TRAFFIC IMPACT ANALYSIS

FOR

CREEKSIDE PLAZA
Missouri Flat Road at Forni Road
El Dorado County CA

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EXECUTIVE SUMMARY

- **Project Description.** The Creekside Plaza project is located in the northwest quadrant of the Missouri Flat Road / Forni Road intersection. The site will consist of four uses. Two of the uses include a 12-fueling position, 2,880 square foot gas station / C-store and an automated one tunnel automated car wash all located on the north side of the site. On the south side of the site 2,250 square foot fast-food restaurant with drive-through lane and 7,950 square feet of retail uses are proposed. A 6,600 square foot retail building is proposed in the southwest corner of the site adjacent to the Missouri Flat Rod / Forni Road intersection. An additional 1,350 square foot retail pad attached to the fast-food restaurant is proposed. After accounting for internal and pass-by trips the project is expected to generate approximately 2,520 new daily trips, with 154 new trips occurring during the a.m. peak hour, 209 new trips generated during the p.m. peak hour and 169 new trips projected during the midday peak hour. Access to the site will be from three access driveways. One driveway along Forni Road will provide full access by adding a fourth leg to the Forni Road / Golden Center Drive intersection. Two driveways are along Missouri Flat Road with the southern driveway consisting of right-in, right-out only movements. The northern driveway will have access from Road 2233 which has full access onto Missouri Flat Road.

- **Existing Setting.** The study areas addressed traffic conditions at eleven existing intersections on Missouri Flat Road. Traffic counts were completed during the first week of May 2023. A.m. and p.m. counts were conducted and 11 intersections while counts were conducted at four intersections due to the proximity of the site to Herbert Green Middle School.

  Intersection Level of Service calculations were made using *Synchro-SimTraffic* software. In addition, intersections with two-way left-turn-lanes (TWLTL) were analyzed using Synchro 7th Edition methodology as SimTraffic is not able to analyze two-stage gap acceptance at these intersections.

  Three roadway segments along Missouri Flat Road, between US 50 and Pleasant Valley Road, were analyzed using the methods presented in the County's *Transportation Impact Study Guidelines*.

Intersections

All intersections, except the Missouri Flat Road / China Garden Road intersection operates within acceptable El Dorado County LOS thresholds during the a.m., midday and p.m. peak periods.

- Missouri Flat Road / China Garden Road: The westbound China Garden Road approach will operate at LOS F in the a.m. and p.m. peak hours. While this intersection is at the boundary of a segment allowed to operate at LOS F a conservative approach was undertaken assuming the LOS E threshold. The intersection meets the peak hour signal warrant.

  As a result of the mitigations identified in the *El Dorado County Public Safety Facility Project Draft EIR,* side street approaches to the Missouri Flat Road / China Garden Road intersection will be limited to right turns only. The DEIR noted two alternative mitigations for this intersection, installation of a traffic signal or limiting minor street access to right turns only.

  As part of the *El Dorado County Public Safety Facility Project* County staff determined that a signal at China Garden Road is not the preferred alternative based on the location of the future traffic signal at Industrial Drive; the signal at Industrial Drive was constructed as part of the Public Safety Facility project. Implementation of a right-turn only along China Garden Road will result in LOS D conditions for side street traffic in both a.m. (32.6 spv) and p.m. (25.1 spv) peak hours. Due to access considerations, the County determined that the right-in, right-out reconfiguration of the intersection will be modified once Diamond Springs Parkway is completed.

Queues

Under current conditions the three movements below have queues that exceed the available storage.

Missouri Flat Road / EB US 50 ramps
- NB through lane
- SB left turn lane

Missouri Flat Road / Mother Lode Drive
- SB through

Missouri Flat Road at US 50 Eastbound Ramps – Queues along the northbound through lane and the southbound left turn lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent intersections. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Missouri Flat Road at Mother Lode Drive – Queues along the southbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent US 50 Eastbound On-ramp intersection. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Roadway Segments

Missouri Flat Road, Golden Center Drive to China Garden Road. This segment operates at LOS F conditions in the two-lane segment. No recommendations are made as this roadway segment will be widened to four lanes as part of a future County CIP project.

Existing Plus Project Conditions

Intersections

All intersections except the Missouri Flat Road / China Garden Road intersection will operate within acceptable El Dorado County LOS thresholds during the a.m., midday and p.m. peak periods. The following recommendations are noted:

- Missouri Flat Road / China Garden Road: The China Garden Road approach will continue to operate at LOS F in the a.m. and p.m. peak hour. The intersection will meet the peak hour signal warrant. As noted earlier, the County determined that a signal at China Garden Road is not a practical alternative based on the installation of the traffic signal installed at Industrial Drive as part of the *El Dorado County Public Safety Facility Project*, and that right turn only access along China Garden Road is the preferred alternative. Implementation of the right-turn only restrictions along China Garden Road will result in LOS E condition in the a.m. peak hour (35.5 spv) and LOS C condition in the p.m. peak hour (21.9 spv) for side street traffic.

- The project shall contribute its fair share to the cost of regional circulation improvements via the existing countywide traffic impact mitigation (TIM) fee program.

- The project should construct the following improvements:

  - Install a crosswalk along the north side of the Forni Road / Golden Center Drive / Project intersection to indicate the preferred crossing location for pedestrians. The installation of a crosswalk on the north side will reduce the number of potential conflicts with motor vehicles as most vehicles at this intersection travel between Missouri Flat Road and Forni Road;
  - Install a crosswalk across the project driveway at the Golden Center Drive intersection;
  - As shown on the site plan, sidewalk should be installed along the entire project frontage on Forni Road;

- The site plan shows a pathway / sidewalk constructed connecting the proposed pedestrian crossing on the north side of Golden Center Drive into the project site; this provides access to the fast food restaurant. As shown on the site plan the sidewalk along the curb return in the southwest corner of the Golden Center Drive / Project driveway intersection will connect to the internal pedestrian system to provide access to the retail building;
- Install a No Parking Zone along the Forni Road project frontage to maximize sight distance at the driveway;
- The County should consider conducting a speed survey to identify an appropriate posted speed limit along Forni Road in the project vicinity. Currently, the roadway is not signed which may confuse motorists as to the prima facie speed. Signs in advance of the Herbert Green Middle School provide a 25 mph speed limit when children are present.

The following on-site improvements should be constructed:

- A crosswalk at the fast-food drive-through entrance should be installed to provide pedestrian access across to Forni Road;
- Landscaping adjacent to any driveways, conveyor-system entrances and exits should be limited to vegetation no higher than 2 feet to provide visibility at key locations;
- Install a stop sign at the car wash conveyor-system exit;
- Truck access should be limited to off-hours as the drive aisles could be blocked while trucks are unloading;
- Install "Do Not Block" or Type V directional arrows markings and / or signage at internal intersections where one-way traffic flow is present.
- Add center line striping at the driveway and on Road 2233 between the north driveway and Missouri Flat Road
- Plant low lying vegetation in the west corner of the Road 2233 / Project Driveway intersection.

Queues

Under Existing plus Project conditions the five movements below have queues that exceed the available storage.

Missouri Flat Road / WB US 50 ramps - NB through lane	Missouri Flat Road / EB US 50 ramps - NB through lane - SB left turn lane
Missouri Flat Road / Mother Lode Drive - SB through	Missouri Flat Road / SR 49 - EB left turn

Missouri Flat Road at US 50 Westbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by

the adjacent intersections. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Missouri Flat Road at US 50 Eastbound Ramps – Queues along the northbound through lane and the southbound left turn lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent intersections. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Missouri Flat Road at Mother Lode Drive – Queues along the southbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent US 50 Eastbound On-ramp intersection. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Missouri Flat Road at SR 49 (Pleasant Valley Road – Queues along the eastbound left turn lane will exceed the available storage by about 12 feet. This is less than one car length and is assumed to be contained within the left turn taper.

Roadway Segments

Missouri Flat Road, Golden Center Drive to China Garden Road. This segment will continue to operate at LOS F conditions in the two-lane segment. No recommendations are made as this roadway segment will be widened to four lanes as part of a future County CIP project.

- **Year 2040 Background Conditions.** Year 2040 traffic forecasts were based on the most recent Countywide traffic model. Roadways in 2040 are generally projected to remain with their current lane configurations. The following changes to the roadway network are identified in the El Dorado County Adopted 2022 Capital Improvement Program:

  - Diamond Springs Parkway – This project is slated for construction in FY 23/24 through FY 24/25. This roadway will include two through lanes in each direction beginning along Missouri Flat Road east of Golden Center Drive to SR 49 south of Bradley Drive. Turn lanes will be provided at key intersections. Missouri Flat Road will become the west and south legs of the Missouri Flat Road / Diamond Springs Parkway intersection. Northbound Missouri Flat Road will consist of dual left turn lanes and a shared through-right lane.

  - Missouri Flat Road south of Diamond Springs Parkway – This project will widen Missouri Flat Road to include two through lanes in each direction, sidewalk, curb and gutter and bike lanes Between China Garden Road and Pleasant Valley Road (SR 49); the segment between China Garden Road and Diamond Springs Parkway is part of the Diamond Springs Parkway project. This project is scheduled between FY 33/34 and FY 42/43.

- Missouri Flat Road / Enterprise Drive intersection – This project will install a traffic signal with scheduled completion by FY 23/24; this signal has been assumed completed under Existing and Existing plus Project conditions.

- Missouri Flat Road / Industrial Drive intersection – This project will install a traffic signal, construct turn lanes and provide for minor realignment of Industrial Drive. The signal is currently operational in a temporary arrangement with wood poles. The scheduled completion of the project is FY 23/24.

- Missouri Flat Road / China Garden Road – The *El Dorado County Public Safety Facility Project EIR (2016)* identified two alternative mitigations for this intersection. These included signalization of the intersection or alternatively, restricting the eastbound and westbound approaches to right-turns only. County staff determined that a signal at China Garden Road is not the preferred alternative based on the proximity of the traffic signal at Industrial Drive. Therefore, side street approaches to the Missouri Flat Road / China Garden Road intersection will be limited to right turns only.

- El Dorado Trail Missouri Flat Road Bike / Pedestrian Overcrossing - This project will construct a bicycle/pedestrian over-crossing as part of the El Dorado Trail at Missouri Flat Road with construction scheduled for FY 23/24.

Traffic signal timing was optimized at all intersections under the assumption that signal operations do not remain static between Existing and Cumulative conditions.

Intersections

All intersections will operate within acceptable El Dorado County LOS thresholds during the a.m., midday and p.m. peak periods.

Queues

Under 2040 conditions the five movements below have queues that will exceed the available storage.

Missouri Flat Road / EB US 50 ramps
- NB through lane

Missouri Flat Road / EB US 50 ramps
- NB through lane

Missouri Flat Road / Mother Lode Drive
- SB through lane

Missouri Flat Road / Forni Road
- SB right turn lane

Missouri Flat Road / Diamond Springs Parkway
- EB right turn

Missouri Flat Road at US 50 Westbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by

the adjacent intersections. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at US 50 Eastbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent intersections. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Mother Lode Drive – Queues along the southbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent US 50 Eastbound On-ramp intersection. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Forni Road – Queues along the southbound right turn lane will exceed the available storage. The storage length for the southbound right turn lane cannot be lengthened due to Missouri Flat Road being built out. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Diamond Springs Parkway – The eastbound right turn lane was assumed to be 250 feet. Queues along the eastbound right turn lane will exceed this distance. The County should confirm the right turn lane provides adequate storage in the Diamond Springs Parkway improvement plans.

Roadway Segments

All roadway segments will operate within the County level of service threshold, at LOS C or better.

- **2040 Plus Project Conditions.** The trips generated by the proposed project were superimposed onto the Year 2040 background conditions and resulting peak hour Levels of Service were calculated.

Intersections

All intersections will operate within acceptable El Dorado County LOS thresholds during the a.m., midday and p.m. peak periods.

Queues

Under 2040 plus Project conditions the five movements below have queues that will exceed the available storage.

Missouri Flat Road / EB US 50 ramps
- NB through lane

Missouri Flat Road / EB US 50 ramps
- NB through lane

Missouri Flat Road / Mother Lode Drive
- SB through lane

Missouri Flat Road / Forni Road
- SB right turn lane

Missouri Flat Road / Diamond Springs Parkway
- EB right turn

Missouri Flat Road at US 50 Westbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent intersections. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at US 50 Eastbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent intersections. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Mother Lode Drive – Queues along the southbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent US 50 Eastbound On-ramp intersection. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Forni Road – Queues along the southbound right turn lane will exceed the available storage. The storage length for the southbound right turn lane cannot be lengthened due to Missouri Flat Road being built out. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Diamond Springs Parkway – The eastbound right turn lane was assumed to be 250 feet. Queues along the eastbound right turn lane will exceed this distance. The County should confirm the right turn lane provides adequate storage in the Diamond Springs Parkway improvement plans.

Roadway Segments

All roadway segments will continue to operate within the County level of service threshold, at LOS C or better.

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INTRODUCTION

Study Purpose Project Description and Objectives

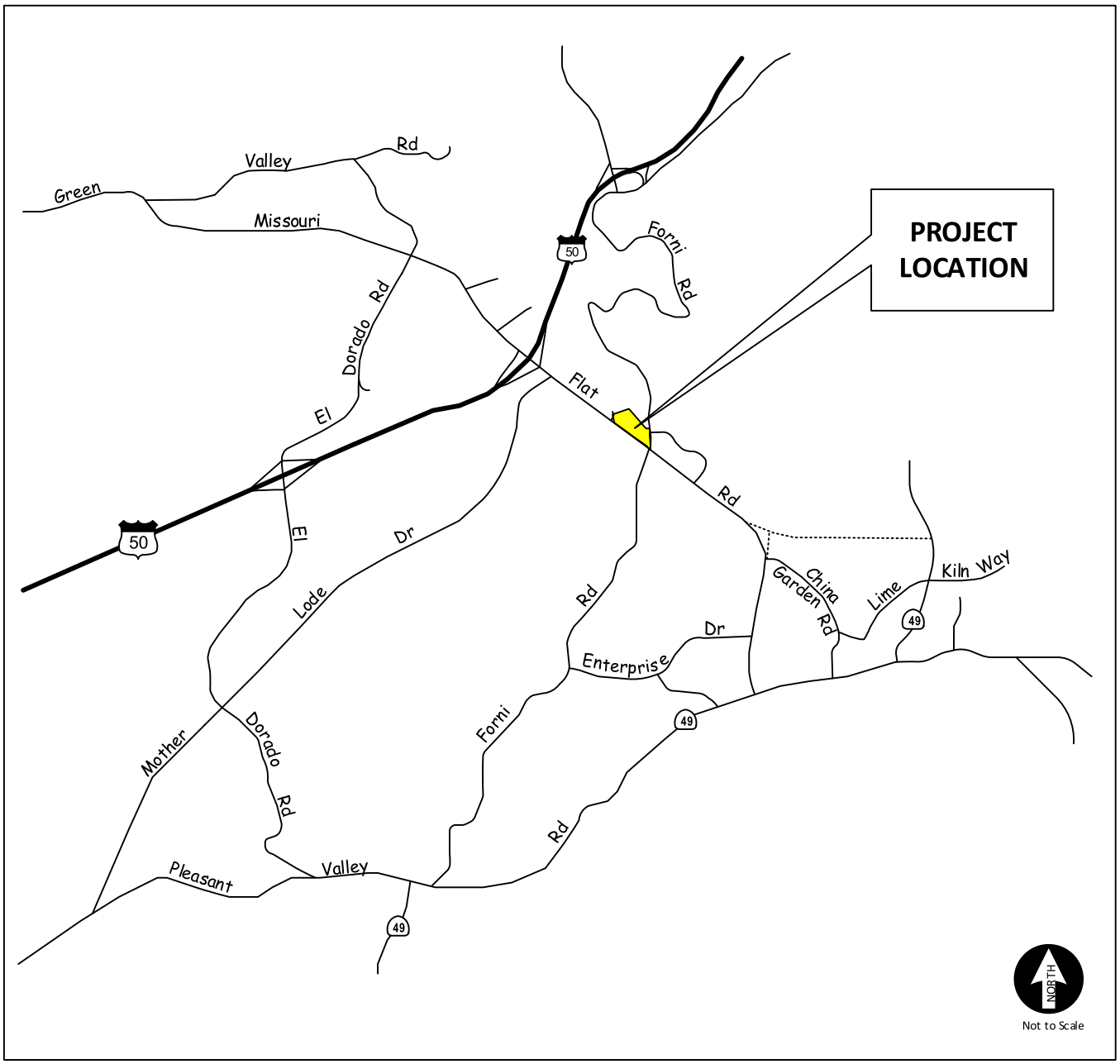
This study identifies and evaluates the traffic conditions associated with the construction of the Creekside Plaza project. The project is located in the northwest quadrant of the Missouri Flat Road / Forni Road intersection (Figure 1). The project includes four land uses. Two uses, a gas station / convenience store (C-store) and a tunnel car wash will be located on the north side of the site while a fast-food restaurant with drive-through lane and retail uses will be located on the south side of the site. The gas station / C-store consists of 12 fueling positions and a 2,880 square foot C-store while the car wash includes a single automated tunnel with vacuum stations available at the exit. The south side of the site includes a 6,600 square foot building at the corner of the Missouri Flat Road / Forni Road intersection for retail uses while a separate building includes an additional 1,350 square feet of retail use attached to a 2,200 fast food restaurant with drive-through lane (Figure 2).

Access to the site will be at three locations, two along Missouri Flat Road and one along Forni Road. A right-in, right-out driveway will be provided along Missouri Flat Road about midway along the project frontage. Full access will be provided via the existing Road 2233 intersection at Missouri Flat Road with a project driveway that will access Road 2233. A third access will be provided at the Forni Road / Golden Center Drive intersection. The project will construct the fourth leg at the existing intersection. The project will also extend the third northbound lane along Missouri Flat Road. Currently, a third lane exists departing the Forni Road intersection and includes a lane drop about 200' north of the intersection. This lane will be extended along the project frontage to Road 2233 where the lane will become a mandatory right turn.

