42	94.0%	13.4	4.8	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	683	681	99.6%	5.7	1.5	A
	Right Turn	19	18	95.8%	4.5	2.0	A
	Subtotal	702	699	99.5%	5.7	1.5	A
WB	Left Turn	22	22	98.2%	35.1	7.7	D
	Through	1,057	1,049	99.2%	25.7	7.0	C
	Right Turn						
	Subtotal	1,079	1,070	99.2%	25.8	6.8	C
Total		1,826	1,811	99.2%	17.4	3.9	B

Intersection 209 **Mace Blvd/ARC Dwy 2** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	848	833	98.2%	4.8	0.7	A
	Right Turn	80	82	102.0%	5.9	1.8	A
	Subtotal	928	914	98.5%	4.9	0.8	A
SB	Left Turn						
	Through	799	794	99.4%	0.5	0.1	A
	Right Turn						
	Subtotal	799	794	99.4%	0.5	0.1	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	130	131	100.5%	7.1	1.2	A
	Subtotal	130	131	100.5%	7.1	1.2	A
Total		1,857	1,839	99.0%	3.1	0.4	A

Intersection 210 **Mace Blvd/Co Rd 30B-Arc Dwy 3** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	958	943	98.4%	0.8	0.1	A
	Right Turn	20	20	100.0%	1.0	0.8	A
	Subtotal	978	963	98.4%	0.8	0.1	A
SB	Left Turn	24	23	97.1%	8.3	3.4	A
	Through	727	723	99.4%	2.2	0.3	A
	Right Turn						
	Subtotal	751	746	99.3%	2.4	0.3	A
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	72	70	97.6%	31.2	16.8	C
	Through						
	Right Turn	100	107	106.6%	21.4	13.0	C
	Subtotal	172	177	102.8%	25.3	14.4	C
Total		1,901	1,886	99.2%	4.1	1.8	A

Intersection 212 **ARC Dwy 5/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	243	250	102.7%	42.4	45.8	E
	Through						
	Right Turn	197	196	99.7%	36.2	37.9	E
	Subtotal	440	446	101.4%	39.6	42.2	E
EB	Left Turn	65	66	100.9%	3.8	0.4	A
	Through	490	487	99.4%	2.2	0.2	A
	Right Turn						
	Subtotal	555	553	99.6%	2.3	0.2	A
WB	Left Turn						
	Through	104	100	95.7%	2.0	3.4	A
	Right Turn	43	43	99.8%	0.7	1.1	A
	Subtotal	147	142	96.9%	1.5	2.4	A
Total		1,142	1,141	99.9%	16.4	14.3	C

Intersection 9 **Mace Blvd/Alhambra Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	320	266	83.0%	60.4	21.3	E
	Through	550	460	83.7%	14.4	4.5	B
	Right Turn						
	Subtotal	870	726	83.4%	31.5	11.4	C
SB	Left Turn						
	Through	840	778	92.7%	210.3	91.6	F
	Right Turn	50	48	95.4%	185.1	105.7	F
	Subtotal	890	826	92.8%	208.8	92.6	F
EB	Left Turn	20	20	100.0%	45.1	17.4	D
	Through						
	Right Turn	440	428	97.3%	21.7	31.6	C
	Subtotal	460	448	97.4%	22.7	30.3	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,220	2,000	90.1%	99.6	34.5	F

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	9	94.0%	27.0	13.5	C
	Through	10	9	94.0%	23.9	14.1	C
	Right Turn	50	55	109.0%	6.5	1.9	A
	Subtotal	70	73	104.7%	12.0	4.2	B
SB	Left Turn	80	77	96.1%	22.0	1.4	C
	Through	10	13	126.0%	19.5	7.5	B
	Right Turn	20	20	98.0%	9.2	5.6	A
	Subtotal	110	109	99.2%	18.8	1.7	B
EB	Left Turn	40	36	90.5%	30.5	8.6	C
	Through	310	300	96.8%	12.8	2.8	B
	Right Turn	30	31	102.7%	7.9	4.2	A
	Subtotal	380	367	96.6%	14.1	3.0	B
WB	Left Turn	155	136	87.9%	33.5	4.6	C
	Through	670	564	84.1%	15.5	2.4	B
	Right Turn	150	130	86.3%	7.1	0.3	A
	Subtotal	975	829	85.0%	17.4	2.5	B
Total		1,535	1,379	89.8%	16.3	2.2	B

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	790	655	83.0%	161.4	7.3	F
	Through	810	669	82.6%	69.6	4.2	E
	Right Turn	30	28	93.7%	66.9	5.0	E
	Subtotal	1,630	1,352	83.0%	115.3	6.1	F
SB	Left Turn	40	36	90.5%	133.1	19.4	F
	Through	1,100	988	89.8%	155.4	21.3	F
	Right Turn	130	118	90.8%	107.1	16.4	F
	Subtotal	1,270	1,143	90.0%	149.4	20.4	F
EB	Left Turn	40	35	87.8%	40.6	11.8	D
	Through	20	21	102.5%	41.6	19.1	D
	Right Turn	430	417	96.9%	9.4	5.5	A
	Subtotal	490	472	96.4%	13.4	4.8	B
WB	Left Turn	20	19	96.5%	36.5	13.1	D
	Through	40	42	105.5%	31.0	5.8	C
	Right Turn	20	20	100.0%	12.6	7.3	B
	Subtotal	80	82	101.9%	27.3	4.9	C
Total		3,470	3,049	87.9%	109.9	7.6	F

Intersection 12 **Mace Park and Ride Entrance/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	9	94.0%	4.1	1.7	A
	Through						
	Right Turn	10	11	111.0%	2.3	0.6	A
	Subtotal	20	21	102.5%	3.1	0.6	A
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	80	73	91.5%	1.5	0.4	A
	Right Turn	10	12	123.0%	1.2	0.6	A
	Subtotal	90	86	95.0%	1.5	0.3	A
WB	Left Turn	10	11	108.0%	2.0	1.4	A
	Through	70	72	102.1%	0.3	0.2	A
	Right Turn						
	Subtotal	80	82	102.9%	0.6	0.3	A
Total		190	188	99.1%	1.3	0.2	A

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	380	309	81.4%	128.4	22.5	F
	Through	770	628	81.6%	186.2	43.9	F
	Right Turn						
	Subtotal	1,150	938	81.5%	167.5	37.4	F
SB	Left Turn						
	Through	1,290	1,157	89.7%	153.5	52.6	F
	Right Turn	260	239	92.0%	92.4	39.8	F
	Subtotal	1,550	1,396	90.1%	143.3	51.1	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	520	469	90.2%	118.6	15.3	F
	Through	10	11	111.0%	121.5	57.6	F
	Right Turn	860	745	86.6%	251.5	22.4	F
	Subtotal	1,390	1,225	88.1%	200.5	18.7	F
Total		4,090	3,559	87.0%	167.7	25.5	F

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	10	99.0%	84.6	25.0	F
	Through	635	598	94.2%	101.3	33.5	F
	Right Turn	50	49	98.0%	66.2	26.5	E
	Subtotal	695	657	94.5%	98.7	33.4	F
SB	Left Turn	280	255	91.1%	128.6	72.2	F
	Through	350	311	88.8%	48.5	20.2	D
	Right Turn	350	312	89.2%	29.4	14.4	C
	Subtotal	980	878	89.6%	66.4	34.8	E
EB	Left Turn	640	409	63.9%	223.7	35.3	F
	Through	220	140	63.8%	33.2	7.0	C
	Right Turn	150	91	60.3%	2.3	0.2	A
	Subtotal	1,010	640	63.3%	150.7	19.7	F
WB	Left Turn	30	28	91.7%	84.7	42.4	F
	Through	110	103	94.0%	80.7	48.0	F
	Right Turn	390	387	99.3%	96.4	57.3	F
	Subtotal	530	518	97.8%	93.0	54.7	F
Total		3,215	2,692	83.7%	97.1	21.8	F

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	480	391	81.4%	396.0	83.0	F
	Through						
	Right Turn	120	111	92.8%	270.3	135.0	F
	Subtotal	600	502	83.7%	366.4	95.7	F
EB	Left Turn						
	Through	530	250	47.1%	581.1	50.8	F
	Right Turn						
	Subtotal	530	250	47.1%	581.1	50.8	F
WB	Left Turn						
	Through	470	424	90.2%	14.7	1.7	B
	Right Turn						
	Subtotal	470	424	90.2%	14.7	1.7	B
Total		1,600	1,175	73.5%	270.5	40.4	F