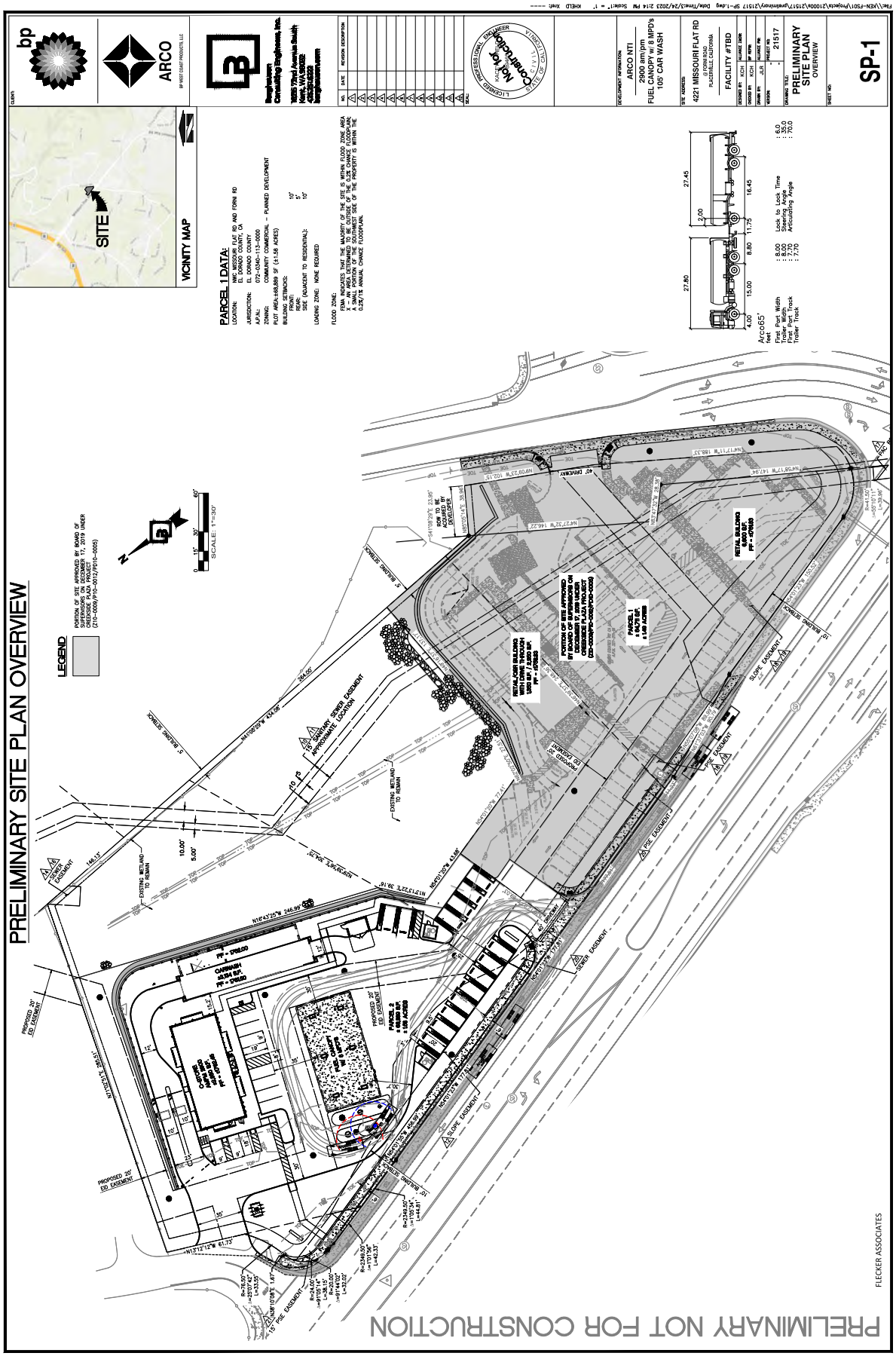
The scope of this traffic analysis has been identified through consideration of El Dorado County traffic study guidelines in consultation with El Dorado County Department of Transportation (DOT). Based on direction from DOT this study addresses the following scenarios:

1. Existing Traffic Conditions
2. Existing Plus Project Conditions
3. 2040 Traffic Conditions
4. 2040 Plus Project Conditions

The objective of this study is to identify those roads and street intersections that may be affected by development of this project based on El Dorado County significance criteria.



VICINITY MAP


PRELIMINARY SITE PLAN OVERVIEW
PRELIMINARY NOT FOR CONSTRUCTION
SP-1
PARCEL 1 DATA:
LOCATION: NWC MISSOURI FLAT RD AND FORNI RD EL DORADO COUNTY, CA
JURISDICTION: EL DORADO COUNTY
A.P.No.: 072-534O-113-0000
ZONING: CG-PD (GENERAL COMMERCIAL – PLANNED DEVELOPMENT
PLOT AREA=49,899 SF (1.58 ACRES)
BUILDING SETBACKS: FRONT: 10'
REAR: 5'
SIDE (ADJACENT TO RESIDENTIAL): 10'
LOADING ZONE: NONE REQUIRED
FLOOD ZONE:
ITEM: INDICATES THAT THE MAJORITY OF THE SITE IS WITHIN FLOOD ZONE AREA "X" AS DESIGNATED BY FEMA ON FLOOD INSURANCE RATE MAP NUMBER 06017C0478F
A SMALL PORTION OF THE SOUTHWEST SIDE OF THE PROPERTY IS WITHIN THE 0.2% ANNUAL CHANCE FLOODPLAIN.
VICINITY MAP
SITE
LEGEND
PORTION OF SITE APPROVED BY BOARD OF SUPERVISORS ON DECEMBER 17, 2019 UNDER CREEKSIDE PLAZA PROJECT (CUP21-0004/P-E25-0001/P21-0006)
SCALE: 1"=30'
RETAIL/CBR BUILDING WITH DRIVE THROUGH 5,000 SF MAX. FF - 2,950
PARCEL 1 1.58/78 SF ± 1.146 ACRES
RETAIL BUILDING 9,000 SF FF - 6,750.00
CANOPY 4224 SF. FF = 0'MSL
PROPOSED 20' ED EASEMENT
EXISTING WETLAND TO REMAIN
SEWER EASEMENT
SLOPE EASEMENT
PUE EASEMENT
ARCO NTI
2900 am/pm
FUEL CANOPY w/ 8 MPD's
105' CAR WASH
4221 MISSOURI FLAT RD
@ FORNI ROAD
PLACERVILLE CALIFORNIA
FACILITY #TBD
Engineer
Consulting Engineers, Inc.
Kent, WA 98032
425.251.6222
Engineer@comm
FLECKER ASSOCIATES

EXISTING SETTING

Study Area

This study addresses traffic conditions at eleven (11) existing intersections and three roadway segments generally along Missouri Flat Road and shown in Figure 3. The limits of the study area were based on the previous traffic study prepared for this site in 2022 by KD Anderson & Associates, Inc. (KDA). That project was also known as Creekside. The limits of this study were reviewed with El Dorado County Long Range Planning (LRP). The text that follows describes the roadway facilities included in this analysis.

The quality of traffic flow is typically governed by the operation of major intersections and the daily volume of traffic along the roadways. The physical characteristics of the study intersections are described in the text which follows.

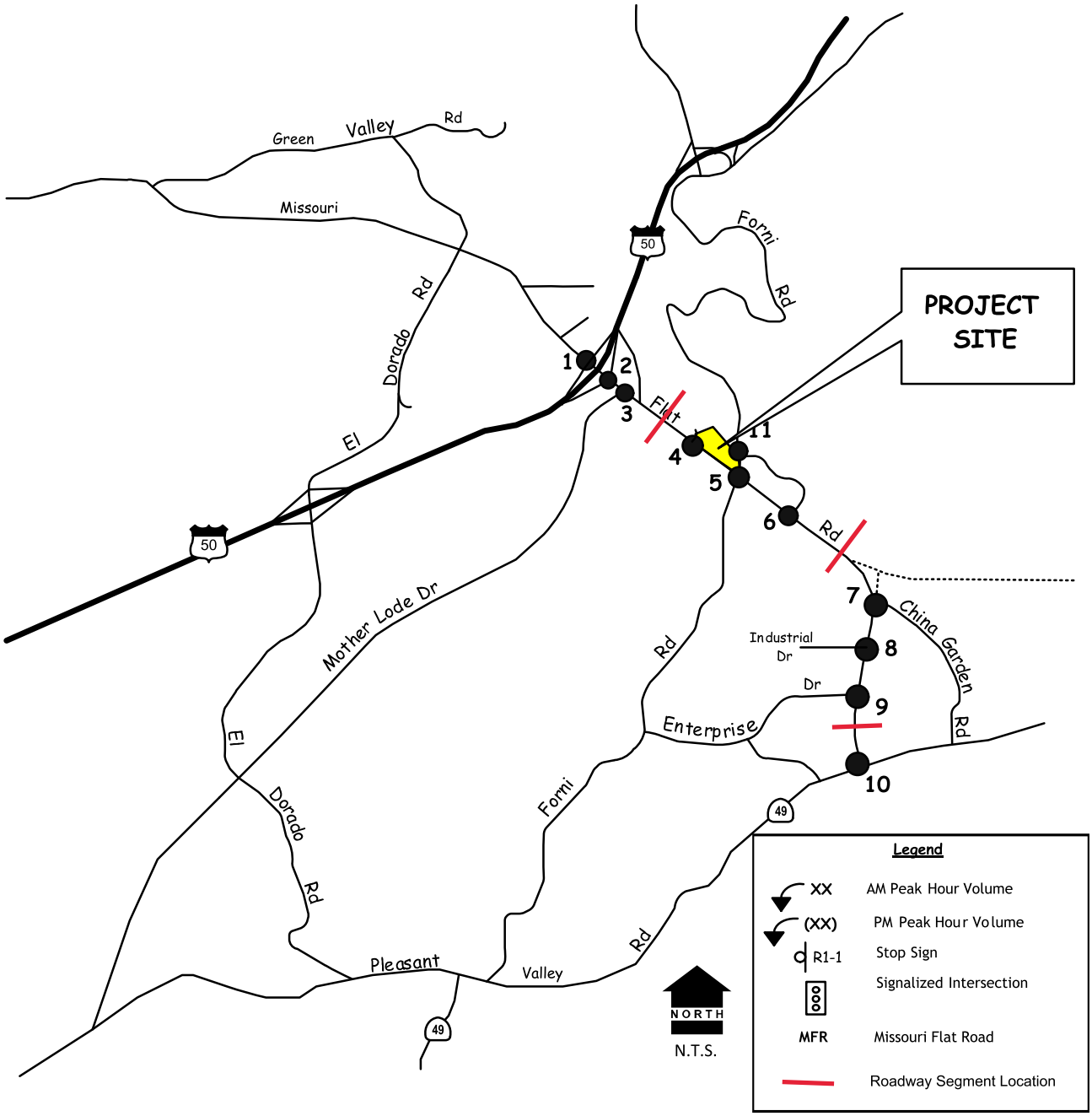
Study Area Intersections

The **Missouri Flat Road / Westbound US 50 ramps** intersection is controlled by a coordinated traffic signal. Missouri Flat Road is a four-lane facility and includes dual northbound left turn lanes and a separate southbound right turn lane. The four lane exit from US 50 is configured with a left turn lane, a shared left-through lane and dual right turn lanes. This intersection is about 450 feet from the eastbound ramps intersection.

The **Missouri Flat Road / Eastbound US 50 ramps** intersection is controlled by a coordinated traffic signal. Missouri Flat Road includes a four-lane roadway with dual southbound left turn lanes and a separate northbound right turn lane. The three lane exit from eastbound US 50 is configured with separate left turn and right turn lanes, and a shared left-thru-right lane. This intersection is about 450 feet from the westbound ramps intersection and about 225 feet from the Mother Lode Drive intersection.

The **Missouri Flat Road / Mother Lode Drive** intersection is signalized and located roughly 250 feet from the Eastbound US 50 ramps intersection. The Missouri Flat Road approaches include a left turn lane for northbound traffic and a right turn lane for southbound traffic. The eastbound Mother Lode Drive approach has three lanes, two left turn lanes and a right turn lane. This intersection is about 225 feet from the eastbound ramps intersection.

The **Missouri Flat Road / Road 2233** intersection is stop controlled along Road 2233 and is located roughly 1,600 feet south of the Mother Lode Drive intersection. The Missouri Flat Road approaches include two lanes in each direction with a two-way-left-turn-lane (TWLTL) extending from Perks Court just south of Mother Lode Drive to 185’ south of the Road 2233 intersection. The Road 2233 approach has a single lane for traffic entering the intersection.



INTERSECTION AND ROADWAY LOCATIONS

The **Missouri Flat Road / Forni Road** intersection is signalized and located roughly ½ mile south of the Mother Lode Drive intersection. Both Missouri Flat Road approaches include two through lanes each and separate left turn and right turn lanes. The eastbound Forni Road approach includes dual left turn lanes, a through lane and a right turn lane while the westbound approach includes separate left, through and right lanes.

The **Missouri Flat Road / Golden Center Drive** intersection is located about 1,100 feet south of Forni Road. This signalized intersection includes separate left turn lanes on the Missouri Flat Road approaches and a separate right turn lane on the southbound approach. The Golden Center Drive approaches are single lanes which operate with permitted phasing.

The **Missouri Flat Road / China Garden Road** intersection is located about 2,100 feet south of Golden Center Drive. This unsignalized intersection includes single lanes along Missouri Flat Road and a TWLTL. At the intersection, the TWLTL is replaced with a left turn lane for southbound traffic. The China Garden Road approach consists of a single lane which is stop controlled. A driveway is present along the west side of the intersection.

The **Missouri Flat Road / Industrial Drive** intersection is located about 600 feet south of China Garden Road. This signalized intersection includes single through lanes along Missouri Flat Road with left turn lanes along both approaches. Due to the offset intersection along the side streets, Industrial Drive and a driveway to retail land uses, the left turn phasing along Missouri Flat Road is lead-lag. Westbound traffic from the retail uses entering Missouri Flat Road is provided north of the traffic signal.

The **Missouri Flat Road / Enterprise Drive** intersection is located along a two lane section of Missouri Flat Road. The intersection is presently being signalized which is assumed completed for Existing project conditions. The TWLTL lane along Missouri Flat Road is assumed to be restriped at the intersection to provide dedicated left turn lanes. The eastbound Enterprise Drive approach is a single lane approach, and the driveway opposite Enterprise Drive provides full access from a single lane.

The **Missouri Flat Road / (SR 49) Pleasant Valley Road** intersection is located at the southern end of Missouri Flat Road roughly two miles from the project site. This tee intersection is traffic signal controlled. The Pleasant Valley Road approaches are single through lanes in each direction. The eastbound approach includes two left turn lanes while the westbound approach includes a right turn lane. The two-lane southbound approach along Missouri Flat Road is configured as separate left turn and right turn lanes. The westbound right turn lane includes an overlap phase with the southbound left turn phase while the southbound right turn movement includes an overlap phase with the eastbound left turn phase.

The **Forni Road / Golden Center Drive** intersection is located about 300 feet east of Missouri Flat Road. This unsignalized intersection includes a single lane along westbound Forni Road and a through lane and a right turn lane along eastbound Forni Road. The Golden Center Drive approach consists of a single lane which is stop controlled.

The **Missouri Flat Road / Diamond Springs Parkway** intersection is a future intersection that is part of the Diamond Springs Parkway project. This intersection when completed will consist of a left turn lane, two through lanes and a right turn lane along the eastbound (Missouri Flat Road) and westbound (Diamond Springs Parkway) approaches. The northbound Missouri Flat Road approach will consist of dual left turn lanes and a shared through-right lane. The opposing southbound approach will consist of a single lane. This intersection will be signalized.

Study Area Roadways

The **Mother Lode Drive to Golden Center Drive** segment is a four-lane roadway between Mother Lode Drive and Golden Center Drive. The segment includes a two-way-left-turn lane (TWLTL) from Perks Court to just north of Forni Road. The roadway includes a raised median with left turn lanes between Mother Lode Drive and Perks Court and from Forni Road to Golden Center Drive.

The **Golden Center Drive and China Garden Road** segment is generally a two-lane roadway with a TWLTL between Golden Center Drive and China Garden Road. Upon departing from the Golden Center Drive intersection to the south, a lane drop is present reducing the southbound direction to one lane. Similarly, the approach to the Golden Center Drive intersection consists of a single lane with a TWLTL that widens to two lanes just prior to the intersection. The TWLTL changes into a northbound left turn lane at the intersection. This also occurs in the southbound direction at China Garden Road with the TWLTL becoming a dedicated left turn lane at the intersection.

The **China Garden Road and Pleasant Valley Road** segment is a two-lane roadway with a TWLTL between China Garden Road and Pleasant Valley Road. At the intermediate intersections left turn lanes replace the TWLTL. About 500’ from the Pleasant Valley Road intersection the TWLTL ends and an additional southbound lane is added.

Analysis Criteria

Level of Service Methodology. *Level of Service Analysis* has been employed to provide a basis for describing existing traffic conditions and for evaluating whether project traffic deficiencies exist. Level of Service measures the *quality* of traffic flow and is represented by letter designations from "A" to "F", with a grade of "A" referring to the best conditions, and "F" representing the worst conditions. The guidelines and analyses used for this report follow El Dorado County standards.

Local agencies adopt minimum Level of Service standards for their facilities. El Dorado County identifies LOS E as the acceptable Level of Service on roadways and state highways within the unincorporated areas of the County in the Community Regions and LOS D in the Rural Centers and Rural Regions except as specified in the General Plan. The County's General Plan allows some roadway segments to operate at LOS F. Two segments are along Missouri Flat Road, from US 50 to Mother Lode Drive and from Mother Lode Drive to China Garden Road. Intersections and roadway segments in these segments may operate at LOS F. The analysis techniques presented in the 7th Edition of the *Highway Capacity Manual* (HCM) were used to calculate Level of Service and to provide a basis for describing existing traffic conditions and evaluating project traffic relative to the 'No Project' conditions.

Intersections. Various software programs have been developed to assist in calculating intersection Level of Service, and the level of sophistication of each program responds to factors that affect the overall flow of traffic. In this case, Synchro-SimTraffic software was used for intersection analysis in order to account for the effects of closely spaced traffic signals along Missouri Flat Road. The software is a stochastic model, i.e. randomness is present when running the simulations. The results will vary within discussed on page 8.each scenario and between scenarios. This may result in some intersections having lower delays in the Plus Project scenario than in the No Project scenario. The simulation results contained herein reflect the average of the mean 10 one-hour simulation runs selected from a 20-run sample. Each run employed a 10-minute seeding period.

SimTraffic currently cannot analyze two-stage gap analysis with two-way-left-turn-lanes (TWLTL). According to Trafficware, the program architecture "needs considerable changes to the driver lane choice and gap acceptance methods." This is continuing to be reviewed. Since TWLTL analysis is unavailable using SimTraffic, intersections with TWLTL's were evaluated using Synchro 7th Edition methodology which does analyze gap acceptance with two-way-left-turn-lanes.

The intersection Levels of Service presented in this analysis are based on the weighted average total delay per vehicle for the intersection as a whole at signalized intersections and at locations controlled by all-way stops. The average delay experienced by motorists yielding the right of way is the basis for identification of Level of Service at locations controlled by side street stop signs. Applicable Level of Service thresholds based on average delay are shown in Table 1.

Intersection Level of Service Thresholds of Significance. El Dorado County identifies LOS 'E' as the acceptable Level of Service on roadways and state highways within the unincorporated areas of the County in the Community Regions and LOS D in the Rural Centers and Rural Regions except as specified in the General Plan. The Diamond Springs area is identified as a Community Region. Table TC-2 of the General Plan identifies those county roadways allowed to operate at LOS F. Missouri Flat Road, between US 50 and Mother Lode Drive may operate at LOS F while maintaining a maximum volume to capacity (v/c) ratio of 1.12. Additionally, between Mother Lode Drive and China Garden Road Missouri Flat Road can operate at LOS with a maximum v/c ratio of 1.20.

Specific to General Plan consistency, a traffic deficiency is identified under El Dorado County guidelines if the project causes an intersection to change from LOS E to LOS F. Worsening of conditions at facilities already operating at unacceptable levels of service is also considered a deficiency. The County's General Plan Policy TC-Xe defines worsen as any of the following conditions:

a. a 2% increase in traffic during the a.m. peak hour, p.m. peak hour or daily trips, or
b. the addition of 100 or more daily trips, or
c. the addition of 10 or more trips during the a.m. peak hour or the p.m. peak hour.

The County's current General Plan Policy TC-Xf notes that for all residential subdivisions of five or more parcels that worsens traffic on a County road as defined in Policies TC-Xe [A], [B] or [C] "the County shall condition the project to construct all road improvements necessary to maintain or attain Level of Service standards detailed in this Transportation and Circulation Element based on existing traffic plus traffic generated from the development plus forecasted traffic growth at 10-years from project submittal." For all other discretionary projects that worsen traffic "the County shall condition the project to construct all road improvements necessary to maintain or attain adopted LOS standards."

However, the El Dorado County Superior Court issued a ruling in July 2017 that found certain provisions in Measure E unconstitutional. The court ruled that the previous language contained in Measure Y was still valid as detailed below:

At the time of approval of a tentative map for a single family residential subdivision of five or more parcels that worsens (defined as a project that triggers Policy TC-Xe [A] or [B] or [C]) traffic on the County road system, the County shall do one of the following:

1) condition the project to construct all road improvements necessary to maintain or attain Level of Service standards detailed in this Transportation and Circulation Element based on existing traffic plus traffic generated from the development plus forecasted traffic growth at 10-years from project submittal; or

(2) ensure the commencement of construction of the necessary road improvements are included in the County's 10-year CIP.

For all other discretionary projects that worsen (defined as a project that triggers Policy TC-Xe [A] or [B] or [C] traffic on the County road system, the County shall do one of the following:

(1) condition the project to construct all road improvements necessary to maintain or attain Level of Service standards as detailed in this Transportation and Circulation Element; or
(2) ensure the construction of the necessary road improvements are included in the County's 20-year CIP.

Consistent with Measure E, the County has determined that under current General Plan Policy four scenarios should be analyzed. These include:

- Existing Conditions
- Existing plus Project Conditions
- 2040 Conditions
- 2040 plus Project Conditions

TABLE 1
LEVEL OF SERVICE DEFINITIONS

Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
"A"	Uncongested operations, all queues clear in a single-signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10 sec/veh	Completely free flow.
"B"	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh	Free flow, presence of other vehicles noticeable.
"C"	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh	Ability to maneuver and select operating speed affected.
"D"	Significant congestion of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and ≤ 50 sec/veh	At or near capacity, flow quite unstable.
"F"	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.
Sources: 7th Edition Highway Capacity Manual, Transportation Research Board (TRB).			

Roadway Segments

The County's *Transportation Impact Study Guidelines* presents the Level of Service criterion for roadway segments based on peak hour volumes. These thresholds make use of facility

classifications that are based on the facility type and number of lanes on the facility. The classifications for each roadway that are contained in the Guidelines have been used for this analysis and are presented in Table 2. A deficiency along a roadway occurs when the project causes the roadway to operate below the approved County thresholds.

TABLE 2
EL DORADO COUNTY PEAK HOUR ROADWAY SEGMENT LOS CRITERION

		HCM 2010 Planning Levels Volumes				
Code	**Functional Class Codes (Updated to HCM 2010)**	**A**	**B**	**C**	**D**	**E**
2A	Two-Lane Arterial	-	-	850	1,540	1,650
4AU	Four-Lane Arterial, Undivided	-	-	1,760	3,070	3,130
4AD	Four-Lane Arterial, Divided	-	-	1,850	3,220	3,290
6AD	Six-Lane Arterial, Divided	-	-	2,760	4,680	4,710
4M	Four-Lane Multi-Highway (Two Dir.)	-	2,240	3,230	4,250	4,970
2F	Two Freeway Lanes (One Dir.)	-	2,070	2,880	3,590	4,150
2FA	Two Freeway Lanes + Auxiliary Lane (One Dir.)	-	2,610	3,630	4,520	5,230
3F	Three Freeway Lanes (One Dir.)	-	3,100	4,320	5,380	6,230
3FA	Three Freeway Lanes + Auxiliary Lane (One Dir.)	-	3,640	5,070	6,320	7,310
4F	Four Freeway Lanes (One Dir.)	-	4,140	5,760	7,180	8,310

- 2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, 0.09K-factor and D-factor of 0.6
- Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed 45 mph
- Volumes are both directions unless noted

Intersection Queuing Analysis. The quality of traffic flow can also be affected by queuing at signalized intersections. For this study, the lengths of peak period queues have been identified and compared to available storage in order to determine whether spillover from turn lanes can affect adjoining travel or extend through adjacent intersections. 95th percentile queue lengths have been calculated as a byproduct of the Synchro-SimTraffic simulation. Those locations where the 95th percentile queue exceeds the available storage have also been noted.

Traffic Signal Warrants. The extent to which existing or projected traffic volumes may justify signalization at un-signalized intersections has been determined based on consideration of traffic signal warrant presented in the *Manual of Uniform Traffic Control Devices, 2014*. For this analysis, the volume thresholds associated with Warrant 3 (Peak Hour Volume) have been assessed. The "rural" criteria have been employed based on speed limits in excess of 40 mph.

Public Transit

The El Dorado County Transit Authority (EDCTA) offers local fixed route, regional commuter route, dial-a-ride and para-transit services. Four local fixed routes pass the project site on Missouri Flat Road. These include the #30, the #50x and the Sac Commuter.

The #30 loop route operates Monday through Friday. The route travels along Missouri Flat Road, Pleasant Valley Road and Mother Lode Drive. The route begins at the Missouri Flat Transfer Center, travels south to Pleasant Valley Road and then heads east where it loops along Pearl Place and Racquet Way to return to Pleasant Valley Road. The route then heads west to Mother Lode Drive, travels north to Missouri Flat Road then heads north to Folsom Lake College where it turns around and heads back to Transfer Center. The first bus departs at 7:00 a.m. and operates hourly with the last bus departing the transit center at 6:00 p.m. The route is approximately 55 minutes.

The #50X route is an express route between the Placerville Transfer Station and the Folsom Iron Point light rail station. The route operates Monday through Friday between 6:00 a.m. and 7:00 p.m. Westbound, buses depart the Missouri Flat Transfer Center for Folsom on the hour, beginning at 6:00 a.m. and continuing until 6:00 p.m. The last bus from Placerville arrives at 7:00 p.m. Eastbound, buses depart the Missouri Flat Transfer Center for Placerville on the hour, beginning at 7:00 a.m. with the last bus departing at 7:00 p.m. The last bus from Folsom arrives at 8:00 p.m.

The Sac Commuter provides four morning trips from Park and Ride locations in Western El Dorado County to downtown Sacramento and four return trips in the afternoon during the week. Two additional runs in the reverse commute direction occur in the morning and afternoon. The route begins at the Central Park and Ride off Commerce Way which is about 1¼ mile from the site. This is a transfer location with the #30 route. Three buses depart the Central Park and Ride between 5:10 a.m. and 6:10 a.m. while four buses depart Sacramento for this Park and Ride site between 3:20 p.m. and 5:40 p.m. The route takes about 85 minutes. In the reverse commute two buses depart Sacramento at 6:10 a.m. and 7:10 a.m. arriving about 95 minutes later. In the afternoon buses depart at 2:00 and 3:00 to return to Sacramento.

Two additional routes, the #25 and the #35 operate on Saturdays. The #25 operates between the Missouri Flat Road Transit Center and Pollock Pines while the #35 route operates within Diamond Springs. Currently, El Dorado Transit has temporarily suspended both routes.

The *Western El Dorado County Short-Range and Long-Range Transit Plan Study (2019)* identified improvements for transit service in the Diamond Springs area. Short Range improvements already implemented include extending the #50X to Placerville, eliminating the 6:00 a.m. run of the #30 and implementing a 6:00 p.m. run “on request”. No other short-term improvements affecting the project area were identified. Expanding the #50X to include Saturday service is identified for Fiscal Year (FY) 2022-23, however, it has not yet be implemented. No long-range improvements were identified in the Diamond Springs area.

Pedestrian and Bicycle Facilities

Sidewalk is present along the east side of Missouri Flat Road, from Plaza Drive north of US 50 to south of Golden Center Drive. Along the west side of Missouri Flat Road sidewalk is present from Plaza Drive to about 600 feet south of Mother Lode Drive, and from about 700 feet north of Forni Road to about 400 feet south of Golden Center Drive at the trailhead of the El Dorado Trail. Sidewalks are also present along the perimeters of each of the retail developments in the Missouri Flat Road / Forni Road intersection but is not present along the project frontage along Forni Road. The El Dorado County Active Transportation Plan proposes sidewalk throughout the Diamond Springs area, including along Missouri Flat Road to Pleasant Valley Road, along Pleasant Valley Road, Mother Lode Drive and the proposed Diamond Springs Parkway, and along various internal streets within the area.

Designated bicycle facilities exist in the vicinity of the project. Class II bike lanes are present along Missouri Flat Road from Plaza Drive south to Golden Center Drive. A Class I shared-use facility is present along the El Dorado Trail east and west of Missouri Flat Road. Narrow paved shoulders are present intermittently along Missouri Flat Road and Forni Road and are not designated bicycle lanes. Proposed bicycle improvements in the vicinity include Class II bicycle lanes along Missouri Flat Road between Golden Center Drive and Pleasant Valley Road, Mother Lode Drive, between Lindberg Road and Missouri Flat Road, and Diamond Springs Parkway.

Class III bicycle routes are also proposed along Golden Center Drive, Lindberg Drive and Enterprise Drive while a Class IV separated bike lane is proposed along Missouri Flat Road from the El Dorado Trailhead to Mother Lode Drive.

Existing Traffic Operating Conditions

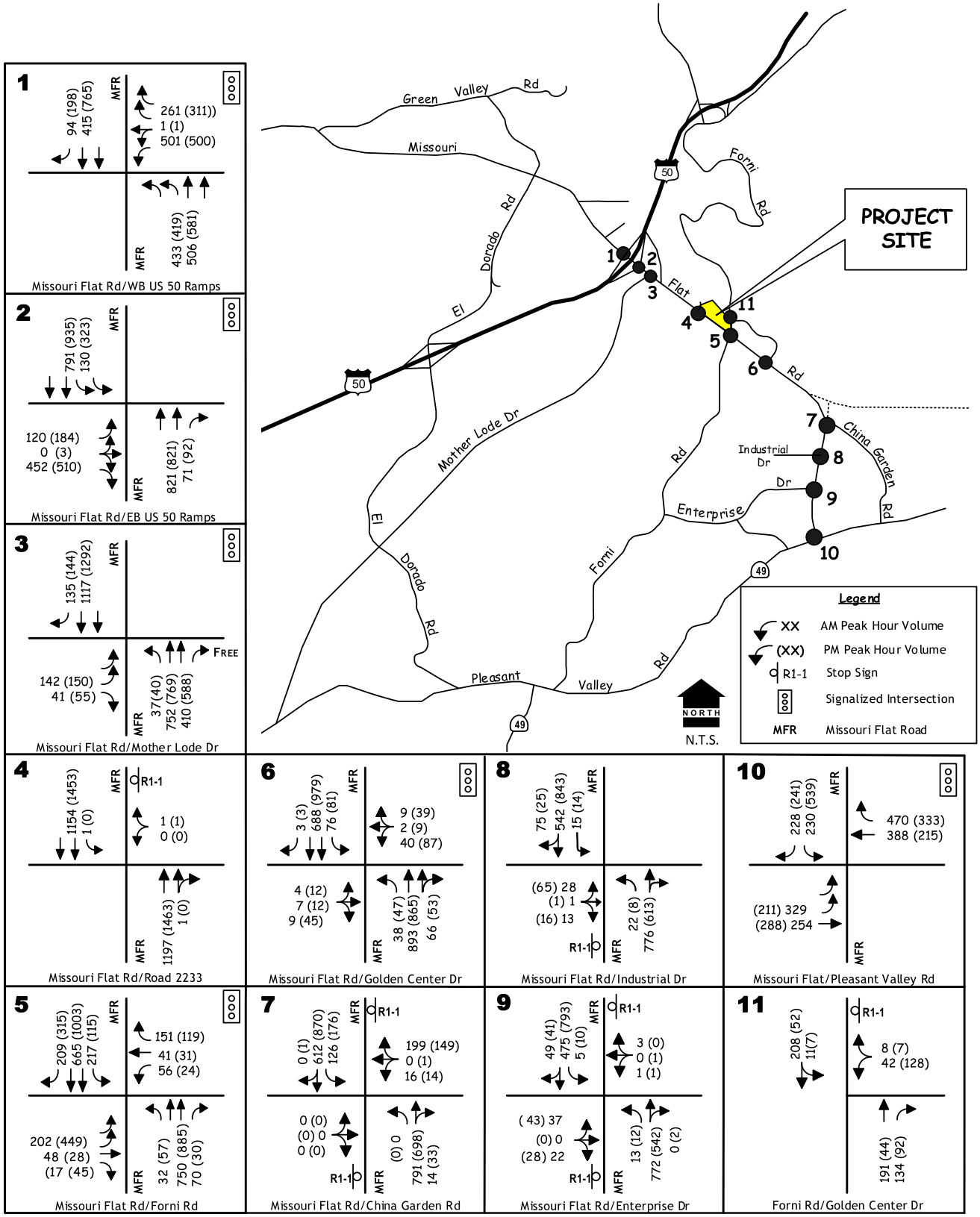
Traffic Volume Counts. Traffic counts were completed during the first week of May 2023 during the midweek while school was in session. The counts were conducted in the weekday morning peak period (6:00 a.m. to 9:00 a.m.) and in the evening peak period (4:00 to 7:00 p.m.). Additionally, as the site is near Herbert Green Middle School a weekday afternoon count in the peak period (2:00 p.m. to 4:00 p.m.) was also conducted. The afternoon turning movements were conducted in the school vicinity, at four local intersections. Four intersections were analyzed for mid-afternoon conditions including Forni Road / Golden Center Drive, Missouri Flat Road / Forni Road, Missouri Flat Road / Golden Center Drive and Missouri Flat Road / Road 2233. Intersection turning movements are presented in Figures 4A and 4B.

Intersection Levels of Service. Table 3 summarizes current operating Levels of Service at the study area intersections during the a.m. and p.m. peak hours based on the mean for 10 simulation runs conducted for each time period. County supplied traffic signal timing plans were used at existing intersections. All study intersections except the westbound approach of the Missouri Flat Road / China Garden Road intersection operate with acceptable Levels of Service during the a.m.

and p.m. peak hours. The westbound China Garden Road approach operates at LOS F in the a.m. (110.6 seconds per vehicle [spv] and p.m. peak hour (120.7 spv).

Table 4 summarizes the current operating LOS during the afternoon at the four local intersections. Unlike the a.m. and p.m. peak hour scenarios that simulated traffic along Missouri Flat Road between US 50 and Pleasant Valley Road, this mid-day analysis is specific to these four intersections. Therefore, Synchro software was used to calculate Level of Service.

In the period immediately after school the Forni Road / Golden Center Drive intersection can back up. This is an effect of the congestion associated with the drop-off / pick-up zone inside Herbert Green Middle School (HGMS) and is typical of schools where access to the school zones is limited.



EXISTING TRAFFIC VOLUMES
AND LANE CONFIGURATIONS

EXISTING
MID-DAY VOLUMES

EXISTING MIDDAY TRAFFIC VOLUMES AND LANE CONFIGURATION

FIGURE 4B

FLECKER ASSOCIATES
7500-01 7/25/2023

At HGMS most traffic enters and exits the site along Forni Road from the south. Congestion occurs when the number of parents arriving to pick up students exceeds the available parking and loading supply. Under those circumstances waiting motorists can form queues that extend back into the adjoining street. This results in short term delays. However, over an entire hour these delays become contributory, but not necessarily significant to the overall operation of the intersection. All study intersections currently operate with acceptable Levels of Service during the afternoon, at LOS C or better.

Traffic Signal Warrants. The Missouri Flat Road / China Garden Road intersection meets the peak hour warrant in the a.m. and p.m. peak hours. The Missouri Flat Road / Road 2233 and Forni Road / Golden Center Drive intersections were reviewed for a.m., p.m. and midday periods. Neither of these intersections meet the peak hour traffic signal warrant. Warrant 5, "School Crossing" was also reviewed for the Forni Road / Golden Center Drive intersection. While the midday traffic showed that there were 68 pedestrians crossing Golden Center Drive 65 occurred in a 15-minute period. A full analysis was not undertaken as this is beyond the scope of the Creekside Plaza project; however, as almost all pedestrians cross in a 15-minute period it is unlikely that the intersection would meet the criteria for a traffic signal. The CA MUTCD does note that implementation of other measures should be considered such as warning signs, flashers, speed zones and school crossing guards. Warning signs and speed zones are already present along the approaches. Further enhancements, if appropriate, could include a crossing guard at the end of school.

TABLE 3
EXISTING PEAK HOUR LEVELS OF SERVICE AT INTERSECTIONS

Location	Control	AM Peak Hour		PM Peak Hour		Traffic Signal Warranted?
		LOS	Average Delay	LOS	Average Delay	
1. Missouri Flat Rd / WB US 50 ramps	Signal	C	24.6	C	23.6	N/A
2. Missouri Flat Rd / EB US 50 ramps	Signal	B	13.7	B	19.6	N/A
3. Missouri Flat Rd / Mother Lode Dr	Signal	A	7.9	A	8.7	N/A
4. Missouri Flat Rd / Road 2233						
SB Left	WB Stop	(C)	(21.1)	---	---	No
WB		(B)	(13.5)	---	---	
5. Missouri Flat Rd / Forni Rd	Signal	B	18.9	C	22.8	N/A
6. Missouri Flat Rd / Golden Center Dr	Signal	A	6.9	B	12.0	N/A
7. Missouri Flat Rd / China Garden Rd						
NB Left		---	---	---	---	
SB Left	WB Stop	(B)	(10.8)	(B)	(10.7)	Yes*
EB		---	---	---	---	
WB		(F)	(110.6)	(F)	(120.7)	
8. Missouri Flat Rd / Industrial Dr	Signal	B	18.5	B	18.7	N/A
9. Missouri Flat Rd / Enterprise Dr	Signal	A	6.1	A	9.1	N/A

TABLE 3
EXISTING PEAK HOUR LEVELS OF SERVICE AT INTERSECTIONS (cont.)

Location	Control	AM Peak Hour		PM Peak Hour		Traffic Signal Warranted?
		LOS	Average Delay	LOS	Average Delay	
10. Missouri Flat Rd /SR 49 (Pleasant Valley Rd)	Signal	B	18.7	B	15.7	N/A
11. Forni Rd / Golden Center Dr						
SB Left	WB Stop	A	2.8	A	2.4	No
WB		A	2.4	A	5.3	

* meets peak hour warrant in AM and PM peak hours
(xx) – delay and level of service using HCM 7th Edition including TWLTL analysis
Red indicated threshold exceeded

TABLE 4
MID-AFTERNOON PEAK HOUR LEVELS OF SERVICE
EXISTING CONDITIONS

Location	Control	Existing Mid-Afternoon Peak Hour		Traffic Signal Warranted?
		LOS	Average Delay	
4. Missouri Flat Rd / Road 2233	WB Stop			No
SB Left		---	---	
WB		---	---	
5. Missouri Flat Rd / Forni Rd	Signal	C	23.6	N/A
6. Missouri Flat Rd / Golden Center Dr	Signal	B	14.4	N/A
11. Forni Rd / Golden Center Dr	WB Stop			No
SB Left		A	8.5	
WB		C	15.3	

Intersection Queues. Tables 5 and 6 presents information regarding current peak period queuing in lanes at signalized study intersections. In each case, the available storage has been presented along with current peak hour traffic volumes and the 95th percentile queue length. On multiple lane approaches the longest queue amongst a group of common lanes has been noted.

Most intersections have left turn lane storage capacity that can accommodate peak period queues. Those 95th percentile queues with length exceeding the available storage have been highlighted. It is assumed that additional vehicles may queue within the turn lane taper without blocking the adjacent lane; the number of vehicles queuing in the taper is based on the taper length and width. At the US 50 / Missouri Flat Road interchange through movement queues have also been identified due to the short spacing between the westbound ramp intersection to Mother Lode Drive. The 95th percentile queue exceeds available storage in three locations.