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	10	103.0%	92.9	81.8	F
	Through	290	282	97.3%	112.2	85.4	F
	Right Turn	70	71	101.7%	95.3	65.0	F
	Subtotal	370	364	98.3%	108.8	81.0	F
SB	Left Turn	90	72	79.7%	36.6	7.8	D
	Through	220	188	85.5%	16.8	4.7	B
	Right Turn	70	59	83.6%	7.6	1.5	A
	Subtotal	380	318	83.8%	19.2	3.4	B
EB	Left Turn	190	190	99.8%	67.5	53.5	E
	Through	100	97	97.1%	46.1	49.2	D
	Right Turn	20	20	101.0%	41.6	61.9	D
	Subtotal	310	307	99.0%	60.5	52.5	E
WB	Left Turn	40	37	92.3%	45.9	20.8	D
	Through	90	90	99.4%	47.9	33.4	D
	Right Turn	110	107	96.8%	44.3	38.9	D
	Subtotal	240	233	97.0%	46.7	33.4	D
Total		1,300	1,222	94.0%	62.4	40.2	E

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	19	96.5%	37.3	70.1	E
	Through	240	242	100.9%	47.2	76.6	E
	Right Turn	10	10	97.0%	40.6	77.3	E
	Subtotal	270	271	100.4%	46.0	75.7	E
SB	Left Turn	70	64	91.1%	8.3	1.3	A
	Through	200	170	84.9%	10.3	0.8	B
	Right Turn	10	10	100.0%	4.7	1.8	A
	Subtotal	280	244	87.0%	9.6	0.8	A
EB	Left Turn	30	30	101.3%	9.5	7.4	A
	Through	10	12	121.0%	5.8	1.6	A
	Right Turn	10	11	107.0%	2.9	1.7	A
	Subtotal	50	53	106.4%	7.6	4.5	A
WB	Left Turn	10	12	116.0%	4.5	1.8	A
	Through	20	20	98.0%	11.1	10.1	B
	Right Turn	100	100	100.1%	12.5	14.6	B
	Subtotal	130	131	101.0%	11.9	12.5	B
Total		730	699	95.8%	27.0	41.5	D

Intersection 9 **Mace Blvd/Alhambra Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	470	408	86.7%	37.4	4.6	D
	Through	680	585	86.1%	18.9	1.6	B
	Right Turn						
	Subtotal	1,150	993	86.3%	26.6	2.8	C
SB	Left Turn						
	Through	700	482	68.8%	674.4	56.7	F
	Right Turn	40	30	74.3%	674.8	97.1	F
	Subtotal	740	512	69.1%	673.8	57.1	F
EB	Left Turn	10	8	79.0%	213.2	142.9	F
	Through						
	Right Turn	390	353	90.4%	306.8	185.8	F
	Subtotal	400	361	90.2%	305.0	184.6	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,290	1,865	81.4%	242.2	40.7	F

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	28	94.3%	42.5	15.8	D
	Through	10	10	102.0%	100.4	48.5	F
	Right Turn	110	109	99.2%	93.4	42.4	F
	Subtotal	150	148	98.4%	84.7	35.4	F
SB	Left Turn	290	161	55.6%	300.6	147.7	F
	Through	10	5	49.0%	26.5	30.5	C
	Right Turn	90	58	64.6%	10.7	9.2	B
	Subtotal	390	224	57.5%	238.9	164.3	F
EB	Left Turn	110	78	71.2%	134.8	37.8	F
	Through	720	472	65.5%	231.6	78.2	F
	Right Turn						
	Subtotal	830	550	66.2%	218.9	73.5	F
WB	Left Turn	115	102	88.9%	92.7	49.0	F
	Through	330	287	87.0%	32.7	19.9	C
	Right Turn	190	154	81.2%	4.3	1.1	A
	Subtotal	635	544	85.6%	37.9	22.7	D
Total		2,005	1,465	73.1%	117.5	21.6	F

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	510	447	87.5%	37.6	5.1	D
	Through	960	842	87.7%	20.1	3.6	C
	Right Turn	40	35	86.3%	14.9	7.0	B
	Subtotal	1,510	1,323	87.6%	26.3	3.1	C
SB	Left Turn	100	75	75.4%	209.6	32.8	F
	Through	850	620	73.0%	260.6	48.1	F
	Right Turn	140	100	71.1%	177.1	33.3	F
	Subtotal	1,090	795	73.0%	245.7	45.6	F
EB	Left Turn	165	110	66.9%	47.6	7.7	D
	Through	120	75	62.5%	51.0	9.5	D
	Right Turn	890	553	62.1%	204.8	45.1	F
	Subtotal	1,175	738	62.8%	163.9	30.8	F
WB	Left Turn	30	32	106.7%	61.7	37.0	E
	Through	20	23	116.0%	37.3	13.1	D
	Right Turn	50	54	107.0%	13.6	7.3	B
	Subtotal	100	109	108.7%	31.1	15.2	C
Total		3,875	2,965	76.5%	114.7	8.6	F

Intersection 12 **Mace Park and Ride Entrance/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	35	117.0%	5.9	1.1	A
	Through						
	Right Turn	20	18	92.0%	3.3	0.9	A
	Subtotal	50	54	107.0%	5.2	0.8	A
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	240	172	71.7%	2.3	0.4	A
	Right Turn	20	13	65.0%	1.8	0.8	A
	Subtotal	260	185	71.2%	2.3	0.3	A
WB	Left Turn	10	9	87.0%	2.1	1.6	A
	Through	70	74	105.9%	0.2	0.2	A
	Right Turn						
	Subtotal	80	83	103.5%	0.5	0.3	A
Total		390	321	82.4%	2.2	0.3	A

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	330	213	64.6%	39.7	6.0	D
	Through	550	360	65.4%	12.2	2.4	B
	Right Turn						
	Subtotal	880	573	65.1%	22.6	3.7	C
SB	Left Turn						
	Through	1,370	894	65.3%	261.1	41.6	F
	Right Turn	400	264	66.1%	168.5	30.9	F
	Subtotal	1,770	1,159	65.5%	242.1	41.3	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	580	567	97.7%	64.9	35.1	E
	Through						
	Right Turn	960	953	99.3%	7.0	1.0	A
	Subtotal	1,540	1,520	98.7%	28.4	13.3	C
Total		4,190	3,251	77.6%	99.5	11.8	F

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	14	47.0%	156.4	45.2	F
	Through	630	299	47.5%	201.4	51.1	F
	Right Turn	180	83	46.1%	184.8	58.2	F
	Subtotal	840	396	47.2%	196.4	52.2	F
SB	Left Turn	345	268	77.7%	204.2	54.0	F
	Through	570	453	79.4%	85.1	22.1	F
	Right Turn	340	275	81.0%	57.2	15.7	E
	Subtotal	1,255	996	79.4%	111.1	30.1	F
EB	Left Turn	430	245	56.9%	193.8	15.2	F
	Through	320	180	56.2%	31.0	10.9	C
	Right Turn	90	51	57.1%	2.2	0.3	A
	Subtotal	840	476	56.7%	111.1	7.6	F
WB	Left Turn	80	70	87.9%	199.3	22.4	F
	Through	60	53	88.2%	207.2	38.5	F
	Right Turn	420	365	86.9%	230.8	27.8	F
	Subtotal	560	488	87.2%	224.2	25.4	F
Total		3,495	2,356	67.4%	146.0	13.6	F

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	270	231	85.5%	276.3	94.6	F
	Through						
	Right Turn	100	99	98.6%	23.1	29.7	C
	Subtotal	370	329	89.0%	203.2	70.9	F
EB	Left Turn						
	Through	570	246	43.1%	541.0	52.1	F
	Right Turn						
	Subtotal	570	246	43.1%	541.0	52.1	F
WB	Left Turn						
	Through	430	344	79.9%	15.1	1.9	B
	Right Turn						
	Subtotal	430	344	79.9%	15.1	1.9	B
Total		1,370	919	67.1%	218.8	30.4	F

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	9	42.5%	418.5	201.6	F
	Through	380	149	39.1%	475.0	181.3	F
	Right Turn	30	12	39.7%	460.0	204.2	F
	Subtotal	430	169	39.3%	471.8	182.4	F
SB	Left Turn	140	103	73.7%	42.3	7.3	D
	Through	260	200	76.7%	18.5	3.0	B
	Right Turn	210	152	72.2%	8.1	1.6	A
	Subtotal	610	454	74.5%	20.7	1.9	C
EB	Left Turn	240	149	62.0%	448.7	43.1	F
	Through	120	71	59.4%	430.7	45.2	F
	Right Turn	30	19	63.0%	367.2	62.6	F
	Subtotal	390	239	61.3%	437.8	38.2	F
WB	Left Turn	20	17	87.0%	139.8	110.2	F
	Through	60	57	94.8%	132.9	126.0	F
	Right Turn	90	83	91.8%	146.6	108.1	F
	Subtotal	170	157	92.3%	141.3	113.2	F
Total		1,600	1,019	63.7%	199.8	22.2	F