TABLE 5
EXISTING PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Storage Length* (feet)	AM Peak Hour		PM Peak Hour	
		VPH	Queue (feet)	VPH	Queue (feet)
1. Missouri Flat Road / WB US 50 ramps					
NB left turn	170	433 (2)	166	419 (2)	163
NB through	360	506 (2)	345	581 (2)	337
SB through	520	415 (2)	193	765 (2)	284
WB left turn	410	501 (2)	202	500 (2)	206
WB right turn	410	261 (2)	104	311 (2)	115
2. Missouri Flat Road / EB US 50 ramps					
NB through	160	821 (2)	191	821 (2)	192
NB right turn	175	71	99	92	122
SB left	180	130 (2)	115	323 (2)	184
SB through	380	791 (2)	179	935 (2)	270
EB left+through+right turn	540	572 (3)	197	697 (3)	231
3. Missouri Flat Road / Mother Lode Drive					
NB left turn	180	37	65	40	56
SB through	140	1,117 (2)	170	1,292 (2)	185
SB right turn	130	135	69	144	87
5. Missouri Flat Road / Forni Road					
NB left turn	280	32	55	57	128
NB right turn	210	70	100	30	93
SB left turn	325	217	213	115	134
SB right turn	205	209	148	315	188
EB left turn	290	202 (2)	102	449 (2)	211
WB left turn	205	56	74	24	52
6. Missouri Flat Road / Golden Center Drive					
NB left turn	120†	38	53	47	64
SB left turn	180	76	90	81	128
8. Missouri Flat Road / Industrial Drive					
NB left turn	100†	22	94	8	56
SB left turn	100†	15	56	14	43
9. Missouri Flat Road / Enterprise Drive					
NB left turn	100†	13	35	12	37
SB left turn	100†	5	28	10	40
10. Missouri Flat Road / SR 49 (Pleasant Valley Rd)					
SB left turn	600	230	182	539	235
SB right turn	600	228	109	241	79
EB left turn	180†	329 (2)	179	211 (2)	137
WB right turn	255	470	239	333	113

Highlighted values indicate queue length in excess of available storage + taper

* includes portion of taper without blocking adjacent lane † length prior to becoming TWLTL

TABLE 6
MID-AFTERNOON PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS
EXISTING CONDITIONS

Location	Storage Length* (feet)	Existing Mid-Afternoon Peak Hour	
		VPH	Queue (feet)
5. Missouri Flat Road / Forni Road			
NB left turn	280	54	135
NB right turn	210	29	<25
SB left turn	325	120	120
SB right turn	205	319	133
EB left turn	290	394	130
WB left turn	205	26	103
6. Missouri Flat Road / Golden Center Drive			
NB left turn	120†	60	30
SB left turn	180	82	43

Existing Roadway Segment Levels of Service. Table 7 summarizes the Levels of Service based on the current traffic volumes on study area roads with the existing roadway configuration. Applicable Level of Service thresholds and roadway classifications are presented. Missouri Flat Road, between Golden Center Drive and China Garden Drive includes both two-lane and multi-lane segments, the majority being two-lane; this segment was evaluated for a worst-case scenario under the two-lane segment volume threshold. The segments between Mother Lode Drive and Golden Center Drive and China Garden Road and Pleasant Valley Road operate within acceptable LOS thresholds, operating at LOS D or better. The segment between Golden Center Drive to China Garden Road operates at LOS F in both peak periods; however, the County policy for Missouri Flat Road between Mother Lode Drive and China Garden Road considers the segment to be deficient with a v/c ratio over 1.20. This segment has v/c ratios of 1.06 in the a.m. peak hour and 1.16 in the p.m. peak hour; thus, the segment is not considered deficient.

TABLE 7
MISSOURI FLAT ROAD SEGMENT LEVELS OF SERVICE
EXISTING CONDITIONS

Roadway	Location	Facility Classification	Standard		Exist Mid-Week Condition	
			Hourly Volume Threshold	LOS	Roadway Hourly Volume	LOS
Missouri Flat Road	Mother Lode Dr to Golden Center Dr	Four-Lane Multi Lane Highway (4M)	4,970	E	2,351 (2,737)	C (C)
	Golden Center Dr to China Garden Rd	Two-Lane Highway (2A)	1,650	E	1,734 (1,917)	**F** **(F)**
	China Garden Rd to Pleasant Valley Rd	Two-Lane Highway (2A)	1,650	E	1,341 (1,438)	D (D)
AM (PM) **Bold** indicates LOS threshold exceeded and v/c threshold not exceeded						

PROJECT CHARACTERISTICS

The development of this project will attract traffic to the project site. The amount of additional traffic on a particular section of the street network is dependent upon two factors:

- Trip Generation, the number of new trips generated by the project, and
- Trip Distribution and Assignment, the specific routes that the new traffic takes.

Trip Generation

Trip generation is determined by identifying the type and size of land use being developed. Recognized sources of trip generation data may then be used to calculate the total number of trip ends resulting from the day to day operation of the businesses in the project.

The trip generation for this project was calculated using trip generation rates published in the *Trip Generation Manual* (Institute of Transportation Engineers, 11th Edition, 2021). The project consists of a 12 fueling position gas station with 2,880 square foot (sf) C-store and a single tunnel automated car wash on the north side of the site. The south side of the site includes a 2,200 sf food fast food restaurant with drive-through lane and 7,950 sf of retail space. The retail space includes a 6,600 sf building in the southwest corner of the site adjacent to the Missouri Flat Road / Forni Road intersection and a 1,350 sf pad attached to the fast food building pad. Applicable ITE rates are found in categories 945 (Gas Station with Convenience Store), 822 (Strip Retail), 934 (Fast Food with Drive-Through Lane) and 948 (Automated Car Wash). The trip generation is shown in Table 8.

Limited data is available for automated car washes. The report prepared in 2022 by KDA conducted a trip generation analysis in 2020 to establish trip generation rates for a project that

included a tunnel car wash along Green Valley Road. An ITE rate is available for the p.m. peak hour; however, it is based on limited data; no daily or a.m. data is available. KDA conducted a count at a local car wash in Sacramento as well as a web search to identify additional projects throughout the United States where survey data was available to establish a larger data pool to determine trip rates. Four data points and the ITE rate was used to establishing trip rates. Averaging these five data points resulted in trip rates on a per tunnel basis of 86 midweek p.m. peak hour trips and 142 Saturday mid-day peak hour trips. The p.m. peak hour rate is also relatively consistent with the *San Diego Traffic Generators (SANDAG)* rate of 81 trips (9% of 900 daily trips per site).

A.m. and midweek mid-day trip generation data is not available in *Trip Generation*. An online search also produced no results. In 2019 KDA also conducted a Monday a.m. peak hour count at a Kelly's Car Wash site in Sacramento. The count showed 20 inbound and 14 outbound trips. This is a limited count, but it is consistent with the SANDAG projected rate of 36 a.m. trips (4% of 900 daily trips per site). These observed rates were used.

With regard to the projected daily trips, using the a.m. and p.m. peak hour proportions for LU 949, Car Wash / Detail Center relative to the daily rate, the daily rate is 18.2 times higher than the a.m. rate and 11.5 times higher than the p.m. rate. These rates were then applied to the average trips for the tunnel car wash and then averaged. The projected daily rate based on the a.m. rate results in 617 daily trips while the daily trips based on the p.m. peak hour is 983 trips. Averaging these yields a daily trip rate of 800 trips which was used for the analysis. This daily rate was used with hourly trip percentage rates to project mid-day car wash trips.

Trips generated by retail commercial projects fit into two categories. Some trips will be made by patrons who would not otherwise be on the local street system and who go out of their way to reach the site. These are "new" trips. Other trips will be made by patrons who are already in the roadway network and stop by the site as part of a trip made for another purpose. These "pass-by" trips do not add traffic to the overall system. ITE research has suggested typical "pass-by" percentages for various retail land uses. Internally captured trips, those that visit the different uses within the site were assumed to be present between the gas station and car wash. Table 8 presents the "pass-by" trips and internal trips used.

Trip generation for mid-afternoon was calculated using trip generation rates published in *Trip Generation*. Applicable rates for hourly variation of traffic for an average weekday were used in conjunction with the projected daily traffic to project mid-afternoon project traffic conditions. Hourly variation values are available for the gas station/C-Store, fast food restaurant and strip retail traffic. The trip generation is shown in Table 9.

The site is projected to create 5,466 daily trips, 346 a.m. peak hour trips, 434 p.m. peak hour trips and 361 mid-day trips. After considering internal trips, those trips being made to multiple uses by a single vehicle, and pass-by trips, those vehicles already in the roadway network passing by the site, the net new traffic projected as a result of the project is expected to be 2,520 additional daily

trips, 154 new a.m. peak hour trips, 209 additional p.m. peak hour trips and 169 additional mid-day trips.

TABLE 8
AM / PM PEAK HOUR TRIP GENERATION

Land Use	Unit Quantity	Size	Trips Per Unit						
			Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Gas Station with Convenience Store	VFP	12	265.12	50%	50%	16.06	50%	50%	18.42
Strip Retail	KSF	7.95	54.45	60%	40%	2.36	50%	50%	6.59
Fast Food with Drive-Through	KSF	2.25	467.48	51%	49%	44.61	52%	48%	33.03
Tunnel Car Wash	EA	1	800†	59%	41%	34⁑	50%	50%	86.00‡
Gas Station with Convenience Store			**3,181**	96	96	**193**	111	111	**221**
Strip Retail			**433**	11	8	**19**	26	26	**52**
Fast Food with Drive-Through			**1,052**	51	49	**100**	39	36	**74**
Tunnel Car Wash			**800**	20	14	**34**	43	43	**86**
Sub-Total Trips			**5,466**	179	167	**346**	218	215	**434**
Internal Trips									
Gas Station with Convenience Store	5%		(159)	(5)	(5)	(10)	(6)	(6)	(11)
Strip Retail	5%		(22)	(1)	(0)	(1)	(1)	(1)	(3)
Fast Food with Drive-Through	5%		(53)	(3)	(2)	(5)	(2)	(2)	(4)
Tunnel Car Wash	25%		(200)	(4)	(4)	(9)	(11)	(11)	(22)
Sub-Total Trips			**(433)**	(12)	(12)	**(24)**	(20)	(19)	**(39)**
Pass-By Trips									
Gas Station *(59% Daily, 62% AM, 56% PM)*◊			(1,783)	(57)	(57)	(114)	(59)	(59)	(118)
Strip Retail *(22% Daily, 10% AM, 34% PM)**			(90)	(1)	(1)	(2)	(8)	(8)	(17)
Fast Food with Drive-Through *(49% Daily, 48% AM, 50% PM)*◊			(490)	(23)	(22)	(46)	(18)	(17)	(35)
Tunnel Car Wash *(25% Daily, 25% AM, 25% PM)*Δ			(150)	(4)	(3)	(6)	(8)	(8)	(16)
Total Pass-By Trips			**(2,513)**	(85)	(83)	**(167)**	(94)	(92)	**(186)**
Net New Trips			**2,520**	**82**	**73**	**154**	**105**	**104**	**209**

KSF – thousand square feet † no data available for LU 948; used LU 949 (Car Wash and Detail Center)
⁑ observed data ‡ average of compiled rates ◊ ITE Trip Generation Handbook, 3rd Ed
* ITE Trip Generation Handbook, 3rd Ed PM; AM assumed 10%
Δ estimated Numbers may not match due to rounding

TABLE 9
MID-DAY TRIP GENERATION

Land Use	Unit Quantity	Size	Trips Per Unit					
			Daily	Hourly Variation		Mid-Afternoon Peak Hour		
				In	Out	In	Out	Total
Gas Station with Convenience Store	VFP	12	265.12	6.1%	5.8	97	92	189
Strip Retail	KSF	7.95	54.45	6.1%	6.1%	13	13	26
Fast Food with Drive-Through	KSF	2.25	467.48	5.9%	6.5%	31	34	65
Tunnel Car Wash	EA	1	800†	9.7%	10.2%	39	41	80
Sub-Total Trips						**180**	**180**	**361**
Internal Trips								
Gas Station with Convenience Store		5%				(5)	(5)	(9)
Strip Retail		5%				(1)	(1)	(1)
Fast Food with Drive-Through		5%				(2)	(2)	(3)
Tunnel Car Wash		25%				(10)	(10)	(20)
Sub-Total Trips						**(17)**	**(17)**	**(34)**
Pass-By Trips								
Gas Station *(59% Daily, 62% AM, 56% PM)◊*						(54)	(52)	(106)
Strip Retail *(22% Daily, 10% AM, 34% PM)**						(3)	(3)	(6)
Fast Food with Drive-Through *(49% Daily, 48% AM, 50% PM)◊*						(14)	(16)	(30)
Tunnel Car Wash *(25% Daily, 25% AM, 25% PM)Δ*						(7)	(8)	(15)
Total Pass-By Trips						**(78)**	**(79)**	**(157)**
Net New Trips						**84**	**85**	**169**

KSF – thousand square feet
† no data available for LU 948; used LU 949 (Car Wash and Detail Center)
◊ ITE Trip Generation Handbook, 3rd Ed
Δ estimated
* ITE Trip Generation Handbook, 3rd Ed PM; AM assumed 10%
Numbers may not match due to rounding

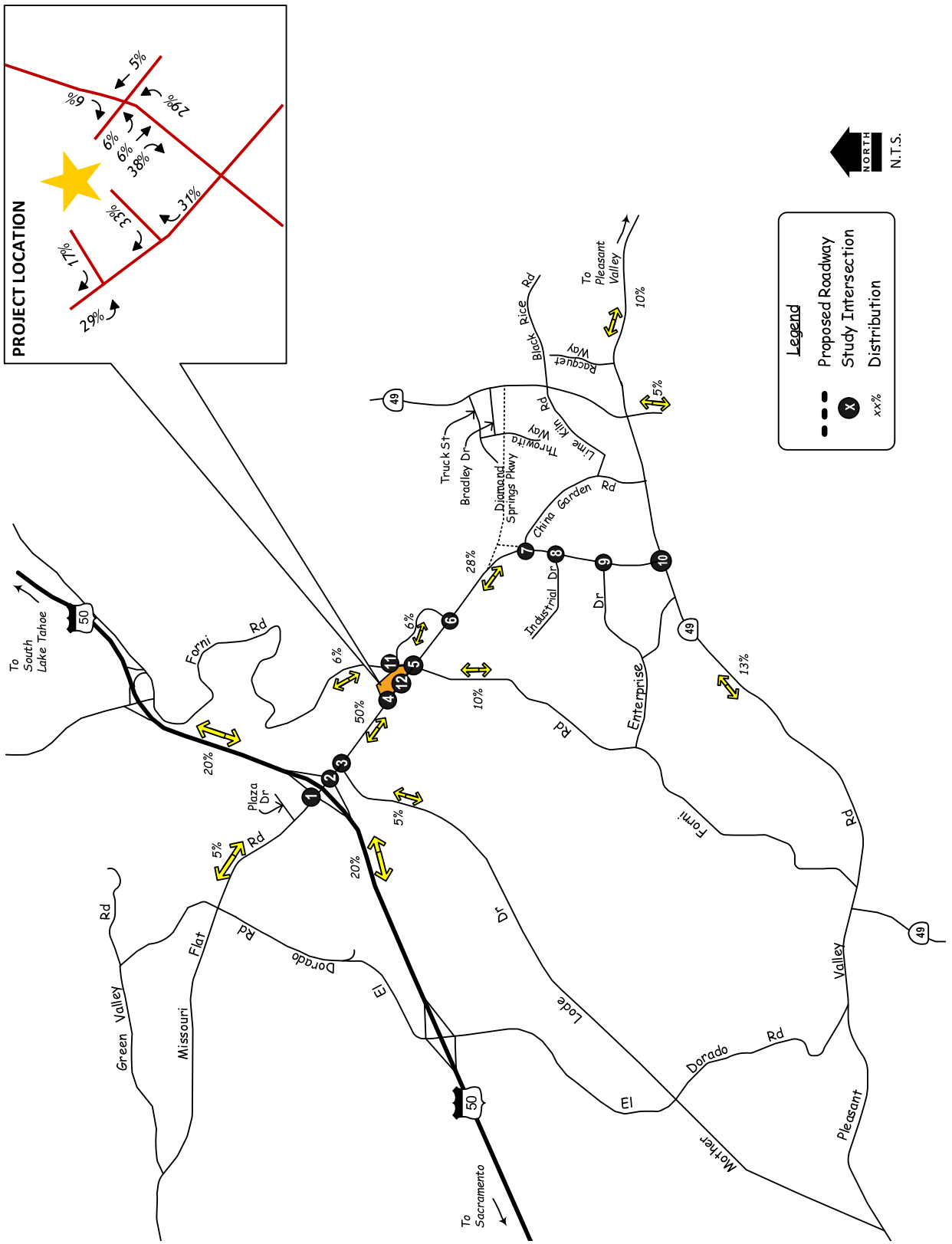
Trip Distribution & Assignment

Two trip distribution patterns were applied to trips related to the Project. One pattern was applied to Existing (i.e., Existing Plus Project) and another pattern was applied to Long-Term (2040) Conditions. Table 10 presents the project trip distributions.

Existing Conditions. To evaluate the traffic related effects of the Project, trips that would be generated by the Project were distributed onto the roadway network. Trip distribution simulates the geographical pattern of travel, matching trips generated by one type of land use (e.g. residential) with trips generated by other types of land uses (e.g., education, employment, and shopping). The traffic distribution is shown in Figure 5 while the generated traffic volumes are shown in Figures 6A and 6B.

TABLE 10
PROJECT TRIP DISTRIBUTION

Direction	Route	Distribution	
		Existing	2040
North	Missouri Flat Road, north of US 50	5%	5%
South	East on Pleasant Valley Road	15%	---
	West on Pleasant Valley Road	13%	13%
West	US 50 west of Missouri Flat Road	20%	20%
	Mother Lode Drive west of Missouri Flat Road	5%	5%
	Forni Road west of Missouri Flat Road	10%	10%
East	US 50 east of Missouri Flat Road	20%	20%
	Forni Road east of Missouri Flat Road	6%	6%
	Diamond Springs Parkway	---	15%
Internal along Missouri Flat Road	Golden Center Drive	6%	6%
Total		100%	100%

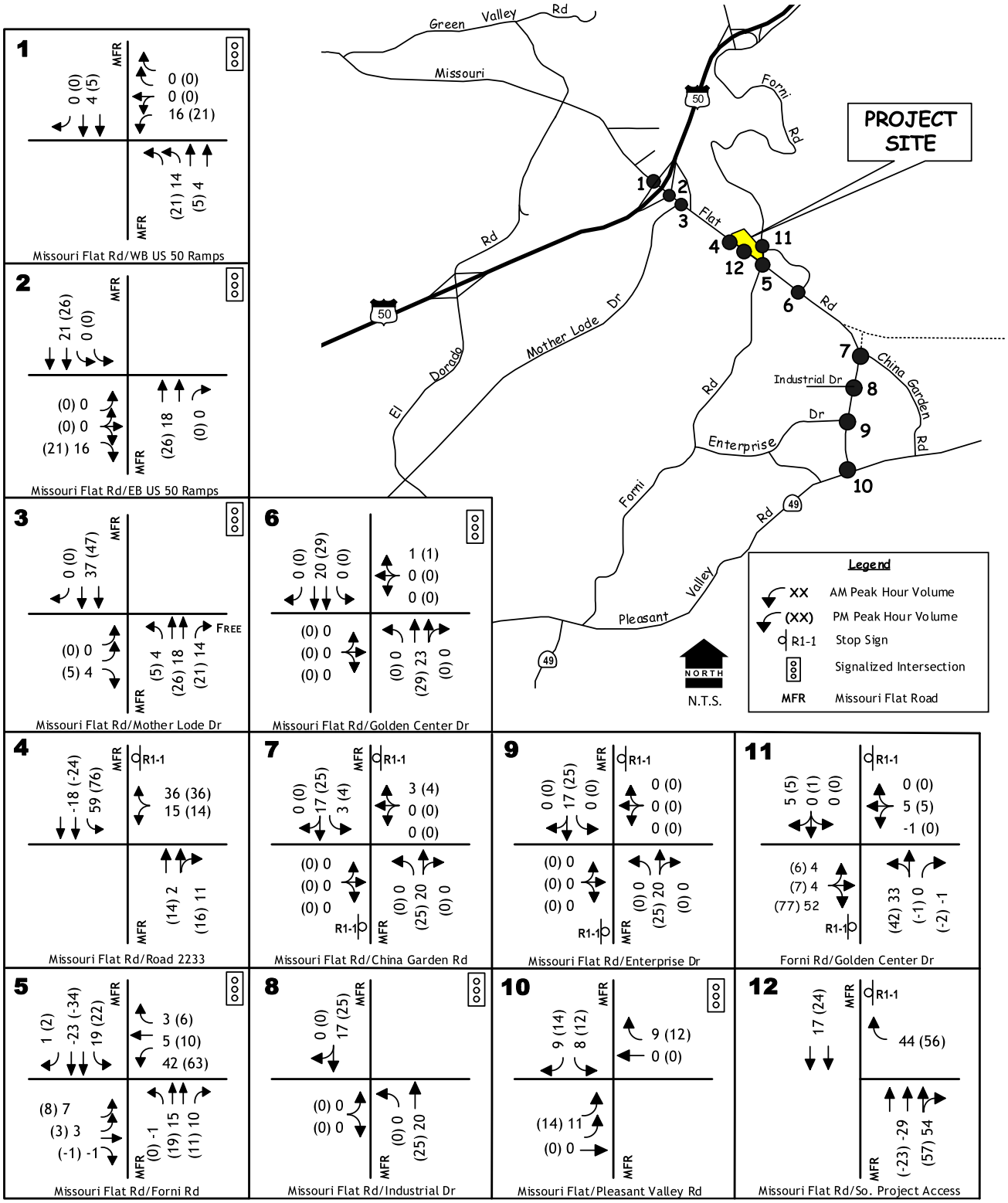


PROJECT TRIP DISTRIBUTION

FIGURE 5

FLECKER ASSOCIATES | 7500-01 | 7/25/2023 | *Creekside Plaza Traffic Impact Analysis*

PD-R21-0002/CUP21-0004/P-E25-0001 CREEKSIDE PLAZA ARCO
EXHIBIT S - TRAFFIC IMPACT ANALYSIS



PROJECT ONLY
TRAFFIC VOLUMES EXISTING SCENARIOS

EXISTING MIDDAY PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATION

FIGURE 6B

FLECKER ASSOCIATES 7500-01 7/25/2023

PROJECT TRAFFIC ANALYSIS

Existing Plus Project Conditions

Traffic Volumes The traffic conditions occurring with development of the project uses on the site have been identified by superimposing project traffic onto existing background conditions. Figures 7A and 7B displays the "Existing Plus Project" traffic volumes at each study intersection in the a.m., p.m. and midday peak hours.

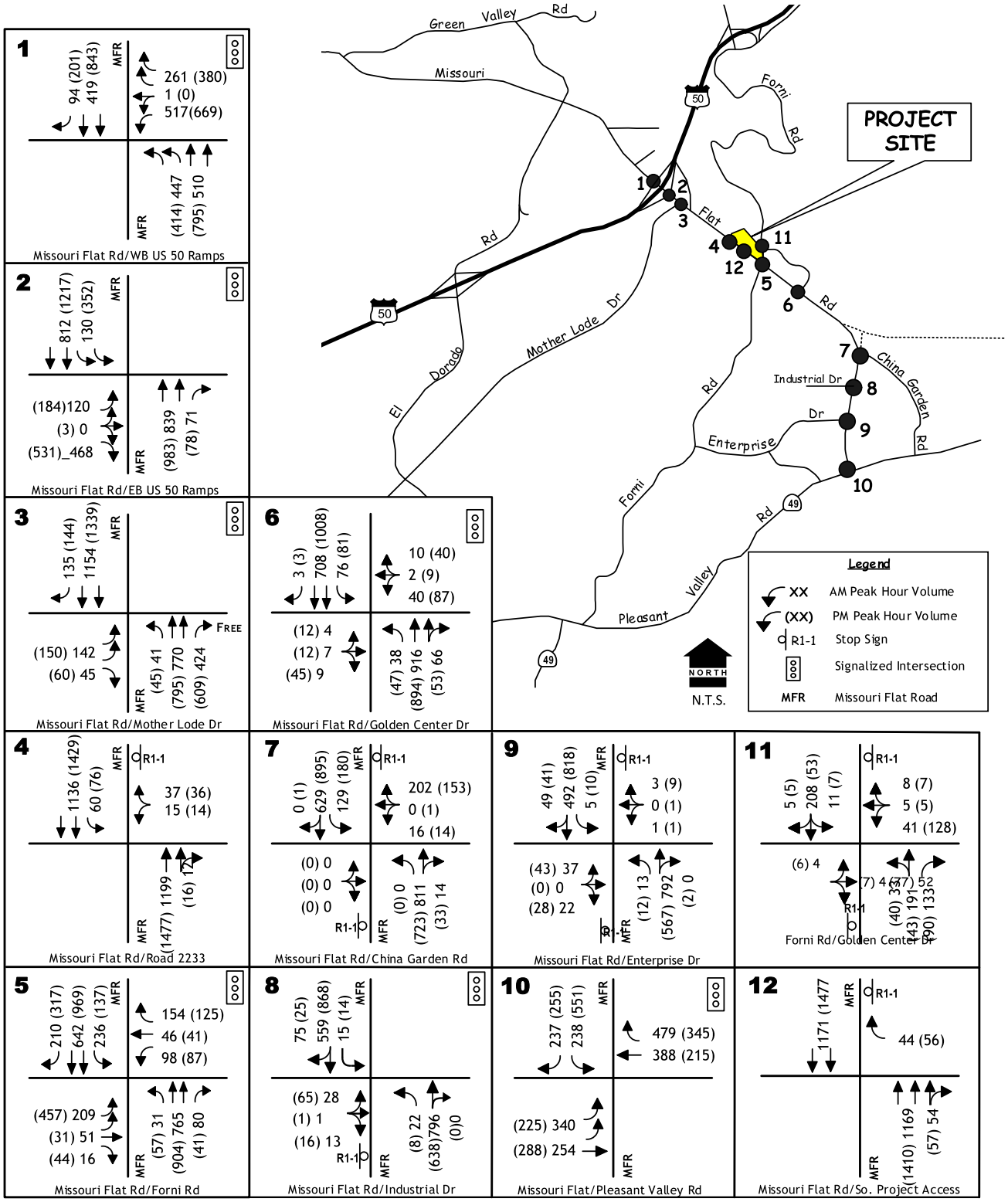
Circulation System Improvements. Figures 7A and 7B also present the intersection geometry and traffic controls resulting from implementation of the project's planned improvements along Missouri Flat Road. Currently, three northbound lanes depart the Missouri Flat Road / Forni Road intersection. The third lane is dropped about 200' north of the intersection. The third lane will be extended along the project frontage with a mandatory right turn at Road 2233. Full access along Road 2233 will remain while the proposed access point along Missouri Flat Road will provide right-in, right-out access only. A third access, along Forni Road will be constructed and become the fourth leg of the existing Forni Road / Golden Center Drive intersection.

Intersection Levels of Service. Intersection Levels of Service were calculated and used as the basis for evaluating project conditions. Existing traffic signal timing plans were continued at signalized intersections. Tables 11 and 12 display the peak hour Levels of Service at each study intersection and compares existing Levels of Service with those accompanying the project. All intersections except the Missouri Flat Road / China Garden Road intersection will continue to operate above the minimum El Dorado County standard (i.e., LOS E or better). The Missouri Flat Road / China Garden Road intersection will operate with the westbound approach at LOS F (132.5 spv) in the a.m. peak hour and LOS F (221.0 spv) the p.m. peak hour.

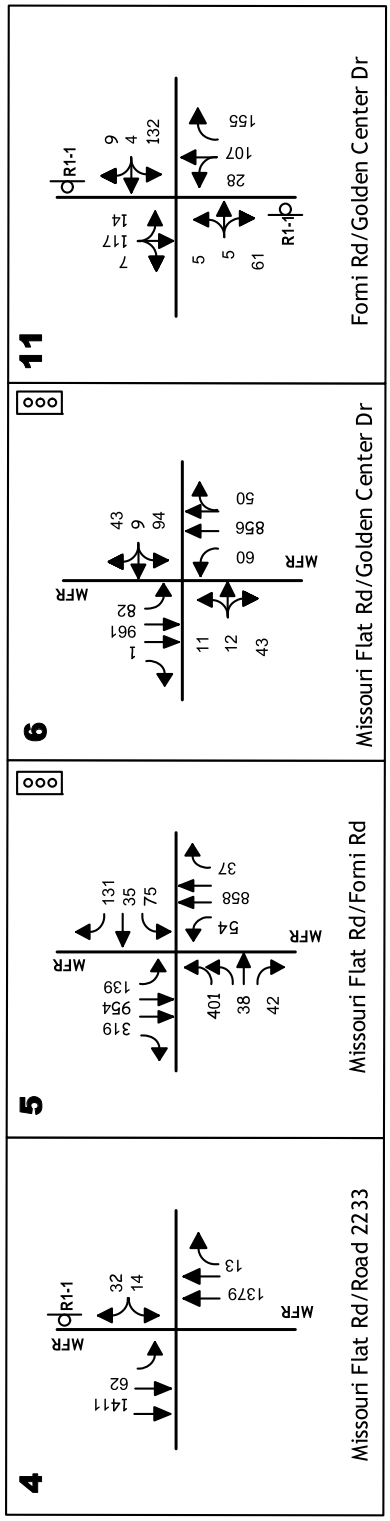
Traffic Signal Warrants. Existing Plus Project traffic volumes at unsignalized intersections were compared to peak hour warrant requirements to determine whether traffic signals may be needed. The Missouri Flat Road / China Garden Road intersection will meet the peak hour warrant in the a.m. and p.m. peak hours.

Intersection Queues. Tables 13 and 14 identify peak period queues assuming the addition of project trips. Those 95th percentile queues with lengths exceeding the available storage have been highlighted. As previously noted through movement queues at the US 50 interchange have been identified due to the short spacing between the westbound ramp intersection to Mother Lode Drive. Under Existing Plus Project conditions five locations will exceed the available storage. Four of these occur within the US 50 interchange area. The fifth location is eastbound Pleasant Valley Road at Missouri Flat Road where the queue exceeds the storage by 12 feet.

PD-R21-0002/CUP21-0004/P-E25-0001 CREEKSIDE PLAZA ARCO
EXHIBIT S - TRAFFIC IMPACT ANALYSIS



EXISTING PLUS PROJECT
TRAFFIC VOLUMES AND LANE CONFIGURATIONS



EXISTING PLUS MIDDAY TRAFFIC VOLUMES AND LANE CONFIGURATION

EXISTING PLUS PROJECT TRAFFIC MID-DAY

FIGURE 7B

FLECKER ASSOCIATES
7500-01 7/25/2023

TABLE 11
PEAK HOUR INTERSECTION LEVELS OF SERVICE
EXISTING PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour				PM Peak Hour				Traffic Signal Warranted?
		Existing		Ex Plus Project		Existing		Ex Plus Project		
		LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	
1. Missouri Flat Rd / WB US 50 ramps	Signal	C	24.6	C	25.6	C	23.6	C	24.0	N/A
2. Missouri Flat Rd / EB US 50 ramps	Signal	B	13.7	B	14.2	B	19.6	C	20.4	N/A
3. Missouri Flat Rd / Mother Lode Dr	Signal	A	7.9	A	8.6	A	8.7	A	9.2	N/A
4. Missouri Flat Rd / Road 2233	WB Stop									No
SB Left		(C)	(21.1)	(B)	(12.9)	---	---	(C)	(15.5)	
WB		(B)	(13.5)	(C)	(22.6)	---	---	(D)	(29.4)	
5. Missouri Flat Rd / Forni Rd	Signal	B	18.9	C	26.5	C	22.8	C	25.1	N/A
6. Missouri Flat Rd / Golden Center Dr	Signal	A	6.9	A	9.2	B	12.0	B	12.5	N/A
7. Missouri Flat Rd / China Garden Rd	WB Stop									Yes*
NB Left		---	---	---	---	---	---	---	---	
SB Left		(B)	(10.8)	(B)	(11.0)	(B)	(10.7)	(B)	(11.0)	
EB		---	---	---	---	---	---	---	---	
WB		(F)	(110.6)	(F)	(132.5)	(F)	(120.7)	(F)	(156.0)	
8. Missouri Flat Rd / Industrial Dr	Signal	B	18.5	B	17.8	B	18.7	B	19.0	N/A

* meets peak hour warrant in AM and PM peak hours
(xx) – delay and level of service using HCM 7th Edition including TWLTL analysis
Red indicated threshold exceeded

TABLE 11 (cont'd)
PEAK HOUR INTERSECTION LEVELS OF SERVICE
EXISTING PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour				PM Peak Hour				Traffic Signal Warranted?
		Existing		Ex Plus Project		Existing		Ex Plus Project		
		LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	
9. Missouri Flat Rd / Enterprise Dr	Signal	A	6.1	A	6.4	A	9.1	A	8.6	N/A
10. Missouri Flat Rd /SR 49 (Pleasant Valley Rd)	Signal	B	18.7	B	19.3	B	15.7	B	15.5	N/A
11. Forni Rd / Golden Center Dr	EB /WB									No
NB Left	Stop	---	---	A	3.4	---	---	A	2.5	
SB Left		A	2.8	A	3.4	A	2.4	A	1.8	
WB		A	2.4	A	4.4	A	5.3	A	6.4	
EB		---	---	A	6.6	---	---	A	4.0	
12. Missouri Flat Road / Project Access	WB Stop	---	---			---	---			No
WB				C	17.1			C	21.7	

* meets peak hour warrant in AM and PM peak hours
(xx) – delay and level of service using HCM 7th Edition including TWLTL analysis
Red indicated threshold exceeded

TABLE 12
MID-AFTERNOON PEAK HOUR LEVELS OF SERVICE
EXISTING PLUS PROJECT CONDITIONS

Location	Control	Existing Mid-Afternoon Peak Hour		Existing + Project Mid-Afternoon Peak Hour		Traffic Signal Warranted?
		LOS	Average Delay	LOS	Average Delay	
5. Missouri Flat Rd / Road 2233	WB Stop					No
SB Left		---	---	B	14.4	
WB		---	---	C	24.2	
6. Missouri Flat Rd / Forni Rd	Signal	C	23.7	C	23.9	N/A
7. Missouri Flat Rd / Golden Center Dr	Signal	B	14.5	B	14.6	N/A
11. Forni Rd / Golden Center Dr	WB Stop					No
NB Left		---	---	A	7.6	
SB Left		A	8.5	A	8.5	
EB		---	---	B	10.4	
WB		C	15.3	C	22.2	

TABLE 13
EXISTING PLUS PROJECT PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Storage Length* (feet)	AM Peak Hour				PM Peak Hour			
		VPH			Ex Plus Project Queue (feet)	VPH			Ex Plus Project Queue (feet)
		Existing	Project Only	Total		Existing	Project Only	Total	
1. Missouri Flat Road / WB US 50 ramps									
NB left turn	170	433 (2)	14	447	168	419 (2)	21	440	165
NB through	360	506 (2)	4	510	384	581 (2)	5	586	370
SB through	520	415 (2)	4	419	190	765 (2)	5	770	285
WB left turn	410	501 (2)	16	517	214	500 (2)	21	521	204
WB right turn	410	261 (2)	0	261	97	311 (2)	0	311	123
2. Missouri Flat Road / EB US 50 ramps									
NB through	160	821 (2)	18	839	188	821 (2)	26	847	197
NB right turn	175	71	0	71	94	92	0	92	116
SB left	180	130 (2)	0	130	120	323 (2)	0	323	186
SB through	380	791 (2)	21	812	197	935 (2)	26	961	280
EB left+through+right turn	540	572 (3)	16	588	199	697 (3)	21	718	237
3. Missouri Flat Road / Mother Lode Drive									
NB left turn	180	37	4	41	66	40	5	45	63
SB through	140	1,117 (2)	37	1,154	180	1,292 (2)	47	1339	187
SB right turn	130	135	0	135	78	144	0	144	101

Highlighted values indicate queue length in excess of available storage + taper

* includes portion of taper without blocking adjacent lane

TABLE 13 (cont'd)
EXISTING PLUS PROJECT PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Storage Length* (feet)	AM Peak Hour VPH Existing	AM Peak Hour VPH Project Only	AM Peak Hour VPH Total	AM Peak Hour Ex Plus Project Queue (feet)	PM Peak Hour VPH Existing	PM Peak Hour VPH Project Only	PM Peak Hour VPH Total	PM Peak Hour Ex Plus Project Queue (feet)
5. Missouri Flat Road / Forni Road									
NB left turn	280	32	-1	31	59	57	0	57	131
NB right turn	210	70	10	80	101	30	11	41	134
SB left turn	325	217	19	236	323	115	22	137	182
SB right turn	205	209	1	210	133	315	2	317	202
EB left turn	290	202 (2)	7	209	162	449 (2)	8	457	211
WB left turn	205	56	42	98	162	24	63	87	103
6. Missouri Flat Road / Golden Center Drive									
NB left turn	120†	38	0	38	86	47	0	47	88
SB left turn	180	76	0	76	127	81	0	81	114
8. Missouri Flat Road / Industrial Drive									
NB left turn	100†	22	0	22	106	8	0	8	77
SB left turn	100†	15	0	15	50	14	0	14	53
9. Missouri Flat Road / Enterprise Drive									
NB left turn	100†	13	0	13	35	12	0	12	40
SB left turn	100†	5	0	5	23	10	0	10	30
10. Missouri Flat Road / SR 49 (Pleasant Valley Rd)									
SB left turn	600	230	8	238	190	539	12	551	240
SB right turn	600	228	9	237	117	241	14	255	82
EB left turn	180†	329 (2)	11	340	192	211 (2)	14	225	131
WB right turn	255	470	9	479	241	333	12	345	113

Highlighted values indicate queue length in excess of available storage + taper
* includes portion of taper without blocking adjacent lane
† length prior to becoming TWLTL

TABLE 14
MID-AFTERNOON PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS
EXISTING PLUS PROJECT CONDITIONS

Location	Storage Length* (feet)	Existing Mid-Afternoon Peak Hour		Existing + Project Mid-Afternoon Peak Hour	
		VPH	Queue (feet)	VPH	Queue (feet)
5. Missouri Flat Road / Forni Road					
NB left turn	280	54	135	54	138
NB right turn	210	29	<25	37	<25
SB left turn	325	120	120	138	133
SB right turn	205	319	133	319	138
EB left turn	290	394	130	401	140
WB left turn	205	26	<25	75	48
6. Missouri Flat Road / Golden Center Drive					
NB left turn	120†	60	30	60	33
SB left turn	180	82	43	82	43

Existing plus Project Roadway Segment Levels of Service. Table 15 summarizes the Levels of Service based on the Existing plus Project traffic volumes on study area roads with the modified roadway configurations. Applicable Level of Service thresholds and roadway classifications are presented. The multilane segment between Mother Lode Drive and Golden Center Drive and the two-lane segment between China Garden Road and Pleasant Valley Road will continue to operate above the County threshold, at LOS D or better. The segment between Golden Center Drive and China Garden Road will continue to operate at LOS F within the two-lane portion of this segment. This segment has v/c ratios of 1.08 in the a.m. peak hour and 1.20 in the p.m. peak hour; thus, the segment is not considered deficient.

TABLE 15
MISSOURI FLAT ROAD SEGMENT LEVELS OF SERVICE
EXISTING PLUS PROJECT CONDITIONS

Roadway	Location	Facility Classification	Standard		Exist Plus Project Mid-Week Condition	
			Hourly Volume Threshold	LOS	Roadway Hourly Volume	LOS
Missouri Flat Road	Mother Lode Dr to Golden Center Dr	Four-Lane Multi Lane Highway (4M)	4,970	E	2,428 (2,842)	C (C)
	Golden Center Dr to China Garden Rd	Two-Lane Highway (2A)	1,650	E	1,777 (1,975)	**F (F)**
	China Garden Rd to Pleasant Valley Rd	Two-Lane Highway (2A)	1,650	E	1,378 (1,488)	D (D)
AM (PM) **Bold** indicates LOS threshold exceeded and v/c threshold not exceeded						

CUMULATIVE ANALYSIS (2040)

The analysis of the long range 2040 cumulative condition is intended to consider whether deficiencies will occur with this project within the context of buildout of the General Plan circulation element occurring in 2040.