SimTraffic Post-Processor **Aggie Research Campus**
Average Results from 10 Runs **Cumulative No Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	8	39.0%	1095.6	323.3	F
	Through	350	131	37.5%	1068.3	234.6	F
	Right Turn	10	4	43.0%	831.5	440.1	F
	Subtotal	380	143	37.7%	1064.8	237.7	F
SB	Left Turn	110	86	78.5%	8.9	1.4	A
	Through	190	141	74.3%	11.3	1.5	B
	Right Turn	10	10	95.0%	6.4	2.7	A
	Subtotal	310	237	76.5%	10.3	1.3	B
EB	Left Turn	10	9	86.0%	84.4	73.3	F
	Through	10	9	86.0%	29.2	33.6	D
	Right Turn	10	11	107.0%	16.1	32.3	C
	Subtotal	30	28	93.0%	32.7	38.6	D
WB	Left Turn	10	7	72.0%	345.0	263.1	F
	Through	20	16	80.0%	327.4	215.4	F
	Right Turn	70	53	75.9%	336.2	184.1	F
	Subtotal	100	76	76.3%	330.3	191.6	F
Total		820	484	59.1%	299.3	54.0	F

Intersection 9 **Mace Blvd/Alhambra Blvd-ARC Dwy 1** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	320	211	65.9%	100.9	28.1	F
	Through	700	479	68.5%	42.7	8.4	D
	Right Turn	350	243	69.4%	31.7	8.7	C
	Subtotal	1,370	933	68.1%	52.9	9.9	D
SB	Left Turn	200	140	70.2%	213.4	21.0	F
	Through	806	546	67.7%	279.6	25.7	F
	Right Turn	50	33	66.2%	247.9	42.3	F
	Subtotal	1,056	719	68.1%	266.4	23.3	F
EB	Left Turn	20	17	84.5%	207.7	36.6	F
	Through	212	183	86.2%	221.4	39.5	F
	Right Turn	498	396	79.6%	298.8	70.1	F
	Subtotal	730	596	81.6%	274.9	64.7	F
WB	Left Turn	182	79	43.2%	694.7	79.7	F
	Through	46	33	70.9%	248.0	153.9	F
	Right Turn	28	19	68.6%	280.0	231.0	F
	Subtotal	256	130	50.9%	574.2	147.5	F
Total		3,412	2,379	69.7%	190.9	14.4	F

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	9	85.0%	26.2	14.6	C
	Through	10	11	113.0%	33.6	11.1	C
	Right Turn	50	53	105.2%	8.3	2.3	A
	Subtotal	70	72	103.4%	14.5	2.5	B
SB	Left Turn	83	83	100.5%	24.3	4.9	C
	Through	10	11	108.0%	16.9	10.4	B
	Right Turn	20	19	94.0%	6.9	3.4	A
	Subtotal	113	113	100.0%	21.3	3.4	C
EB	Left Turn	40	40	100.0%	28.5	8.9	C
	Through	370	378	102.2%	12.8	2.6	B
	Right Turn	30	30	101.0%	9.7	3.5	A
	Subtotal	440	448	101.9%	14.0	2.6	B
WB	Left Turn	155	112	72.1%	36.4	7.3	D
	Through	717	494	68.8%	17.8	3.2	B
	Right Turn	162	114	70.6%	7.5	0.9	A
	Subtotal	1,034	720	69.6%	19.2	2.6	B
Total		1,657	1,354	81.7%	17.3	2.0	B

SimTraffic Post-Processor **Aggie Research Campus**
Average Results from 10 Runs **Cumulative Plus Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	790	530	67.1%	187.1	17.3	F
	Through	1,278	848	66.3%	111.4	37.7	F
	Right Turn	470	320	68.1%	103.7	35.1	F
	Subtotal	2,538	1,698	66.9%	133.2	29.9	F
SB	Left Turn	64	46	72.0%	176.5	18.3	F
	Through	1,242	832	67.0%	196.3	17.0	F
	Right Turn	170	111	65.2%	138.8	13.2	F
	Subtotal	1,476	989	67.0%	189.0	17.2	F
EB	Left Turn	70	63	89.7%	85.1	64.9	F
	Through	53	53	100.2%	47.7	7.3	D
	Right Turn	430	438	101.8%	13.4	6.6	B
	Subtotal	553	554	100.1%	27.1	12.2	C
WB	Left Turn	207	209	100.7%	164.5	109.9	F
	Through	59	60	102.4%	115.9	86.4	F
	Right Turn	22	21	94.5%	96.5	92.1	F
	Subtotal	288	290	100.6%	152.5	104.1	F
Total		4,855	3,530	72.7%	132.6	23.2	F

Intersection 211 **ARC Dwy 4-Mace Park and Ride Entrance/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	21	19	91.4%	40.0	78.3	E
	Through						
	Right Turn	12	13	107.5%	18.5	47.4	C
	Subtotal	33	32	97.3%	30.9	66.7	D
SB	Left Turn	30	29	97.3%	71.3	130.3	F
	Through	2	2	90.0%	7.7	15.2	A
	Right Turn	108	115	106.1%	77.4	154.8	F
	Subtotal	140	146	104.0%	76.5	150.2	F
EB	Left Turn	231	163	70.6%	4.2	0.6	A
	Through	280	202	72.1%	2.4	0.4	A
	Right Turn	76	56	73.4%	1.6	0.5	A
	Subtotal	587	421	71.7%	3.0	0.4	A
WB	Left Turn	22	21	95.9%	21.6	57.5	C
	Through	159	155	97.4%	24.9	55.4	C
	Right Turn	50	55	110.2%	15.5	35.0	C
	Subtotal	231	231	100.0%	23.2	52.9	C
Total		991	830	83.7%	18.6	29.6	C

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	380	230	60.6%	146.6	14.1	F
	Through	1,323	809	61.1%	202.0	16.9	F
	Right Turn						
	Subtotal	1,703	1,039	61.0%	190.3	16.2	F
SB	Left Turn						
	Through	1,482	1,149	77.6%	88.4	49.1	F
	Right Turn	397	297	74.9%	41.2	33.7	D
	Subtotal	1,879	1,447	77.0%	78.8	45.9	E
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	520	387	74.4%	117.7	7.4	F
	Through	10	8	82.0%	108.4	72.0	F
	Right Turn	1,215	885	72.8%	212.8	22.7	F
	Subtotal	1,745	1,280	73.4%	184.0	19.0	F
Total		5,327	3,766	70.7%	144.7	18.0	F

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	10	97.0%	90.2	24.7	F
	Through	686	617	89.9%	113.3	12.9	F
	Right Turn	50	42	83.8%	85.7	15.0	F
	Subtotal	746	668	89.6%	111.6	12.9	F
SB	Left Turn	292	224	76.8%	69.3	19.6	E
	Through	363	273	75.2%	32.8	4.7	C
	Right Turn	381	284	74.5%	22.8	3.9	C
	Subtotal	1,036	781	75.4%	39.4	7.0	D
EB	Left Turn	1,122	378	33.7%	234.7	34.0	F
	Through	220	73	33.0%	34.5	6.8	C
	Right Turn	150	44	29.3%	2.0	0.5	A
	Subtotal	1,492	495	33.2%	185.6	28.7	F
WB	Left Turn	30	24	78.7%	197.9	45.1	F
	Through	110	95	86.3%	224.0	62.0	F
	Right Turn	410	358	87.3%	244.4	59.0	F
	Subtotal	550	477	86.6%	239.7	58.7	F
Total		3,824	2,421	63.3%	122.3	10.1	F

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	888	311	35.0%	614.5	35.9	F
	Through						
	Right Turn	120	38	31.8%	553.8	56.9	F
	Subtotal	1,008	349	34.6%	607.2	32.6	F
EB	Left Turn						
	Through	604	186	30.9%	597.4	40.1	F
	Right Turn						
	Subtotal	604	186	30.9%	597.4	40.1	F
WB	Left Turn						
	Through	501	389	77.6%	14.0	1.9	B
	Right Turn						
	Subtotal	501	389	77.6%	14.0	1.9	B
Total		2,113	924	43.7%	358.8	17.5	F