Year 2040 Forecasts / Conditions

Roadway Conditions

Roadways in 2040 are generally projected to remain with their current lane configurations. The following changes to the roadway network are identified in the El Dorado County Adopted 2022 Capital Improvement Program:

- Diamond Springs Parkway – This project is slated for construction in FY 23/24 through FY 24/25. This roadway will include two through lanes in each direction beginning along Missouri Flat Road east of Golden Center Drive to SR 49 south of Bradley Drive. Turn lanes will be provided at key intersections. Missouri Flat Road will become the west and south legs of the Missouri Flat Road / Diamond Springs Parkway intersection. Northbound Missouri Flat Road will consist of dual left turn lanes and a shared through-right lane.

- Missouri Flat Road south of Diamond Springs Parkway – This project will widen Missouri Flat Road to include two through lanes in each direction, sidewalk, curb and gutter and bike lanes Between China Garden Road and Pleasant Valley Road (SR 49); the segment between China Garden Road and Diamond Springs Parkway is part of the Diamond Springs Parkway project. This project is scheduled between FY 33/34 and FY 42/43.

- Missouri Flat Road / Enterprise Drive intersection – This project will install a traffic signal with scheduled completion by FY 23/24; this signal has been assumed completed under Existing and Existing plus Project conditions.

- Missouri Flat Road / Industrial Drive intersection – This project will install a traffic signal, construct turn lanes and provide for minor realignment of Industrial Drive. The signal is currently operational in a temporary arrangement with wood poles. The scheduled completion of the project is FY 23/24.

- Missouri Flat Road / China Garden Road – The *El Dorado County Public Safety Facility Project EIR (2016)* identified two alternative mitigations for this intersection. These included signalization of the intersection or alternatively, restricting the eastbound and westbound approaches to right-turns only. County staff determined that a signal at China Garden Road is not the preferred alternative based on the proximity of the traffic signal at Industrial Drive. Therefore, side street approaches to the Missouri Flat Road / China Garden Road intersection will be limited to right turns only.

- El Dorado Trail Missouri Flat Road Bike / Pedestrian Overcrossing - This project will construct a bicycle/pedestrian over-crossing as part of the El Dorado Trail at Missouri Flat Road with construction scheduled for FY 23/24.

Traffic signal timing was optimized at all intersections under the assumption that signal operations do not remain static between Existing and Cumulative conditions.

2040 Traffic Forecasts

Year 2040 traffic forecasts were based on the most recent Countywide traffic model. Two methods were used to develop forecasts of future year peak hour intersection turning movement traffic volumes for this traffic impact study:

> **Method #1** was used at existing intersections that would not have legs added to the intersection in the future and would not experience substantial unbalanced increases in traffic volumes (substantial increases in traffic volumes on some legs of the intersection, but not on other legs of the intersection). At these intersections, existing turning movement count data are available, and can be increased by application of model-generated growth factors. The intersection of Missouri Flat and Forni Road is an example of an intersection in this category.
>
> **Method #2** was used at new intersections, intersections that would have added legs in the future, or would experience substantial unbalanced increases in traffic volumes. At these intersections, existing turning movement count data are not available, or cannot be validly increased by application of model-generated growth

factors. The intersection of Diamond Springs Parkway and Missouri Flat Road is an example of an intersection in this category.

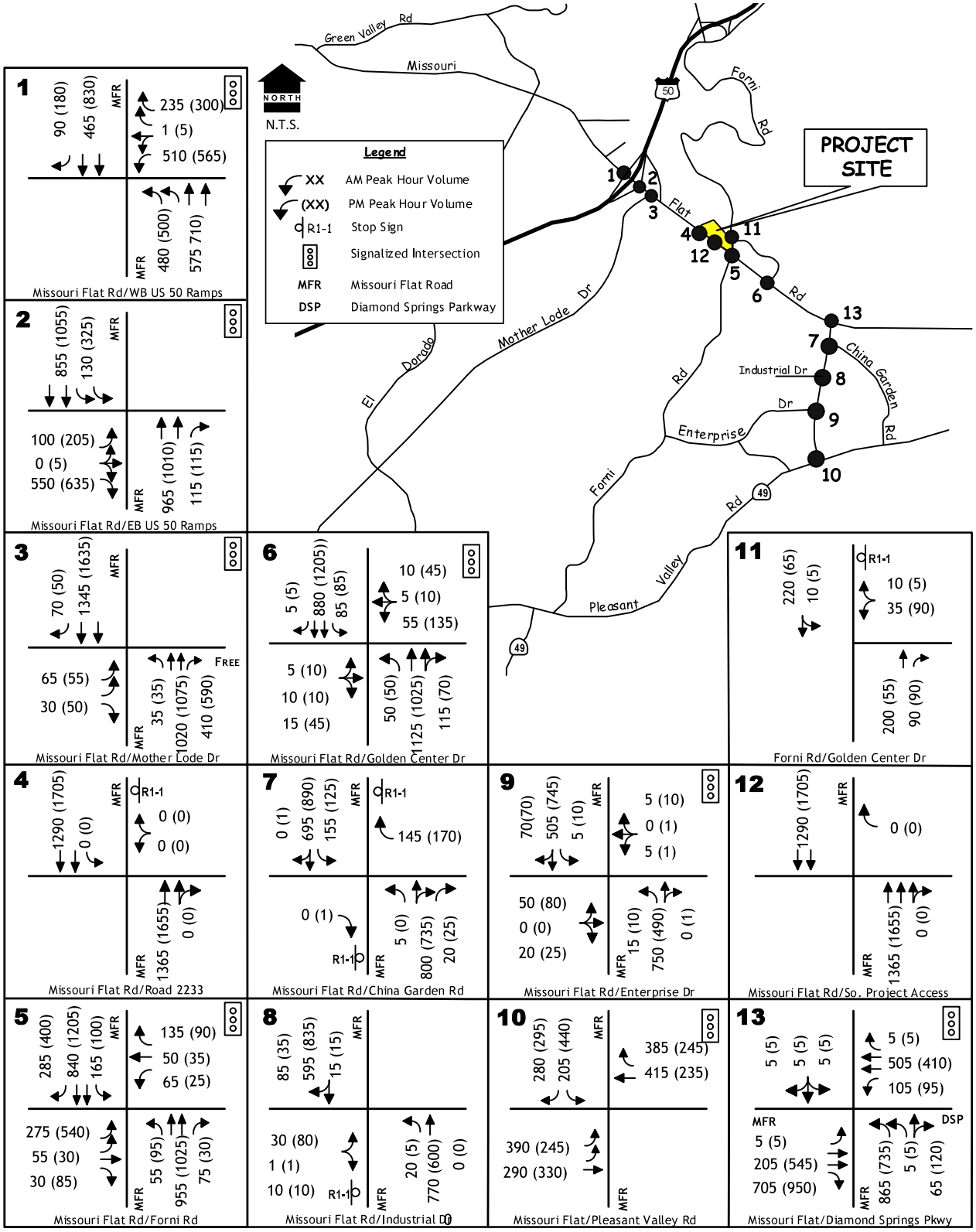
Method #1. In Method #1, peak hour traffic volumes from the travel model were used to generate growth factors. These growth factors were applied to existing peak hour intersection turning movement traffic volumes. The development of future year intersection turning movement traffic volumes requires that the turning movements at each intersection "balance". To achieve the balance, inbound traffic volumes must equal the outbound traffic volumes, and the volumes must be distributed among the various left-turn, through, and right-turn movements at each intersection. The "balancing" of future year intersection turning movement traffic volumes was conducted using methods described in the Transportation Research Board's (TRB's) National Cooperative Highway Research Program (NCHRP) Report 255, *Highway Traffic Data for Urbanized Area Project Planning and Design*. The NCHRP 255 method applies the desired peak hour directional volumes to the intersection turning movement volumes, using an iterative process to balance and adjust the resulting forecasts to match the desired peak hour directional volumes.

Method #2. In Method #2, where the road configuration is expected to change between the current year and 2040 the model forecasts were used to determine approach and departure volumes at the new intersections. As noted in the County's TIS Guidelines the forecasted model volumes were reviewed for reasonableness and adjusted as necessary. Balancing of the future turning movement traffic volumes were again conducted using the methods from NCHRP 255.

2040 Intersection Levels of Service. The identified Year 2040 volumes were used to recalculate operating Levels of Service at the study intersections. Figures 8A and 8B present the projected 2040 traffic volumes. Table 16 displays the a.m. and p.m. peak hour Levels of Service while Table 17 displays midday peak hour Levels of Service at each study intersection in the 2040 condition. All intersections will operate at acceptable levels of service during the a.m., p.m. and midday peak periods.

Traffic Signal Warrants. 2040 traffic volumes at unsignalized intersections were compared to peak hour warrant requirements to determine whether traffic signals may be needed. The Missouri Flat Road / China Garden Road intersection will meet the peak hour warrant in the a.m. and p.m. peak hour, although the intersection will operate within acceptable County thresholds. No other intersections will meet the peak hour warrant.

2040 Intersection Queues. Tables 18 and 19 identify peak period queues for the Year 2040 base condition. As previously noted through movement queues at the US 50 interchange have been identified due to the short spacing between the westbound ramp intersection to Mother Lode Drive. Five locations are projected to exceed the available storage.



2040 TRAFFIC VOLUMES AND LANE CONFIGURATIONS

2040 TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 8B

FLECKER ASSOCIATES

7500-01 7/25/2023

TABLE 16
PEAK HOUR INTERSECTION LEVELS OF SERVICE
2040 PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour				PM Peak Hour				Traffic Signal Warranted?
		2040		2040 Plus Project		2040		2040 Plus Project		
		LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	
1. Missouri Flat Rd / WB US 50 ramps	Signal	C	27.0	C	27.5	C	27.6	C	28.2	N/A
2. Missouri Flat Rd / EB US 50 ramps	Signal	B	12.7	B	13.8	C	21.7	C	23.5	N/A
3. Missouri Flat Rd / Mother Lode Dr	Signal	A	7.5	A	7.9	A	9.4	B	10.3	N/A
4. Missouri Flat Rd / Road 2233	WB Stop									No
SB Left		---	---	(B)	(14.5)	---	---	(C)	(19.6)	
WB		---	---	(D)	(27.7)	---	---	(E)	(44.8)	
5. Missouri Flat Rd / Forni Rd	Signal	C	28.5	C	28.6	C	31.7	C	33.4	N/A
6. Missouri Flat Rd / Golden Center Dr	Signal	B	12.4	B	12.2	B	13.4	B	14.8	N/A
7. Missouri Flat Rd / China Garden Rd	WB Stop									Yes*
NB Left		A	7.3	A	6.8	---	---	---	---	
SB Left		A	9.3	B	10.0	A	6.2	A	7.0	
EB Right		---	---	---	---	B	10.5	A	5.1	
WB Right		A	5.5	A	5.4	A	6.2	A	5.5	
8. Missouri Flat Rd/ Industrial Dr	Signal	A	7.7	A	7.3	A	5.6	A	6.0	N/A

* meets peak hour warrant in AM and PM peak hour
(xx) – delay and level of service using HCM 7th Edition including TWLTL analysis

TABLE 16 (cont'd)
PEAK HOUR INTERSECTION LEVELS OF SERVICE
2040 PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour				PM Peak Hour				Traffic Signal Warranted?
		2040		2040 Plus Project		2040		2040 Plus Project		
		LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	
9. Missouri Flat Rd / Enterprise Dr	Signal	A	6.0	A	5.5	A	7.0	A	7.5	N/A
10. Missouri Flat Rd / Pleasant Valley Rd (SR 49)	Signal	B	17.8	B	18.4	B	14.9	B	15.1	N/A
11. Forni Rd / Golden Center Dr	EB / WB									No
NB Left	Stop	---	---	A	3.4	---	---	A	2.7	
SB Left		A	2.8	A	3.7	A	2.5	A	2.5	
WB		A	1.9	A	2.1	A	3.5	A	4.1	
EB		---	---	A	5.5	---	---	A	4.2	
12. Missouri Flat Rd / Project Access	WB Stop									N/A
WB		---	---	A	7.2	---	---	A	8.2	
13. Missouri Flat Road / Diamond Springs Pkwy	Signal	B	17.1	B	17.6	C	20.2	C	20.5	N/A

TABLE 17
MID-AFTERNOON PEAK HOUR LEVELS OF SERVICE
2040 CONDITIONS

Location	Control	2040 Mid-Afternoon Peak Hour		2040 Mid-Afternoon Peak Hour		Traffic Signal Warranted?
		LOS	Average Delay	LOS	Average Delay	
4. Missouri Flat Rd / Road 2233	WB Stop					No
SB Left		B	14.3	C	16.4	
WB		D	25.2	D	32.2	
5. Missouri Flat Rd / Forni Rd	Signal	C	23.6	C	24.2	N/A
6. Missouri Flat Rd / Golden Center Dr	Signal	B	15.7	B	15.9	N/A
11. Forni Rd / Golden Center Dr	EB / WB Stop					No
NB Left		---	---	A	7.6	
SB Left		A	8.4	A	8.4	
WB		B	14.4	C	20.6	
EB		---	---	B	10.4	

TABLE 18
2040 PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Storage Length* (feet)	AM Peak Hour		PM Peak Hour	
		VPH	Queue (feet)	VPH	Queue (feet)
1. Missouri Flat Road / WB US 50 ramps					
NB left turn	170	480 (2)	162	500 (2)	159
NB through	360	575 (2)	286	710 (2)	487
SB through	520	465 (2)	167	830 (2)	270
WB left turn	410	510 (2)	208	565 (2)	214
WB right turn	410	235 (2)	99	300 (2)	144
2. Missouri Flat Road / EB US 50 ramps					
NB through	160	965 (2)	197	1010 (2)	194
NB right turn	175	115	92	115	89
SB left	180	130 (2)	99	325 (2)	167
SB through	380	855 (2)	198	1,055 (2)	292
EB left+through+right turn	540	650 (3)	183	845 (3)	264
3. Missouri Flat Road / Mother Lode Drive					
NB left turn	180	35	72	35	68
SB through	140	1345 (2)	171	1635 (2)	191
SB right turn	130	70	51	50	65
5. Missouri Flat Road / Forni Road					
NB left turn	280	55	148	95	172
NB right turn	210	75	162	30	82
SB left turn	325	165	219	100	214
SB right turn	205	285	214	400	232
EB left turn	290	275 (2)	184	540 (2)	253
WB left turn	205	65	113	25	55
6. Missouri Flat Road / Golden Center Drive					
NB left turn	120†	50	95	50	108
SB left turn	180	85	126	85	131

Highlighted values indicate queue length in excess of available storage + taper
* includes portion of taper without blocking adjacent lane
† length prior to becoming TWLTL

TABLE 18 (cont'd)
2040 PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Storage Length* (feet)	AM Peak Hour		PM Peak Hour	
		VPH	Queue (feet)	VPH	Queue (feet)
8. Missouri Flat Road / Industrial Drive					
NB left turn	200	20	54	5	24
SB left turn	200	15	43	15	34
9. Missouri Flat Road / Enterprise Drive					
NB left turn	200	15	41	10	32
SB left turn	200	5	25	10	34
10. Missouri Flat Road / SR 49 (Pleasant Valley Rd)					
SB left turn	600	205	156	440	228
SB right turn	600	280	131	295	92
EB left turn	180†	390 (2)	175	245 (2)	154
WB right turn	255	385	209	245	106
13. Missouri Flat Road / Diamond Springs Parkway					
NB left	275	865 (2)	193	735 (2)	164
EB right	250	705	240	950	314
WB left	500	105	113	95	105

Highlighted values indicate queue length in excess of available storage + taper
* includes portion of taper without blocking adjacent lane
† length prior to becoming TWLTL

TABLE 19
MID-AFTERNOON PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS
2040 CONDITIONS

Location	Storage Length* (feet)	2040 Mid-Afternoon Peak Hour	
		VPH	Queue (feet)
5. Missouri Flat Road / Forni Road			
NB left turn	280	70	125
NB right turn	210	30	<25
SB left turn	325	115	130
SB right turn	205	370	160
EB left turn	290	450	190
WB left turn	205	30	<25
6. Missouri Flat Road / Golden Center Drive			
NB left turn	120	60	38
SB left turn	180	85	50

2040 Roadway Segment Levels of Service. Table 20 summarizes the Levels of Service based on the projected 2040 traffic volumes on study area roads with the future roadway configuration. Missouri Flat Road will be a four-lane roadway (4M) between the US 50 ramps and Pleasant Valley Road. Applicable Level of Service thresholds and roadway classifications are presented. All segments will operate at LOS D or better.

TABLE 20
MISSOURI FLAT ROAD SEGMENT LEVELS OF SERVICE
2040 CONDITIONS

Roadway	Location	Facility Classification	Standard		2040 Mid-Week Condition	
			Hourly Volume Threshold	LOS	Roadway Hourly Volume	LOS
Missouri Flat Road	Mother Lode Dr to Golden Center Dr	Four-Lane Multi Lane Highway (4M)	4,970	E	2,658 (3,366)	C (D)
	Golden Center Dr to China Garden Rd	Four-Lane Multi Lane Highway (4M)	4,970	E	2,107 (2,376)	B (C)
	China Garden Rd to Pleasant Valley Rd	Four-Lane Multi Lane Highway (4M)	4,970	E	1,385 (1,402)	B (B)
AM (PM)						

2040 Plus Project

Trip Distribution & Assignment. A new trip distribution pattern was applied to trips related to the Project in the future. The Long-Term scenario considers the completion of the Diamond Springs Parkway (DSP), between Missouri Flat Road and Diamond Road. Table 10 presents the project trip distributions for 2040 conditions. Project traffic that is projected to use Missouri Flat Road and Pleasant Valley Road to get to the project site in the short term will be able to use DSP by 2040 to access the site directly. Figure 9 presents the modified trip distribution with DSP completed.