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	8	84.0%	169.2	84.3	F
	Through	314	295	94.0%	162.3	63.4	F
	Right Turn	70	66	94.7%	158.0	62.0	F
	Subtotal	394	370	93.9%	161.9	63.1	F
SB	Left Turn	90	56	61.9%	37.3	6.3	D
	Through	222	143	64.3%	19.0	3.6	B
	Right Turn	73	51	69.9%	6.8	1.1	A
	Subtotal	385	249	64.8%	20.4	2.8	C
EB	Left Turn	207	206	99.4%	95.5	72.2	F
	Through	100	106	105.5%	71.4	68.9	E
	Right Turn	20	20	99.0%	57.3	76.5	E
	Subtotal	327	331	101.2%	85.3	70.1	F
WB	Left Turn	40	37	92.3%	48.1	22.2	D
	Through	90	85	94.0%	46.1	24.0	D
	Right Turn	118	116	98.0%	40.3	29.5	D
	Subtotal	248	237	95.6%	43.7	25.5	D
Total		1,354	1,187	87.7%	89.3	37.6	F

SimTraffic Post-Processor **Aggie Research Campus**
Average Results from 10 Runs **Cumulative Plus Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	18	91.0%	54.0	75.3	F
	Through	248	238	96.0%	89.7	107.4	F
	Right Turn	10	12	115.0%	64.7	90.5	F
	Subtotal	278	268	96.4%	86.6	104.5	F
SB	Left Turn	70	49	70.0%	7.7	1.6	A
	Through	202	143	70.7%	10.4	0.9	B
	Right Turn	10	8	77.0%	4.8	2.5	A
	Subtotal	282	200	70.7%	9.6	0.8	A
EB	Left Turn	38	40	106.1%	28.1	36.7	D
	Through	10	9	93.0%	12.4	19.4	B
	Right Turn	10	13	125.0%	4.7	3.6	A
	Subtotal	58	62	107.1%	21.6	27.0	C
WB	Left Turn	10	9	88.0%	34.2	40.7	D
	Through	20	18	91.0%	25.6	36.6	D
	Right Turn	108	105	97.0%	36.0	44.0	E
	Subtotal	138	132	95.5%	35.2	42.5	E
Total		756	661	87.5%	44.3	47.8	E

Intersection 7 **Alhambra Blvd/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	150	98	65.4%	16.8	2.9	B
	Through						
	Right Turn	54	38	70.4%	5.0	1.0	A
	Subtotal	204	136	66.7%	13.4	1.7	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	989	961	97.1%	9.1	4.2	A
	Right Turn	293	296	101.2%	5.7	1.8	A
	Subtotal	1,282	1,257	98.0%	8.3	3.6	A
WB	Left Turn	40	30	74.5%	19.8	4.5	B
	Through	520	390	75.0%	9.2	1.5	A
	Right Turn						
	Subtotal	560	420	74.9%	10.0	1.4	A
Total		2,046	1,813	88.6%	9.1	2.6	A

Intersection 8 **Harper Jr High Entrance/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	100	100	100.4%	32.4	11.9	C
	Through						
	Right Turn	10	9	94.0%	48.5	87.7	D
	Subtotal	110	110	99.8%	32.2	12.1	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	913	798	87.4%	223.4	94.8	F
	Right Turn	130	109	84.0%	220.5	121.8	F
	Subtotal	1,043	908	87.0%	222.9	97.9	F
WB	Left Turn	170	112	65.9%	29.8	4.2	C
	Through	460	324	70.3%	24.3	7.1	C
	Right Turn						
	Subtotal	630	436	69.1%	25.5	5.3	C
Total		1,783	1,453	81.5%	139.9	53.3	F

Intersection 209 **Mace Blvd/ARC Dwy 2** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	648	446	68.8%	4.8	0.8	A
	Right Turn	100	70	69.5%	4.5	1.8	A
	Subtotal	748	515	68.9%	4.7	0.6	A
SB	Left Turn						
	Through	1,056	765	72.5%	107.1	14.7	F
	Right Turn						
	Subtotal	1,056	765	72.5%	107.1	14.7	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	10	10	101.0%	2.8	0.9	A
	Subtotal	10	10	101.0%	2.8	0.9	A
Total		1,814	1,291	71.1%	62.1	5.5	E

Intersection 210 **Mace Blvd/Co Rd 30B-ARC Dwy 3** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	610	422	69.2%	1.1	0.3	A
	Right Turn	48	33	69.4%	0.8	0.4	A
	Subtotal	658	455	69.2%	1.1	0.2	A
SB	Left Turn	71	51	71.3%	218.4	44.6	F
	Through	1,056	787	74.5%	248.7	26.7	F
	Right Turn						
	Subtotal	1,127	838	74.3%	247.1	26.9	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	10	12	122.0%	3.7	1.8	A
	Subtotal	10	12	122.0%	3.7	1.8	A
Total		1,795	1,305	72.7%	151.4	10.4	F

Intersection 212 **Project Dwy 5/Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	37	37	98.6%	10.0	3.3	A
	Through						
	Right Turn	89	93	104.9%	4.4	0.9	A
	Subtotal	126	130	103.1%	6.0	1.1	A
EB	Left Turn	200	153	76.4%	5.3	1.0	A
	Through	122	89	73.0%	0.7	0.3	A
	Right Turn						
	Subtotal	322	242	75.1%	3.6	0.7	A
WB	Left Turn						
	Through	142	137	96.5%	2.4	0.6	A
	Right Turn	197	195	99.1%	1.3	0.3	A
	Subtotal	339	332	98.1%	1.8	0.4	A
Total		787	704	89.5%	3.2	0.4	A

Intersection 9 **Mace Blvd/Alhambra Blvd-ARC Dwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	476	353	74.1%	53.9	11.5	D
	Through	837	637	76.1%	28.6	6.6	C
	Right Turn	130	97	74.8%	20.5	6.4	C
	Subtotal	1,443	1,087	75.4%	36.2	7.3	D
SB	Left Turn	70	35	50.6%	966.3	198.7	F
	Through	755	386	51.1%	1062.2	204.1	F
	Right Turn	40	23	56.5%	1037.2	247.8	F
	Subtotal	865	444	51.3%	1055.0	204.7	F
EB	Left Turn	10	9	94.0%	255.2	71.5	F
	Through	100	81	81.1%	275.8	55.6	F
	Right Turn	411	328	79.7%	378.1	81.8	F
	Subtotal	521	418	80.2%	358.6	75.6	F
WB	Left Turn	350	155	44.2%	597.9	164.8	F
	Through	143	76	53.2%	293.5	228.8	F
	Right Turn	150	85	56.7%	287.4	237.7	F
	Subtotal	643	316	49.1%	449.9	192.6	F
Total		3,472	2,265	65.2%	300.7	23.0	F

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	30	100.7%	35.2	11.1	D
	Through	10	11	112.0%	56.0	37.6	E
	Right Turn	110	105	95.6%	67.5	43.2	E
	Subtotal	150	147	97.7%	60.4	30.0	E
SB	Left Turn	307	199	64.8%	191.0	55.4	F
	Through	10	6	55.0%	27.6	26.6	C
	Right Turn	90	62	69.2%	9.1	5.3	A
	Subtotal	407	267	65.5%	143.0	37.2	F
EB	Left Turn	110	77	70.2%	142.1	94.1	F
	Through	795	538	67.7%	193.5	100.7	F
	Right Turn						
	Subtotal	905	615	68.0%	187.3	98.8	F
WB	Left Turn	115	81	70.0%	89.4	88.4	F
	Through	396	288	72.8%	28.2	8.2	C
	Right Turn	195	141	72.5%	8.0	1.4	A
	Subtotal	706	510	72.3%	27.7	5.7	C
Total		2,168	1,539	71.0%	101.6	24.6	F

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	510	409	80.2%	178.0	32.4	F
	Through	1,160	922	79.4%	201.3	34.8	F
	Right Turn	141	112	79.7%	197.8	40.5	F
	Subtotal	1,811	1,443	79.7%	194.3	34.3	F
SB	Left Turn	163	101	61.7%	215.3	16.3	F
	Through	1,143	645	56.4%	246.7	24.0	F
	Right Turn	210	118	56.0%	163.1	14.8	F
	Subtotal	1,516	863	56.9%	230.9	21.6	F
EB	Left Turn	195	130	66.6%	299.0	122.1	F
	Through	182	123	67.6%	161.3	115.5	F
	Right Turn	890	582	65.4%	163.1	27.5	F
	Subtotal	1,267	835	65.9%	182.0	34.6	F
WB	Left Turn	436	187	42.9%	278.0	64.9	F
	Through	22	9	42.7%	232.8	85.4	F
	Right Turn	113	49	43.6%	211.7	41.6	F
	Subtotal	571	246	43.1%	261.4	56.5	F
Total		5,165	3,387	65.6%	204.2	20.7	F