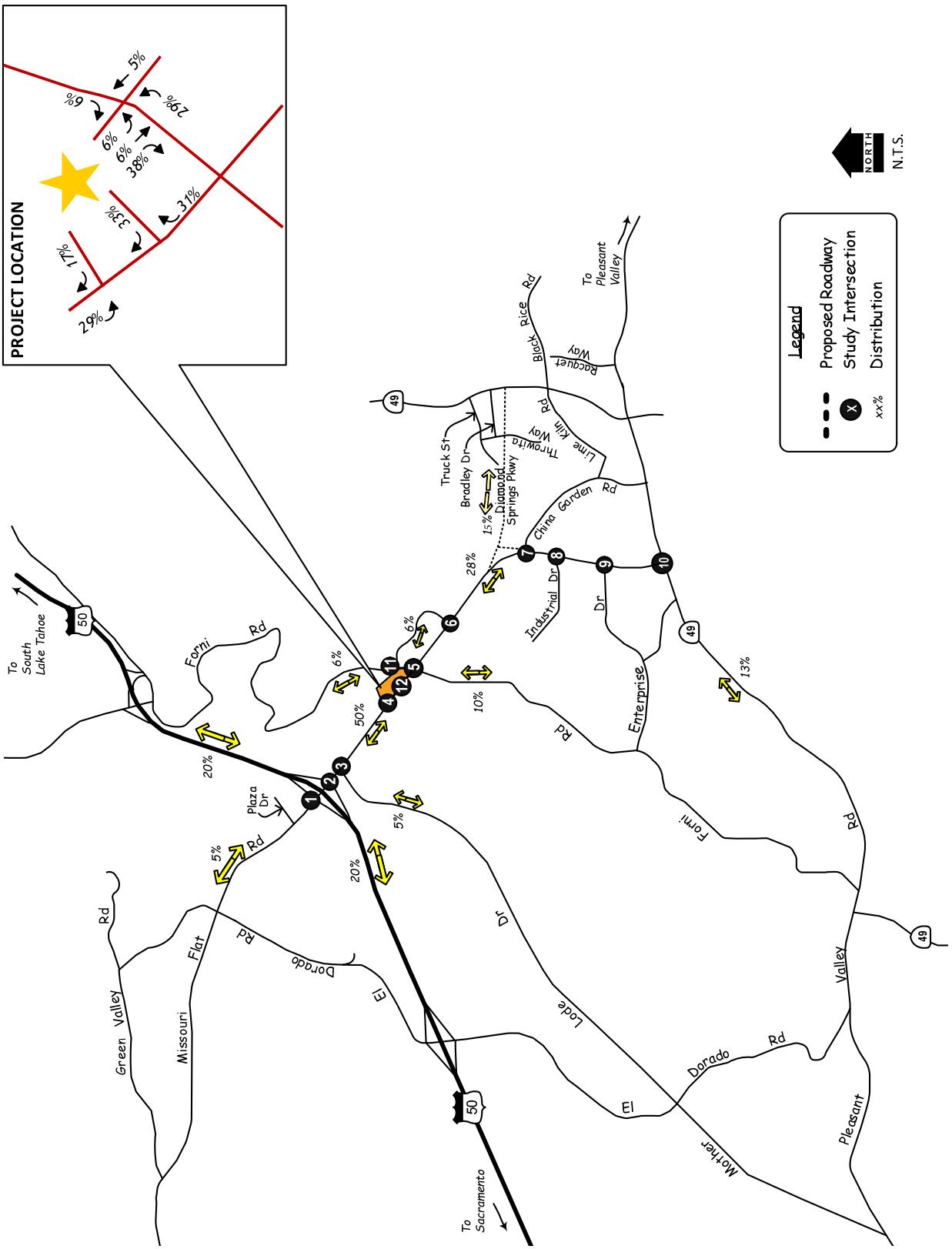
Intersection Levels of Service. The Year 2040 plus Project volumes were used to recalculate operating Levels of Service at the study intersections. Figures 10A and 10B display the "2040 Project Only" traffic volumes while Figures 11A and 11B present the "2040 Plus Project traffic" traffic volumes at each study intersection in the a.m., p.m. and midday peak hours. Tables 16 and 17 display the a.m. and p.m. peak hour Levels of Service at each study intersection. All intersections are projected to operate at acceptable levels of service.

Traffic Signal Warrants. 2040 Plus Project traffic volumes at unsignalized intersections were compared to peak hour warrant requirements to determine whether traffic signals may be needed. The Missouri Flat Road / China Garden Road intersection will continue to meet the peak hour warrant in the a.m. and p.m. peak hour and will continue to operate at LOS B or better conditions.

Intersection Queues. Tables 21 and 22 identify peak period queues for the Year 2040 plus Project condition assuming the addition of project trips**.** Project trips will result in additional queuing throughout the study area with five locations projected to exceed the available storage. As previously noted through movement queues at the US 50 interchange have been identified due to the short spacing between the westbound ramp intersection to Mother Lode Drive.

2040 plus Project Roadway Segment Levels of Service. Table 23 summarizes the Levels of Service based on the projected 2040 traffic volumes on study area roads with the future roadway configuration. Missouri Flat Road will be a four-lane roadway (4M) between the US 50 ramps and Pleasant Valley Road. Applicable Level of Service thresholds and roadway classifications are presented. All segments will operate at LOS D or better.

PD-R21-0002/CUP21-0004/P-E25-0001 CREEKSIDE PLAZA ARCO
EXHIBIT S - TRAFFIC IMPACT ANALYSIS



2040 PROJECT TRIP DISTRIBUTION

FIGURE 9

Creekside Plaza Traffic Impact Analysis

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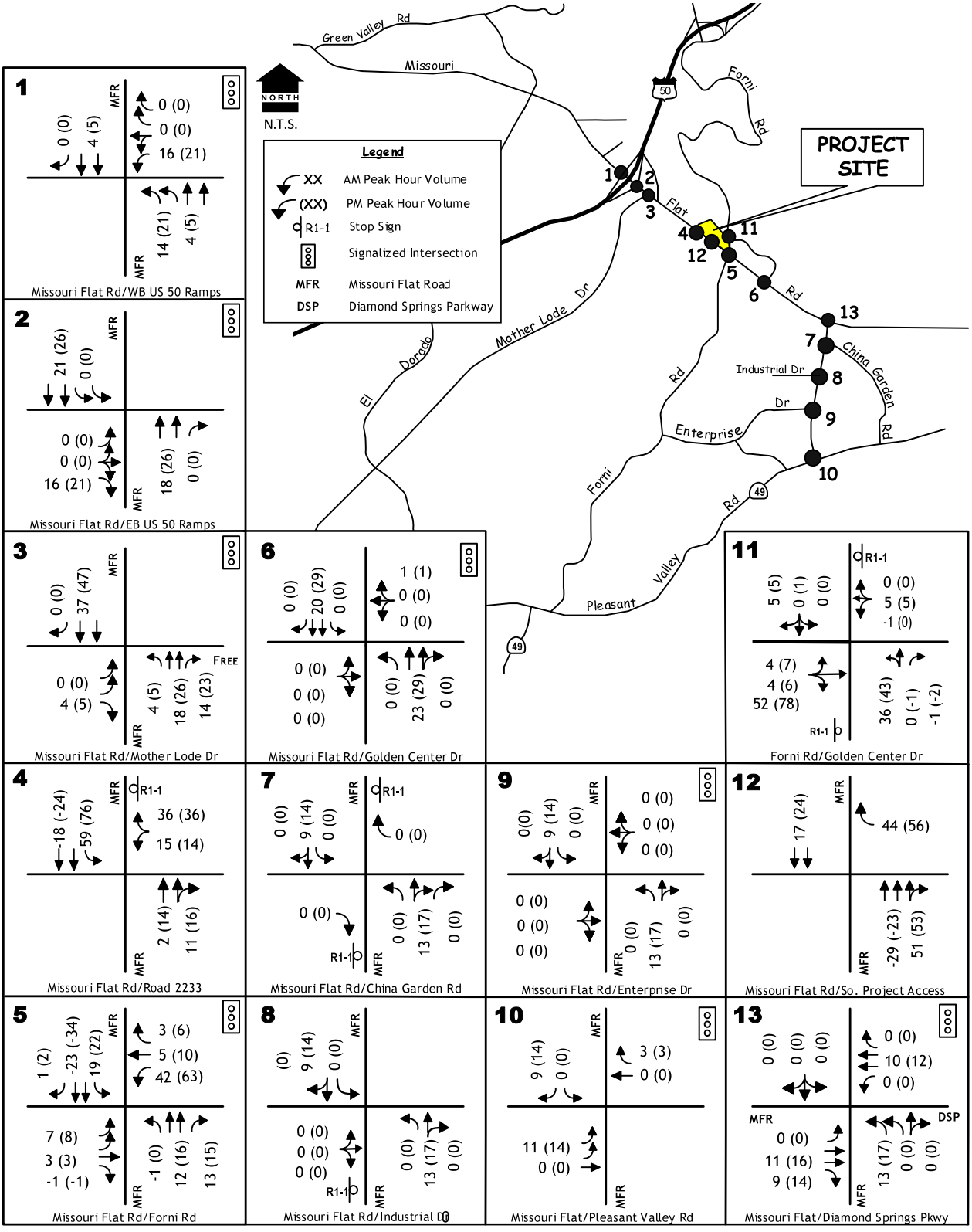

2040 PROJECT VOLUMES AND LANE CONFIGURATIONS

PROJECT TRAFFIC
MID-DAY

2040 PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 10B

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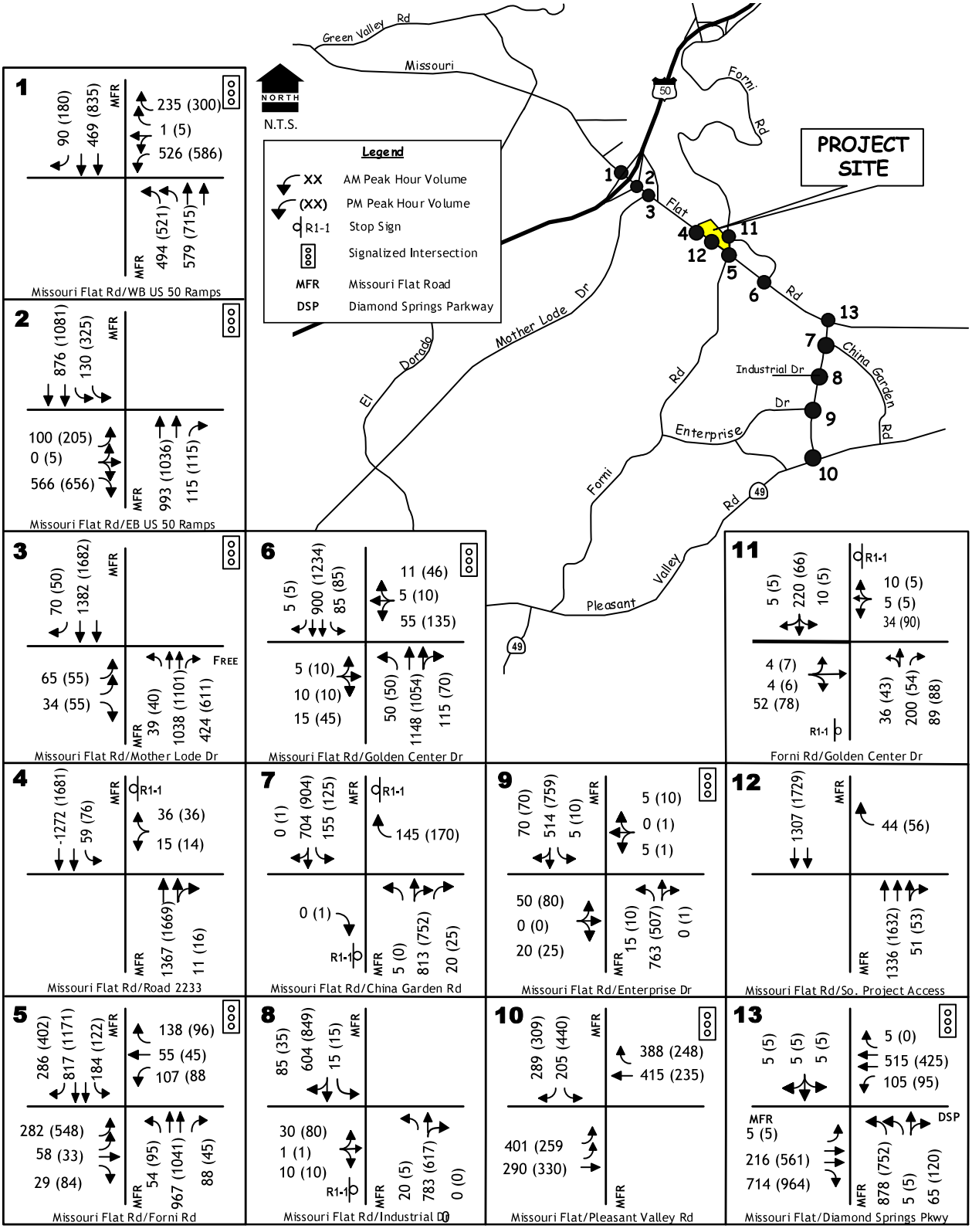
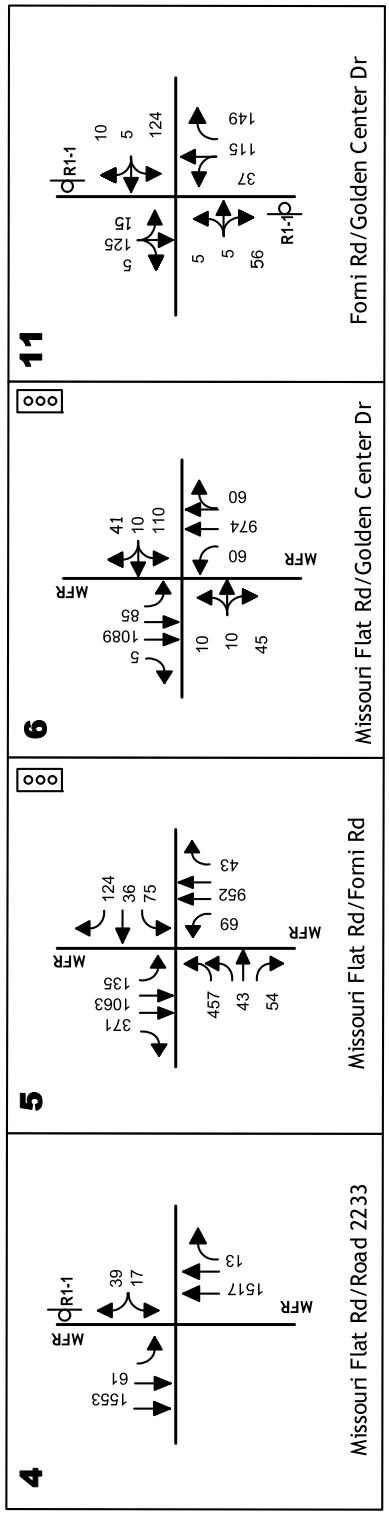


2040 PLUS PROJECT PROJECT VOLUMES AND LANE CONFIGURATIONS



2040 PLUS PROJECT TRAFFIC MID-DAY

2040 PLUS PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

FIGURE 11B

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TABLE 21
2040 PLUS PROJECT PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Storage Length* (feet)	AM Peak Hour VPH 2040	AM Peak Hour VPH Project Only	AM Peak Hour VPH Total	AM Peak Hour 2040 Plus Project Queue (feet)	PM Peak Hour VPH 2040	PM Peak Hour VPH Project Only	PM Peak Hour VPH Total	PM Peak Hour 2040 Plus Project Queue (feet)
1. Missouri Flat Rd / WB US 50 ramps									
NB left turn	170	480 (2)	14	494	164	500 (2)	21	521	154
NB through	360	575 (2)	4	579	470	710 (2)	5	715	481
SB through	520	465 (2)	4	469	167	830 (2)	5	835	266
WB left turn	410	510 (2)	16	526	207	565 (2)	21	586	216
WB right turn	410	235 (2)	0	235	94	300 (2)	0	300	149
2. Missouri Flat Rd / EB US 50 ramps									
NB through	160	965 (2)	18	983	201	1010 (2)	26	1,036	193
NB right turn	175	115	0	115	94	115	0	115	82
SB left	180	130 (2)	0	130	101	325 (2)	0	325	170
SB through	380	855 (2)	21	876	206	1,055 (2)	26	1,081	308
EB left+through+right turn	540	650 (3)	16	566	193	845 (3)	21	866	292
3. Missouri Flat Rd / Mother Lode Drive									
NB left turn	180	35	4	39	69	35	5	40	113
SB through	140	1,345 (2)	37	1,382	180	1,635 (2)	47	1,682	197
SB right turn	130	70	0	70	69	50	0	50	52
5. Missouri Flat Rd / Forni Rd									
NB left turn	280	55	-1	54	148	95	0	95	190
NB right turn	210	75	13	88	183	30	15	45	119
SB left turn	325	165	19	184	232	100	22	122	208
SB right turn	205	285	1	286	213	400	2	402	230
EB left turn	290	275 (2)	7	282	168	540 (2)	8	548	249
WB left turn	205	65	42	107	139	25	63	88	122

Highlighted values indicate queue length in excess of available storage + taper

* includes portion of taper without blocking adjacent lane

TABLE 21 (cont'd)
2040 PLUS PROJECT PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS

Location	Storage Length* (feet)	AM Peak Hour VPH 2040	AM Peak Hour VPH Project Only	AM Peak Hour VPH Total	AM 2040 Plus Project Queue (feet)	PM Peak Hour VPH 2040	PM Peak Hour VPH Project Only	PM Peak Hour VPH Total	PM 2040 Plus Project Queue (feet)
6. Missouri Flat Rd / Golden Center Drive									
NB left turn	120†	50	0	50	95	50	0	50	114
SB left turn	180	85	0	85	119	85	0	85	137
8. Missouri Flat Road / Industrial Drive									
NB left turn	200	20	0	20	57	5	0	5	25
SB left turn	200	15	0	15	46	15	0	15	31
9. Missouri Flat Road / Enterprise Drive									
NB left turn	200	15	0	15	38	10	0	10	30
SB left turn	200	5	0	5	<25	10	0	10	36
10. Missouri Flat Rd / SR 49 (Pleasant Valley Rd)									
SB left turn	600	205	0	205	127	440	0	440	225
SB right turn	600	280	9	289	133	295	14	309	109
EB left turn	180†	390 (2)	11	401	177	245 (2)	14	259	158
WB right turn	250	385	3	388	227	245	3	248	101
13. Missouri Flat Rd / Diamond Springs Pkwy									
NB left	275	865 (2)	13	878	218	735 (2)	17	752	170
EB right	250	705	9	714	251	950	14	964	328
WB left	500	105	0	105	112	95	0	95	103

Highlighted values indicate queue length in excess of available storage + taper
* includes portion of taper without blocking adjacent lane
† length prior to becoming TWLTL

TABLE 22
MID-AFTERNOON PEAK HOUR QUEUES AT SIGNALIZED INTERSECTIONS
2040 PLUS PROJECT CONDITIONS

Location	Storage Length* (feet)	2040 Mid-Afternoon Peak Hour		2040 plus Project Mid-Afternoon Peak Hour	
		VPH	Queue (feet)	VPH	Queue (feet)
5. Missouri Flat Road / Forni Road					
NB left turn	280	70	125	69	128
NB right turn	210	30	<25	43	<25
SB left turn	325	115	130	135	143
SB right turn	205	370	160	371	160
EB left turn	290	450	190	457	193
WB left turn	205	30	<25	75	53
6. Missouri Flat Road / Golden Center Drive					
NB left turn	120	60	38	60	40
SB left turn	180	85	50	85	53

TABLE 23
MISSOURI FLAT ROAD SEGMENT LEVELS OF SERVICE
2040 PLUS PROJECT CONDITIONS

Roadway	Location	Facility Classification	Standard		2040 plus Project Mid-Week Condition	
			Hourly Volume Threshold	LOS	Roadway Hourly Volume	LOS
Missouri Flat Road	Mother Lode Dr to Golden Center Dr	Four-Lane Multi Lane Highway (4M)	4,970	E	2,747 (3,487)	C (D)
	Golden Center Dr to China Garden Rd	Four-Lane Multi Lane Highway (4M)	4,970	E	2,150 (2,434)	B (C)
	China Garden Rd to Pleasant Valley Rd	Four-Lane Multi Lane Highway (4M)	4,970	E	1,407 (1,433)	B (B)
AM (PM)						

ON-SITE TRANSPORTATION REVIEW

An on-site review of the facilities was conducted based on the County's TIS Guidelines.

Accident Review of Local Roadways. Crash data was obtained from the CHP I-SWITRS website (https://iswitrs.chp.ca.gov/Reports/jsp/ for the previous five-year period, 2018 through 2022. At the Missouri Flat Road / Forni Road intersection 12 crashes were identified at the intersection in the five-year period. The primary collision factor (PCF) of four crashes at the Missouri Flat Road / Forni Road intersection failure to obey traffic signals; each crash resulted in a broadside collision. Two crashes along Missouri Flat Road in the intersection area included speed related rear-end collisions while two other crashes involved motorists making an improper turn. The remaining four crashes included unsafe starting, a DUI, an unsafe lane change and a pedestrian . auto crash.

Crash history was also reviewed at the Forni Road / Golden Center Drive intersection. In the five-year period two crashes were recorded. The PCF's included failure to yield the right of way resulting in a broadside collision and a speed related rear-end crash.