Intersection 211 **ARC Dwy 4/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	84	20	23.7%	632.1	176.5	F
	Through	26	6	24.2%	549.4	273.0	F
	Right Turn	34	9	25.3%	535.0	315.0	F
	Subtotal	144	35	24.2%	438.9	257.0	F
SB	Left Turn	180	21	11.6%	673.8	197.7	F
	Through						
	Right Turn	220	22	9.9%	705.2	189.5	F
	Subtotal	400	43	10.7%	510.6	308.8	F
EB	Left Turn	91	62	68.2%	4.4	2.0	A
	Through	364	250	68.7%	2.5	0.5	A
	Right Turn	31	23	74.8%	2.0	0.9	A
	Subtotal	486	335	69.0%	2.9	0.7	A
WB	Left Turn	12	9	71.7%	189.3	160.1	F
	Through	267	203	75.9%	319.2	173.7	F
	Right Turn	40	32	80.0%	315.7	206.9	F
	Subtotal	319	243	76.2%	321.2	173.5	F
Total		1,349	656	48.6%	133.1	33.3	F

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	330	216	65.3%	42.9	7.0	D
	Through	724	472	65.2%	26.0	18.2	C
	Right Turn						
	Subtotal	1,054	688	65.2%	31.3	14.1	C
SB	Left Turn						
	Through	1,688	941	55.8%	203.0	30.3	F
	Right Turn	781	424	54.3%	122.7	22.3	F
	Subtotal	2,469	1,365	55.3%	179.0	29.2	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	580	539	92.9%	111.2	25.9	F
	Through						
	Right Turn	1,087	989	90.9%	164.5	50.2	F
	Subtotal	1,667	1,528	91.6%	146.1	40.9	F
Total		5,190	3,580	69.0%	137.0	22.1	F

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	17	56.0%	136.6	20.3	F
	Through	658	363	55.2%	165.6	33.9	F
	Right Turn	180	97	54.1%	146.1	36.2	F
	Subtotal	868	477	55.0%	160.3	33.7	F
SB	Left Turn	368	258	70.1%	129.0	55.0	F
	Through	625	445	71.3%	54.5	11.7	D
	Right Turn	420	285	67.8%	37.8	6.1	D
	Subtotal	1,413	988	69.9%	68.4	20.4	E
EB	Left Turn	553	291	52.6%	172.4	10.1	F
	Through	320	154	48.3%	30.9	6.5	C
	Right Turn	90	42	46.2%	2.1	0.4	A
	Subtotal	963	487	50.6%	114.2	4.7	F
WB	Left Turn	80	64	80.5%	196.6	34.8	F
	Through	60	53	88.8%	197.3	20.6	F
	Right Turn	443	376	84.8%	240.7	37.9	F
	Subtotal	583	494	84.6%	230.8	34.0	F
Total		3,827	2,446	63.9%	125.4	11.0	F

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	321	253	78.7%	426.7	134.0	F
	Through						
	Right Turn	100	81	80.6%	334.3	234.3	F
	Subtotal	421	333	79.1%	401.0	161.1	F
EB	Left Turn						
	Through	642	232	36.2%	568.1	75.5	F
	Right Turn						
	Subtotal	642	232	36.2%	568.1	75.5	F
WB	Left Turn						
	Through	510	354	69.4%	14.6	1.3	B
	Right Turn						
	Subtotal	510	354	69.4%	14.6	1.3	B
Total		1,573	920	58.5%	274.6	36.5	F

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	9	43.0%	327.5	130.1	F
	Through	391	197	50.4%	395.1	136.1	F
	Right Turn	30	15	48.7%	369.4	99.7	F
	Subtotal	441	220	49.9%	393.0	133.5	F
SB	Left Turn	148	95	64.3%	39.9	7.9	D
	Through	284	190	66.7%	18.9	5.3	B
	Right Turn	228	154	67.5%	8.1	1.8	A
	Subtotal	660	439	66.4%	19.4	2.4	B
EB	Left Turn	243	171	70.3%	406.9	80.9	F
	Through	120	85	70.8%	414.9	102.9	F
	Right Turn	30	21	68.7%	366.4	92.4	F
	Subtotal	393	276	70.3%	406.0	82.4	F
WB	Left Turn	20	20	97.5%	85.8	57.8	F
	Through	60	57	95.2%	101.4	69.6	F
	Right Turn	92	89	96.3%	104.0	67.9	F
	Subtotal	172	165	96.0%	100.7	66.5	F
Total		1,666	1,100	66.0%	189.8	24.1	F

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	10	50.5%	1003.9	331.9	F
	Through	359	169	47.0%	1076.4	204.0	F
	Right Turn	10	6	58.0%	907.1	299.1	F
	Subtotal	389	185	47.5%	1068.3	204.0	F
SB	Left Turn	118	80	67.7%	8.6	1.0	A
	Through	198	137	69.3%	11.4	1.6	B
	Right Turn	18	13	74.4%	7.8	4.7	A
	Subtotal	334	231	69.0%	10.4	1.2	B
EB	Left Turn	11	12	105.5%	58.6	38.2	F
	Through	10	12	118.0%	20.8	28.3	C
	Right Turn	10	10	100.0%	28.6	28.5	D
	Subtotal	31	33	107.7%	40.9	24.5	E
WB	Left Turn	10	9	89.0%	279.2	140.7	F
	Through	20	17	87.0%	230.3	150.4	F
	Right Turn	71	63	88.0%	264.6	165.4	F
	Subtotal	101	89	87.9%	254.6	155.4	F
Total		855	538	62.9%	314.1	43.6	F

Intersection 7 **Alhambra Blvd/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	160	109	68.1%	24.0	7.6	C
	Through						
	Right Turn	20	15	76.0%	9.1	12.0	A
	Subtotal	180	124	68.9%	21.8	6.8	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	767	715	93.3%	121.6	173.3	F
	Right Turn	220	215	97.5%	91.5	165.6	F
	Subtotal	987	930	94.2%	114.1	172.2	F
WB	Left Turn	24	19	77.9%	36.4	14.5	D
	Through	1,143	852	74.6%	17.8	7.0	B
	Right Turn						
	Subtotal	1,167	871	74.6%	18.3	7.1	B
Total		2,334	1,925	82.5%	48.1	41.4	D

Intersection 8 **Harper Jr High Dwy/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	40	39	98.5%	28.4	19.5	C
	Through						
	Right Turn	10	9	92.0%	53.8	51.0	D
	Subtotal	50	49	97.2%	33.9	24.8	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	757	563	74.3%	516.5	97.3	F
	Right Turn	30	21	71.0%	473.3	153.9	F
	Subtotal	787	584	74.2%	515.2	96.8	F
WB	Left Turn	20	14	70.5%	37.6	12.0	D
	Through	1,127	832	73.8%	23.3	8.4	C
	Right Turn						
	Subtotal	1,147	846	73.7%	23.5	8.3	C
Total		1,984	1,478	74.5%	151.4	20.8	F

Intersection 209 **Mace Blvd/ARC Dwy 2** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	917	675	73.6%	6.5	1.3	A
	Right Turn	80	60	74.6%	5.2	1.5	A
	Subtotal	997	734	73.7%	6.4	1.2	A
SB	Left Turn						
	Through	865	496	57.3%	199.5	51.0	F
	Right Turn						
	Subtotal	865	496	57.3%	199.5	51.0	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	130	127	97.7%	11.5	5.3	B
	Subtotal	130	127	97.7%	11.5	5.3	B
Total		1,992	1,357	68.1%	61.3	4.1	F

Intersection 210 **Mace Blvd/Co Rd 30B-Arc Dwy 3** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,027	788	76.7%	1.1	0.2	A
	Right Turn	20	15	76.0%	0.6	0.4	A
	Subtotal	1,047	803	76.7%	1.1	0.2	A
SB	Left Turn	24	16	65.8%	459.3	140.8	F
	Through	793	491	61.9%	446.7	80.6	F
	Right Turn						
	Subtotal	817	506	62.0%	446.3	80.3	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	72	27	37.6%	769.3	91.1	F
	Through						
	Right Turn	100	38	37.5%	766.2	94.5	F
	Subtotal	172	65	37.6%	674.4	249.1	F
Total		2,036	1,374	67.5%	144.0	13.4	F

Intersection 212 **ARC Dwy 5/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	243	181	74.4%	271.2	160.3	F
	Through						
	Right Turn	197	141	71.8%	285.0	160.9	F
	Subtotal	440	322	73.2%	276.5	158.8	F
EB	Left Turn	65	31	47.7%	3.0	1.4	A
	Through	513	251	48.9%	0.8	0.2	A
	Right Turn						
	Subtotal	578	282	48.8%	1.0	0.3	A
WB	Left Turn						
	Through	122	113	92.6%	88.8	79.1	F
	Right Turn	43	42	97.2%	75.4	78.0	F
	Subtotal	165	155	93.8%	85.7	78.7	F
Total		1,183	759	64.2%	96.7	41.3	F

Intersection 9 **Mace Blvd/Alhambra Blvd-ARC Dwy 1** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	320	202	63.1%	112.4	60.4	F
	Through	700	451	64.5%	17.9	4.8	B
	Right Turn	350	231	66.1%	7.1	1.1	A
	Subtotal	1,370	884	64.6%	35.9	15.0	D
SB	Left Turn	200	169	84.6%	230.9	39.7	F
	Through	806	649	80.5%	238.1	25.7	F
	Right Turn	50	40	80.4%	210.9	70.2	F
	Subtotal	1,056	858	81.3%	235.7	20.7	F
EB	Left Turn	20	19	96.5%	92.0	40.4	F
	Through	212	205	96.6%	93.5	31.9	F
	Right Turn	498	488	98.1%	115.1	55.6	F
	Subtotal	730	713	97.6%	108.5	47.6	F
WB	Left Turn	182	115	63.1%	487.7	145.0	F
	Through	46	44	95.4%	65.7	51.6	E
	Right Turn	28	27	96.4%	48.8	88.7	D
	Subtotal	256	186	72.6%	341.8	119.4	F
Total		3,412	2,641	77.4%	136.1	13.4	F

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	12	122.0%	21.6	11.0	C
	Through	10	10	98.0%	19.8	13.8	B
	Right Turn	50	53	105.4%	6.0	0.8	A
	Subtotal	70	75	106.7%	10.9	2.7	B
SB	Left Turn	83	82	98.9%	23.6	3.6	C
	Through	10	11	106.0%	24.0	13.3	C
	Right Turn	20	22	110.0%	4.6	2.2	A
	Subtotal	113	115	101.5%	20.1	3.9	C
EB	Left Turn	40	41	103.5%	24.1	6.4	C
	Through	370	365	98.5%	11.1	2.4	B
	Right Turn	30	30	101.0%	8.6	3.4	A
	Subtotal	440	436	99.1%	12.0	2.2	B
WB	Left Turn	155	103	66.3%	33.2	3.8	C
	Through	717	499	69.5%	17.3	2.0	B
	Right Turn	162	107	66.1%	7.6	0.8	A
	Subtotal	1,034	709	68.5%	18.3	1.9	B
Total		1,657	1,334	80.5%	16.0	1.2	B

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	790	497	62.9%	172.5	11.2	F
	Through	1,278	807	63.1%	75.2	7.5	E
	Right Turn	470	297	63.1%	54.5	6.5	D
	Subtotal	2,538	1,600	63.0%	102.1	10.7	F
SB	Left Turn	64	56	87.7%	129.9	9.6	F
	Through	1,242	1,014	81.6%	144.6	9.8	F
	Right Turn	170	138	81.4%	100.8	6.8	F
	Subtotal	1,476	1,208	81.8%	138.3	9.1	F
EB	Left Turn	70	63	90.4%	42.5	16.9	D
	Through	53	51	95.3%	47.6	13.6	D
	Right Turn	430	424	98.6%	5.3	0.5	A
	Subtotal	553	538	97.3%	14.3	4.0	B
WB	Left Turn	207	206	99.6%	48.4	31.1	D
	Through	59	59	100.3%	40.1	9.1	D
	Right Turn	22	21	97.3%	26.2	33.4	C
	Subtotal	288	287	99.6%	45.1	26.1	D
Total		4,855	3,633	74.8%	97.2	7.8	F

Intersection 12 **ARC Dwy 4-Mace Park and Ride Entrance/Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	21	20	92.9%	15.7	5.1	C
	Through						
	Right Turn	12	11	90.8%	2.4	1.9	A
	Subtotal	33	30	92.1%	12.6	5.5	B
SB	Left Turn	30	29	97.3%	22.3	6.3	C
	Through	2	2	85.0%	9.6	17.0	A
	Right Turn	108	106	98.1%	4.6	0.8	A
	Subtotal	140	137	97.8%	8.5	1.8	A
EB	Left Turn	231	152	65.6%	20.4	2.8	C
	Through	280	197	70.5%	8.7	1.1	A
	Right Turn	76	54	71.4%	4.8	1.5	A
	Subtotal	587	403	68.7%	12.4	1.3	B
WB	Left Turn	22	19	87.3%	24.1	4.5	C
	Through	159	160	100.8%	13.8	1.8	B
	Right Turn	50	54	108.0%	7.6	2.5	A
	Subtotal	231	234	101.1%	13.3	1.8	B
Total		991	804	81.1%	12.0	0.7	B

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	380	247	65.1%	125.4	12.5	F
	Through	1,323	885	66.9%	172.1	21.6	F
	Right Turn						
	Subtotal	1,703	1,132	66.5%	161.6	19.7	F
SB	Left Turn						
	Through	1,482	1,296	87.4%	89.9	54.1	F
	Right Turn	397	346	87.2%	35.8	30.7	D
	Subtotal	1,879	1,642	87.4%	78.4	48.4	E
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	520	308	59.3%	138.1	8.9	F
	Through	10	6	59.0%	106.7	79.5	F
	Right Turn	1,215	717	59.0%	273.6	19.7	F
	Subtotal	1,745	1,032	59.1%	232.5	16.8	F
Total		5,327	3,806	71.4%	143.6	19.3	F

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	7	65.0%	158.0	31.1	F
	Through	686	428	62.4%	190.1	28.4	F
	Right Turn	50	35	70.0%	144.9	42.3	F
	Subtotal	746	470	62.9%	186.4	29.4	F
SB	Left Turn	292	211	72.3%	181.0	43.8	F
	Through	363	268	73.8%	51.6	14.3	D
	Right Turn	381	284	74.4%	21.3	10.4	C
	Subtotal	1,036	763	73.6%	78.8	22.3	E
EB	Left Turn	1,122	716	63.8%	130.9	21.3	F
	Through	220	138	62.8%	59.0	15.5	E
	Right Turn	150	95	63.1%	2.0	0.2	A
	Subtotal	1,492	948	63.6%	108.0	15.2	F
WB	Left Turn	30	26	85.3%	208.7	47.1	F
	Through	110	89	81.0%	220.2	27.7	F
	Right Turn	420	349	83.0%	204.6	21.9	F
	Subtotal	560	463	82.7%	208.9	20.9	F
Total		3,834	2,644	69.0%	132.5	11.2	F

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	888	699	78.7%	368.3	63.1	F
	Through						
	Right Turn	120	96	79.7%	336.3	68.9	F
	Subtotal	1,008	795	78.8%	364.1	62.0	F
EB	Left Turn						
	Through	604	264	43.7%	539.1	62.2	F
	Right Turn						
	Subtotal	604	264	43.7%	539.1	62.2	F
WB	Left Turn						
	Through	501	381	75.9%	12.7	1.7	B
	Right Turn						
	Subtotal	501	381	75.9%	12.7	1.7	B
Total		2,113	1,439	68.1%	303.2	31.6	F

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	10	6	57.0%	320.0	111.5	F
	Through	314	189	60.1%	397.6	49.1	F
	Right Turn	70	44	63.1%	380.4	68.6	F
	Subtotal	394	239	60.6%	392.1	53.6	F
SB	Left Turn	90	63	70.4%	37.0	7.4	D
	Through	222	147	66.4%	17.5	3.4	B
	Right Turn	73	53	71.9%	8.1	1.7	A
	Subtotal	385	263	68.4%	20.1	2.1	C
EB	Left Turn	207	161	77.7%	345.8	78.8	F
	Through	100	81	80.9%	312.7	119.5	F
	Right Turn	20	16	78.0%	337.8	128.5	F
	Subtotal	327	257	78.7%	332.6	95.4	F
WB	Left Turn	40	38	94.0%	192.3	99.4	F
	Through	90	83	92.2%	194.0	92.0	F
	Right Turn	118	118	100.2%	205.6	93.1	F
	Subtotal	248	239	96.3%	199.7	93.1	F
Total		1,354	998	73.7%	223.5	39.0	F

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	13	64.0%	970.4	223.4	F
	Through	248	139	56.2%	1066.9	156.3	F
	Right Turn	10	6	58.0%	992.2	344.8	F
	Subtotal	278	158	56.8%	1060.7	158.0	F
SB	Left Turn	70	47	67.3%	8.4	1.0	A
	Through	202	144	71.0%	11.7	1.6	B
	Right Turn	10	8	79.0%	3.8	2.2	A
	Subtotal	282	199	70.4%	10.8	1.5	B
EB	Left Turn	38	38	100.3%	76.3	44.7	F
	Through	10	12	115.0%	47.1	70.9	E
	Right Turn	10	10	96.0%	32.8	49.4	D
	Subtotal	58	59	102.1%	64.6	46.1	F
WB	Left Turn	10	8	79.0%	299.1	203.6	F
	Through	20	17	85.0%	371.6	113.5	F
	Right Turn	108	83	76.9%	369.5	120.0	F
	Subtotal	138	108	78.3%	364.5	104.9	F
Total		756	524	69.3%	333.8	26.0	F

Intersection 7 **Alhambra Blvd/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	150	106	70.7%	19.2	4.7	B
	Through						
	Right Turn	54	39	71.7%	7.7	6.0	A
	Subtotal	204	145	70.9%	16.5	4.6	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	989	982	99.3%	8.0	1.1	A
	Right Turn	293	295	100.7%	5.3	0.8	A
	Subtotal	1,282	1,277	99.6%	7.3	1.0	A
WB	Left Turn	40	30	74.0%	21.0	3.5	C
	Through	520	383	73.6%	8.9	1.5	A
	Right Turn						
	Subtotal	560	412	73.6%	9.9	1.7	A
Total		2,046	1,834	89.6%	8.7	1.3	A

Intersection 8 **Harper Jr High Entrance/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	100	95	95.1%	20.9	3.3	C
	Through						
	Right Turn	10	10	104.0%	9.3	8.0	A
	Subtotal	110	106	95.9%	20.3	3.2	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	913	898	98.4%	10.5	1.8	B
	Right Turn	130	129	99.2%	7.2	1.1	A
	Subtotal	1,043	1,027	98.5%	10.1	1.7	B
WB	Left Turn	160	104	65.2%	22.8	3.6	C
	Through	460	319	69.4%	20.5	5.5	C
	Right Turn						
	Subtotal	620	424	68.3%	21.0	3.7	C
Total		1,773	1,556	87.8%	13.8	1.7	B

Intersection 209 **Mace Blvd/ARC Dwy 2** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	648	435	67.1%	2.7	0.4	A
	Right Turn	100	68	67.6%	3.7	1.4	A
	Subtotal	748	502	67.2%	2.8	0.4	A
SB	Left Turn						
	Through	1,056	916	86.8%	92.8	11.5	F
	Right Turn						
	Subtotal	1,056	916	86.8%	92.8	11.5	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	10	10	97.0%	2.1	1.5	A
	Subtotal	10	10	97.0%	2.1	1.5	A
Total		1,814	1,428	78.7%	57.5	4.3	F

Intersection 210 **Mace Blvd/Co Rd 30B-ARC Dwy 3** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	610	413	67.7%	0.7	0.2	A
	Right Turn	48	32	66.0%	0.5	0.4	A
	Subtotal	658	445	67.6%	0.7	0.2	A
SB	Left Turn	71	69	97.3%	180.8	96.4	F
	Through	1,056	940	89.0%	214.2	92.8	F
	Right Turn						
	Subtotal	1,127	1,009	89.5%	212.1	92.9	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	10	10	99.0%	2.2	1.1	A
	Subtotal	10	10	99.0%	2.2	1.1	A
Total		1,795	1,464	81.5%	135.6	52.3	F

Intersection 212 **Project Dwy 5/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	37	36	98.1%	8.6	1.9	A
	Through						
	Right Turn	89	89	100.2%	4.7	1.0	A
	Subtotal	126	126	99.6%	5.8	1.2	A
EB	Left Turn	200	146	73.2%	6.1	1.1	A
	Through	122	89	73.0%	1.8	0.3	A
	Right Turn						
	Subtotal	322	235	73.1%	4.5	0.7	A
WB	Left Turn						
	Through	142	143	101.0%	2.5	0.6	A
	Right Turn	197	199	100.9%	1.4	0.3	A
	Subtotal	339	342	100.9%	1.9	0.3	A
Total		787	703	89.3%	3.4	0.4	A

Intersection 9 **Mace Blvd/Alhambra Blvd-ARC Dwy** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	476	406	85.4%	98.1	39.0	F
	Through	837	734	87.6%	23.3	3.8	C
	Right Turn	130	115	88.3%	8.4	2.5	A
	Subtotal	1,443	1,255	87.0%	47.5	14.6	D
SB	Left Turn	70	44	63.4%	917.9	150.8	F
	Through	755	470	62.3%	1017.9	208.3	F
	Right Turn	40	25	61.5%	952.1	182.6	F
	Subtotal	865	539	62.3%	1009.0	202.6	F
EB	Left Turn	10	11	106.0%	109.1	86.9	F
	Through	100	100	99.9%	100.2	77.5	F
	Right Turn	411	391	95.1%	109.7	119.8	F
	Subtotal	521	501	96.2%	108.0	111.6	F
WB	Left Turn	350	180	51.4%	536.9	154.9	F
	Through	143	94	65.5%	195.8	86.6	F
	Right Turn	150	98	65.3%	165.4	68.6	F
	Subtotal	643	371	57.8%	381.1	119.6	F
Total		3,472	2,667	76.8%	266.2	19.7	F

Intersection 10 **Second St/Fermi Place** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	29	96.7%	34.6	11.8	C
	Through	10	9	94.0%	26.8	19.6	C
	Right Turn	110	113	102.5%	17.9	6.9	B
	Subtotal	150	151	100.7%	22.0	6.6	C
SB	Left Turn	307	308	100.2%	44.4	18.3	D
	Through	10	10	104.0%	22.7	17.0	C
	Right Turn	90	89	99.3%	7.0	2.5	A
	Subtotal	407	407	100.1%	34.4	12.3	C
EB	Left Turn	110	107	97.1%	49.1	8.9	D
	Through	795	786	98.9%	36.9	23.1	D
	Right Turn						
	Subtotal	905	893	98.7%	38.0	20.1	D
WB	Left Turn	115	100	86.8%	56.2	9.5	E
	Through	396	320	80.8%	29.8	5.9	C
	Right Turn	195	155	79.5%	8.8	1.5	A
	Subtotal	706	575	81.4%	28.3	5.2	C
Total		2,168	2,026	93.5%	32.8	10.9	C

Intersection 11 **Mace Blvd/Second St-Co Rd 32A** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	510	428	83.9%	174.4	6.6	F
	Through	1,160	988	85.2%	86.3	6.8	F
	Right Turn	141	119	84.5%	53.0	6.1	D
	Subtotal	1,811	1,535	84.8%	108.1	6.5	F
SB	Left Turn	163	116	71.2%	189.5	23.8	F
	Through	1,143	776	67.9%	194.8	20.5	F
	Right Turn	210	143	68.2%	133.9	14.9	F
	Subtotal	1,516	1,035	68.3%	186.8	19.1	F
EB	Left Turn	195	198	101.5%	68.2	62.8	E
	Through	182	179	98.2%	61.4	44.2	E
	Right Turn	890	874	98.2%	23.2	13.3	C
	Subtotal	1,267	1,251	98.7%	37.5	21.0	D
WB	Left Turn	436	349	80.1%	299.3	55.8	F
	Through	22	22	98.2%	67.1	25.6	E
	Right Turn	113	102	89.8%	44.9	26.9	D
	Subtotal	571	473	82.7%	231.9	41.1	F
Total		5,165	4,294	83.1%	116.9	7.8	F

Intersection 12 **ARC Dwy 4/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	84	75	89.0%	265.4	217.3	F
	Through	26	23	90.0%	20.6	11.4	C
	Right Turn	34	32	93.5%	6.6	3.1	A
	Subtotal	144	130	90.3%	121.1	68.8	F
SB	Left Turn	180	177	98.3%	40.7	24.2	E
	Through						
	Right Turn	220	215	97.7%	122.8	117.4	F
	Subtotal	400	392	98.0%	84.8	70.0	F
EB	Left Turn	91	78	85.8%	44.7	9.9	E
	Through	364	309	84.8%	18.2	5.8	C
	Right Turn	31	26	83.9%	13.3	6.8	B
	Subtotal	486	413	84.9%	22.7	6.5	C
WB	Left Turn	12	10	85.0%	253.0	155.3	F
	Through	267	212	79.3%	267.3	114.4	F
	Right Turn	40	33	83.0%	280.5	144.6	F
	Subtotal	319	255	80.0%	269.9	117.2	F
Total		1,349	1,190	88.2%	95.7	41.2	F

Intersection 13 **Mace Blvd/I-80 WB Ramps** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	330	292	88.4%	41.9	3.7	D
	Through	724	620	85.6%	27.1	7.7	C
	Right Turn						
	Subtotal	1,054	911	86.5%	32.2	5.5	C
SB	Left Turn						
	Through	1,688	1,329	78.7%	137.7	25.4	F
	Right Turn	781	639	81.8%	81.0	22.4	F
	Subtotal	2,469	1,968	79.7%	119.7	24.2	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	580	513	88.4%	107.1	27.3	F
	Through						
	Right Turn	1,087	940	86.5%	190.7	53.9	F
	Subtotal	1,667	1,453	87.2%	161.4	44.4	F
Total		5,190	4,332	83.5%	113.7	15.0	F

Intersection 14 **Mace Blvd/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	30	23	75.7%	100.2	26.3	F
	Through	658	585	88.9%	88.2	6.8	F
	Right Turn	180	158	87.6%	63.2	4.7	E
	Subtotal	868	765	88.1%	83.0	6.1	F
SB	Left Turn	368	322	87.4%	85.8	20.4	F
	Through	625	511	81.7%	35.0	2.8	C
	Right Turn	420	344	82.0%	13.3	2.4	B
	Subtotal	1,413	1,177	83.3%	42.7	7.4	D
EB	Left Turn	553	355	64.1%	76.5	6.6	E
	Through	320	209	65.2%	105.5	7.5	F
	Right Turn	90	57	63.2%	2.1	0.3	A
	Subtotal	963	620	64.4%	78.7	6.6	E
WB	Left Turn	80	76	94.8%	48.6	10.7	D
	Through	60	58	96.5%	51.5	11.7	D
	Right Turn	443	466	105.1%	25.3	4.3	C
	Subtotal	583	599	102.8%	31.1	4.5	C
Total		3,827	3,161	82.6%	56.9	2.7	E

Intersection 15 **I-80 EB Off-Ramp/Chiles Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	321	322	100.2%	72.5	30.7	E
	Through						
	Right Turn	100	95	95.2%	4.4	0.8	A
	Subtotal	421	417	99.0%	58.3	24.0	E
EB	Left Turn						
	Through	642	299	46.6%	495.7	36.5	F
	Right Turn						
	Subtotal	642	299	46.6%	495.7	36.5	F
WB	Left Turn						
	Through	510	424	83.2%	13.7	1.4	B
	Right Turn						
	Subtotal	510	424	83.2%	13.7	1.4	B
Total		1,573	1,140	72.5%	157.2	9.6	F

Intersection 16 **Mace Blvd/Cowell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	20	98.0%	164.7	32.6	F
	Through	391	349	89.3%	231.4	37.1	F
	Right Turn	30	26	85.0%	226.7	46.4	F
	Subtotal	441	394	89.4%	228.3	37.9	F
SB	Left Turn	148	119	80.7%	43.4	7.2	D
	Through	284	227	80.1%	20.9	4.1	C
	Right Turn	228	184	80.7%	9.4	2.1	A
	Subtotal	660	531	80.4%	22.1	3.2	C
EB	Left Turn	243	227	93.6%	158.9	67.1	F
	Through	120	123	102.3%	137.6	73.9	F
	Right Turn	30	29	96.3%	130.7	84.0	F
	Subtotal	393	379	96.4%	150.7	69.6	F
WB	Left Turn	20	20	101.5%	54.5	16.6	D
	Through	60	62	102.7%	36.9	13.6	D
	Right Turn	92	91	99.3%	30.3	11.1	C
	Subtotal	172	173	100.8%	35.9	11.1	D
Total		1,666	1,477	88.7%	108.7	22.5	F

Intersection 17 **Mace Blvd/El Marcero Dr** **All-way Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	20	18	91.0%	206.3	121.9	F
	Through	359	332	92.4%	237.7	124.0	F
	Right Turn	10	9	91.0%	211.1	112.4	F
	Subtotal	389	359	92.3%	235.5	122.7	F
SB	Left Turn	118	99	84.2%	9.4	1.5	A
	Through	198	164	82.6%	11.3	1.0	B
	Right Turn	18	14	78.3%	8.3	2.1	A
	Subtotal	334	277	82.9%	10.4	1.1	B
EB	Left Turn	11	11	97.3%	10.5	9.3	B
	Through	10	10	98.0%	6.8	4.4	A
	Right Turn	10	10	96.0%	3.2	1.3	A
	Subtotal	31	30	97.1%	7.9	3.2	A
WB	Left Turn	10	11	106.0%	14.1	20.4	B
	Through	20	21	107.0%	17.8	12.8	C
	Right Turn	71	69	97.6%	26.9	13.0	D
	Subtotal	101	101	100.3%	24.2	12.8	C
Total		855	767	89.7%	116.0	55.4	F

Intersection 7 **Alhambra Blvd/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	160	132	82.4%	18.8	2.7	B
	Through						
	Right Turn	20	19	92.5%	6.5	2.8	A
	Subtotal	180	150	83.5%	17.0	3.0	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	767	761	99.2%	9.6	1.5	A
	Right Turn	220	222	101.1%	6.4	0.5	A
	Subtotal	987	983	99.6%	8.9	1.2	A
WB	Left Turn	24	20	84.6%	40.3	14.8	D
	Through	1,143	966	84.5%	27.3	9.1	C
	Right Turn						
	Subtotal	1,167	986	84.5%	27.6	9.2	C
Total		2,334	2,120	90.8%	18.7	4.9	B

Intersection 8 **Harper Jr High Dwy/Covell Blvd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	40	39	96.8%	14.7	5.7	B
	Through						
	Right Turn	10	10	98.0%	3.9	4.4	A
	Subtotal	50	49	97.0%	13.5	5.4	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	757	735	97.1%	43.4	49.8	D
	Right Turn	30	27	91.3%	33.5	42.5	C
	Subtotal	787	762	96.9%	43.0	49.3	D
WB	Left Turn	20	18	88.5%	32.8	11.6	C
	Through	1,127	941	83.5%	22.2	7.3	C
	Right Turn						
	Subtotal	1,147	959	83.6%	22.3	7.3	C
Total		1,984	1,770	89.2%	29.0	21.9	C

Intersection 209 **Mace Blvd/ARC Dwy 2** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	917	779	85.0%	4.3	0.6	A
	Right Turn	80	67	84.0%	4.7	1.7	A
	Subtotal	997	847	84.9%	4.3	0.6	A
SB	Left Turn						
	Through	865	590	68.2%	167.4	52.3	F
	Right Turn						
	Subtotal	865	590	68.2%	167.4	52.3	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through						
	Right Turn	130	134	102.8%	6.9	1.4	A
	Subtotal	130	134	102.8%	6.9	1.4	A
Total		1,992	1,570	78.8%	54.4	5.1	F

Intersection 210 **Mace Blvd/Co Rd 30B-Arc Dwy 3** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through	1,027	894	87.1%	0.8	0.1	A
	Right Turn	20	20	100.5%	0.8	0.5	A
	Subtotal	1,047	914	87.3%	0.8	0.1	A
SB	Left Turn	24	18	75.4%	473.2	107.1	F
	Through	793	585	73.8%	491.0	81.4	F
	Right Turn						
	Subtotal	817	603	73.8%	490.5	81.1	F
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	72	28	39.2%	759.3	79.8	F
	Through						
	Right Turn	100	39	39.2%	764.3	69.4	F
	Subtotal	172	67	39.2%	759.0	75.3	F
Total		2,036	1,585	77.8%	175.3	27.1	F

Intersection 212 **ARC Dwy 5/Co Rd 32A** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	243	203	83.4%	262.6	200.1	F
	Through						
	Right Turn	197	162	82.0%	249.7	178.3	F
	Subtotal	440	364	82.8%	254.7	186.7	F
EB	Left Turn	65	60	92.9%	5.7	4.4	A
	Through	513	457	89.0%	3.6	5.0	A
	Right Turn						
	Subtotal	578	517	89.5%	3.9	4.9	A
WB	Left Turn						
	Through	122	115	94.2%	69.7	101.2	F
	Right Turn	43	44	101.6%	69.4	92.3	F
	Subtotal	165	159	96.1%	69.1	98.5	F
Total		1,183	1,040	87.9%	66.9	36.6	F