Site Circulation / Driveway Locations. The project consists of a gas station / C-store on the north side of the site with a conveyor-system tunnel car wash along the east side of the C-store and fueling positions. Vacuum stations for the car wash are located at the tunnel exit in the central area of the site, near the right-in, right-out driveway. The south side of the site includes the fast-food restaurant with drive-through lane and the strip retail uses. The retail building will be located along the Forni Road frontage between Missouri Flat Road and Golden Center Drive while the fast-food restaurant and a small 'end cap' retail alongside the restaurant will be located further north.

The site will have three access driveways, one along Road 2233 allowing full access at Missouri Flat Road, a right-in, right-out driveway along Missouri Flat Road and a full access driveway at the existing Forni Road / Golden Center Drive intersection. The site is linear with a single drive/parking aisle provided in the center portion of the site. Because of the linear layout it is expected that primary access will be dependent on the use.
.
The site's northern driveway provides access onto Missouri Flat Road via Road 2233. This road is a low volume road providing access for about five existing residences. Full access is provided at the Missouri Flat Road intersection, and it is expected that southbound gas station/C-store and car wash traffic will enter via this driveway. Retail and fast-food customers may elect to enter via the other driveways. It is expected that customers exiting from these uses to the south may exit using the Road 2233 intersection or may travel through the site and exit via Forni Road.

Traffic arriving from the south or from Forni Road is expected to use either the right-in, right-out driveway or from the Forni Road driveway. Exiting traffic to the north is expected to use the right-in, right-out Missouri Flat Road driveway while southbound or westbound traffic will exit onto Forni Road and through the Missouri Flat Road intersection.

The project is designed to provide the minimum 25' throat depth at each of the driveways. The worst on-site queues are projected to occur during the 2040 p.m. peak hour. At each of the three locations the outbound queues are projected to be 58' or less. The longest queue of 58' is projected to occur during the 2040 plus Project scenario for outbound right turns at the Missouri Flat Road right-in, right-out driveway and at the Forni Road driveway. As Road 2233 is a low volume road it is expected that customers exiting the north driveway will be able to queue directly at Missouri Flat Road. Adequate queuing is available at all driveways, although the outbound queues could create short delays for customers transiting the site.

Sight Distance. A sight distance analysis was completed at the proposed project driveways at the Forni Road / Golden Center Drive intersection and at the proposed right-in, right-out driveway on Missouri Flat Road.

Available sight distance was evaluated using the standards documented in the Caltrans *Highway Design Manual* (HDM). Based on the location of the driveways "**Minimum Stopping Sight** Distance" (MSSD) and "**Corner Sight Distance**" (CSD) was considered. These criteria are documented in Tables 201.1 and 405.1A of the HDM. As noted in the HDM corner sight distance are not applied to urban driveways unless signalized. However, based on the roadway conditions corner sight distance criteria was also reviewed.

The Minimum Stopping Sight Distance (MSSD) is the distance required for an approaching motorist to identify a hazard and come to a stop. HDM Table 201.1 notes that the minimum sight distance requirement for the posted speed limit of 45 mph is 360 feet. The available sight distance at the driveway was investigated from a location 15 feet from the edge of travel way to determine whether this standard can be met. The line of sight at the driveway is clear as Missouri Flat Road is straight and level. Looking south from the driveway the 360-foot minimum standard is exceeded and drivers will be able to see approaching traffic beyond this minimum required distance.

Corner Sight Distance (CSD) is the distance needed for an exiting motorist to see approaching vehicles and complete a turning maneuver before that vehicle arrives. Table 405.1 A notes that CSD is determined based on the design speed of the major road and the time gap needed to complete the maneuver. For a fuel truck departing the site and turning north, the required time gap is 10½ seconds. With a 45-mph posted speed limit a CSD of about 695 feet is required ($1.47V_mT_{g)}$ to provide adequate time for combination trucks to enter northbound Missouri Flat Road before a northbound vehicle arrives. Based on the projected future lane adequate sight distance appears available. It is recommended that any landscaping over 2 feet in height and all signage should be placed outside of the line of sight.

Missouri Flat Road Right-In/Right-Out Driveway. The posted speed limit along Missouri Flat Road is 45 miles per hour (mph). The corresponding minimum sight distance standard for this speed is 360 feet. Missouri Flat Road is generally a four-lane roadway. Northbound departing the Forni Road intersection Missouri Flat Road will have three northbound lanes extending to Road 2233. This third lane will be a deceleration and acceleration lane for project traffic. The lane will end with a mandatory right turn at Road 2233.

Forni Road Driveway. This driveway will become the fourth leg of the Forni Road / Golden Center Drive intersection. Forni Road, between Missouri Flat Road and Placerville Drive is curvilinear with the road having larger radius curves closest to the project site. A posted speed limit along Forni Road was not observed along this roadway segment. Therefore, it appears that the roadway has a prima facie speed of 25 mph. The MSSD for a 25-mph roadway is 150 feet while 275 feet ($1.47V_mT_{g)}$ is required for CSD. Based on the projected future driveway location there appears to be over 400 feet of sight distance available. It is recommended that any landscaping on the north side of the driveway be placed outside of the line of sight.

On-Site Review. An on-site review of sight distance was also completed to determine whether any visibility issues may be present. Based on the proposed plan the drive aisles appear to provide adequate sight distance for site uses. It is recommended that low lying landscaping be planted at the north driveway at Road 2233 as the outbound direction of travel requires an almost 180º left turn to Missouri Flat Road. Outbound motorists may 'cut the corner' and the inclusion of centerline striping and a clear line of sight to the intersection is recommended. Pedestrian access within the site is generally along the perimeter of the site due to its linear layout. Pedestrians can walk in front of the retail building Missouri Flat Road and Forni Road. There are no sidewalk facilities along the east side of the site as there are no pedestrian attractors.

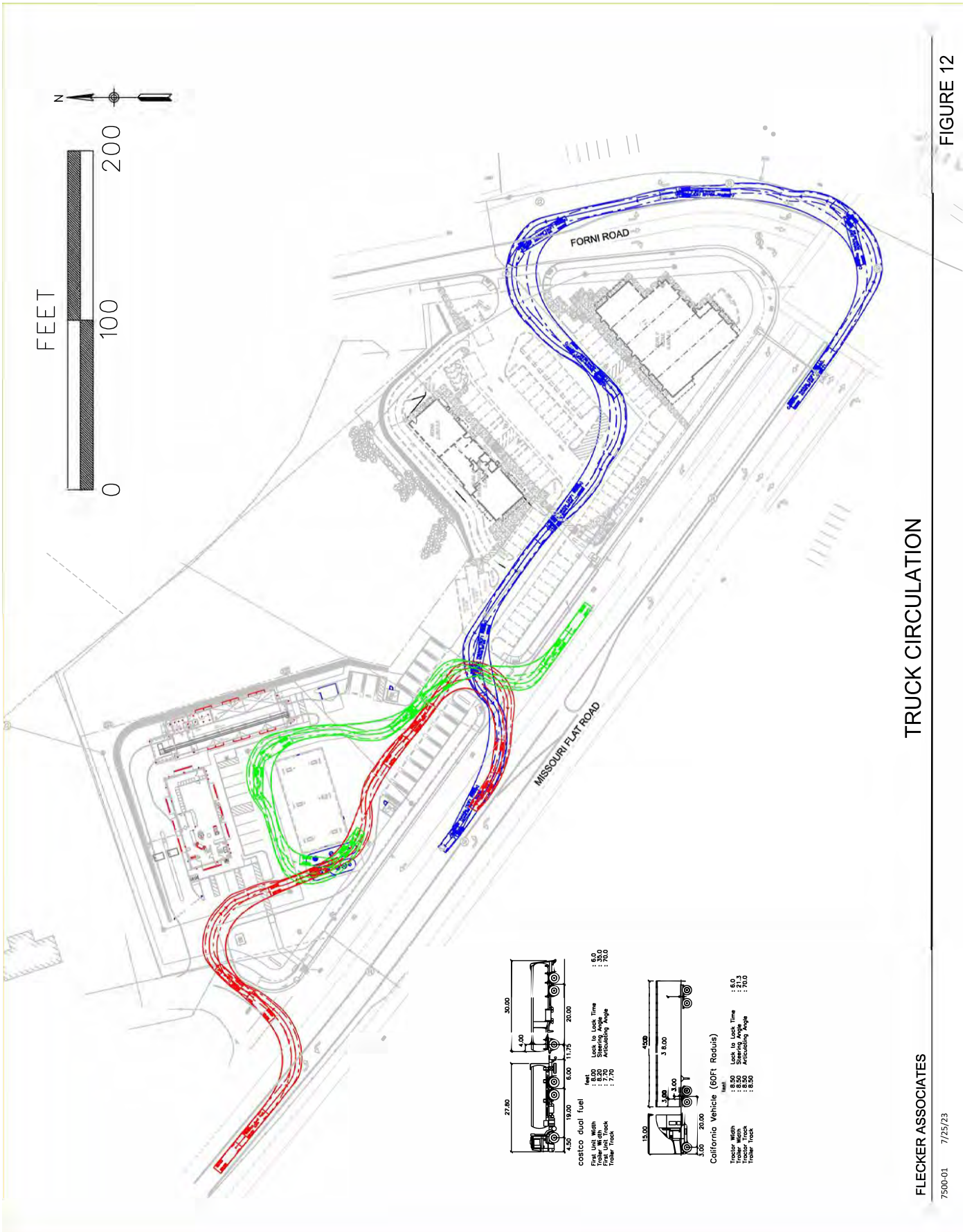
Parking Requirements. Parking requirements were reviewed to determine needed parking due to the zoning code and requirements relative to projected parking demand. Parking requirements relate to vehicles parked for extended periods of time for employees and customers within the retail uses as well as short-term parking for gas station / C-store, fast-food restaurant and car wash sites. Table 130.35.030.1 of the County's zoning code identifies off-street parking requirements for various uses. Table 24 displays the parking space requirements for each use type and the projected parking needs for the project. The County parking code does not identify requirements for tunnel car washes; therefore, the rate of 2 spaces per washing stall was used with the tunnel being considered a single stall. Based on the zoning code 53 stalls are required. The project proposes to provide 72 spaces, excluding 14 vacuum stations for the car wash, resulting in a net surplus of 19 spaces.

TABLE 24
PARKING REQUIREMENTS PER ZONING CODE

Use Type	Parking Space Requirement	Size	Parking Required
Fast Food Restaurant	1 per 250 sf. of Gross Floor Area (GFA) 1 RV space for every 20 parking spaces.	2,200 sf	9
Retail, General Indoor	1 per 300 sf. of AUA + 1 per 600 sf. of storage area.	7,950 sf (max) 0	27 0
Gas Station AND Food & Beverage	3 per service bay + 1 / 400 sf AUA or 1 per 200 sf + 1 / check stand + 1 / 600 sf storage	0 ‡ 2,380 sf (sales) 500 sf (storage, est)	0 14 1
Car Wash	2 per washing stall; Conveyor-system stalls may utilize stacking areas with a length of 24 feet (ft.) as parking spaces.	1 tunnel ◊	2
		Total Stalls Required	**53**
		Total Stalls Provided	**72**
		Net Surplus (Deficit)	**19***

AUA – active use area
GFA – gross floor area
‡ - ED County does not define parking requirement per fueling position; 0 service bays present and 0 sf of AUA
◊ automated tunnels not identified in zoning code; provided 2 stalls for employees
* excludes 14 vacuum stations for car wash

Truck Circulation. Two design vehicles were reviewed regarding access to and within the site. These included a dual tanker fuel truck for the gas station and a California Legal truck (CA-Legal) for the C-store and fast-food site. An *AutoTurn* assessment was completed for both vehicles and are shown in Figure 12. The fuel truck can enter the site from either driveway along Missouri Flat Road and exit towards US 50. The CA-Legal truck can enter the site from the Forni Road driveway and also exit towards US 50. Ideally, both truck types should be limited to off-hours as some drive aisles could be blocked while trucks are loading / unloading.



TRUCK CIRCULATION

FIGURE 12

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7500-01 7/25/23

FINDINGS / RECOMMENDATIONS

The preceding analysis has identified project conditions that may occur without modifications to the roadway network. The text that follows identifies a strategy for reducing roadway deficiencies with the proposed project where LOS F conditions are present. Recommended improvements are also identified for facilities that will have deficiencies in the roadway network without the project.

Existing Conditions

Intersections

All intersections, except the Missouri Flat Road / China Garden Road intersection operates within acceptable El Dorado County LOS thresholds during the a.m., midday and p.m. peak periods.

- Missouri Flat Road / China Garden Road: The westbound China Garden Road approach will operate at LOS F in the a.m. and p.m. peak hours. While this intersection is at the boundary of a segment allowed to operate at LOS F a conservative approach was undertaken assuming the LOS E threshold. The intersection meets the peak hour signal warrant.

  As a result of the mitigations identified in the *El Dorado County Public Safety Facility Project Draft EIR,* side street approaches to the Missouri Flat Road / China Garden Road intersection will be limited to right turns only. The DEIR noted two alternative mitigations for this intersection, installation of a traffic signal or limiting minor street access to right turns only.

  As part of the *El Dorado County Public Safety Facility Project* County staff determined that a signal at China Garden Road is not the preferred alternative based on the location of the future traffic signal at Industrial Drive; the signal at Industrial Drive was constructed as part of the Public Safety Facility project. Implementation of a right-turn only along China Garden Road will result in LOS D conditions for side street traffic in both a.m. (32.6 spv) and p.m. (25.1 spv) peak hours. Due to access considerations, the County determined that the right-in, right-out reconfiguration of the intersection will be modified once Diamond Springs Parkway is completed.

Queues

Under current conditions the three movements below have queues that exceed the available storage.

Missouri Flat Road / EB US 50 ramps
- NB through lane
- SB left turn lane

Missouri Flat Road / Mother Lode Drive
- SB through

Missouri Flat Road at US 50 Eastbound Ramps – Queues along the northbound through lane and the southbound left turn lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent closely spaced intersections. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Missouri Flat Road at Mother Lode Drive – Queues along the southbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent closely spaced US 50 Eastbound On-ramp intersection. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Roadway Segments

Missouri Flat Road, Golden Center Drive to China Garden Road. This segment operates at LOS F conditions in the two-lane segment; however, the v/c ratios in the peak periods are within the County's thresholds. No recommendations are required but, the roadway segment will be widened to four lanes as part of a future County CIP project.

Existing Plus Project Conditions

Intersections

All intersections except the Missouri Flat Road / China Garden Road intersection will operate within acceptable El Dorado County LOS thresholds during the a.m., midday and p.m. peak periods. The following recommendations are noted:

- Missouri Flat Road / China Garden Road: The China Garden Road approach will continue to operate at LOS F in the a.m. and p.m. peak hour. The intersection will meet the peak hour signal warrant. As noted earlier, the County determined that a signal at China Garden Road is not a practical alternative based on the installation of the traffic signal installed at Industrial Drive as part of the *El Dorado County Public Safety Facility Project*, and that right turn only access along China Garden Road is the preferred alternative. Implementation of the right-turn only restrictions along China Garden Road will result in LOS E condition in the a.m. peak hour (35.5 spv) and LOS C condition in the p.m. peak hour (21.9 spv) for side street traffic.

- The project shall contribute its fair share to the cost of regional circulation improvements via the existing countywide traffic impact mitigation (TIM) fee program.

- The project should construct the following improvements:

    - Install a crosswalk along the north side of the Forni Road / Golden Center Drive / Project intersection to indicate the preferred crossing location for pedestrians. The installation of a crosswalk on the north side will reduce the number of potential conflicts with motor vehicles as most vehicles at this intersection travel between Missouri Flat Road and Forni Road;
    - Install a crosswalk across the project driveway at the Golden Center Drive intersection;
    - As shown on the site plan, sidewalk should be installed along the entire project frontage on Forni Road;
    - The site plan shows a pathway / sidewalk constructed connecting the proposed pedestrian crossing on the north side of Golden Center Drive into the project site; this provides access to the fast food restaurant. As shown on the site plan the sidewalk along the curb return in the southwest corner of the Golden Center Drive / Project driveway intersection will connect to the internal pedestrian system to provide access to the retail building;
    - Install a No Parking Zone along the Forni Road project frontage to maximize sight distance at the driveway;
    - The County should consider conducting a speed survey to identify an appropriate posted speed limit along Forni Road in the project vicinity. Currently, the roadway is not signed which may confuse motorists as to the prima facie speed. Signs in advance of the Herbert Green Middle School provide a 25 mph speed limit when children are present.

The following on-site improvements should be constructed:

- A crosswalk at the fast-food drive-through entrance should be installed to provide pedestrian access across to Forni Road;
- Landscaping adjacent to any driveways, conveyor-system entrances and exits should be limited to vegetation no higher than 2 feet to provide visibility at key locations;
- Install a stop sign at the car wash conveyor-system exit;
- Truck access should be limited to off-hours as the drive aisles could be blocked while trucks are unloading;
- Install “Do Not Block” or Type V directional arrows markings and / or signage at internal intersections where one-way traffic flow is present.
- Add center line striping at the driveway and on Road 2233 between the north driveway and Missouri Flat Road
- Plant low lying vegetation in the west corner of the Road 2233 / Project Driveway intersection.

Queues

Under Existing plus Project conditions the five movements below have queues that exceed the available storage.

Missouri Flat Road / WB US 50 ramps
- NB through lane

Missouri Flat Road / EB US 50 ramps
- NB through lane
- SB left turn lane

Missouri Flat Road / Mother Lode Drive
- SB through

Missouri Flat Road / SR 49
- EB left turn

Missouri Flat Road at US 50 Westbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by the closely spaced adjacent intersections. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Missouri Flat Road at US 50 Eastbound Ramps – Queues along the northbound through lane and the southbound left turn lane will exceed the available storage. Storage length at this intersection is constrained by the closely spaced adjacent intersections. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Missouri Flat Road at Mother Lode Drive – Queues along the southbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent closely spaced US 50 Eastbound On-ramp intersection. No recommendations are made as retiming the corridor could increase delay and lengthen queues at the signals along the corridor.

Missouri Flat Road at SR 49 (Pleasant Valley Road) – Queues along the eastbound left turn lane will exceed the available storage by about 12 feet. This is less than one car length and is assumed to be contained within the left turn taper.

Roadway Segments

Missouri Flat Road, Golden Center Drive to China Garden Road. This segment will continue to operate at LOS F conditions in the two-lane segment. The v/c ratio will decrease to 1.20 and is within the County's v/c ratio threshold. No recommendations are necessary, and this roadway segment will be widened to four lanes as part of a future County CIP project.

2040 Conditions

Intersections

All intersections will operate within acceptable El Dorado County LOS thresholds during the a.m., midday and p.m. peak periods.

Queues

Under 2040 conditions the five movements below have queues that will exceed the available storage.

Missouri Flat Road / WB US 50 ramps
- NB through lane

Missouri Flat Road / EB US 50 ramps
- NB through lane

Missouri Flat Road / Mother Lode Drive
- SB through lane

Missouri Flat Road / Forni Road
- SB right turn lane

Missouri Flat Road / Diamond Springs Parkway
- EB right turn

Missouri Flat Road at US 50 Westbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent closely spaced intersections. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at US 50 Eastbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent closely spaced intersections. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Mother Lode Drive – Queues along the southbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent closely spaced US 50 Eastbound On-ramp intersection. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Forni Road – Queues along the southbound right turn lane will exceed the available storage. The storage length for the southbound right turn lane cannot be lengthened due to Missouri Flat Road being built out. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Diamond Springs Parkway – The eastbound right turn lane was assumed to be 250 feet. Queues along the eastbound right turn lane will exceed this distance. The County should confirm the right turn lane provides adequate storage in the Diamond Springs Parkway improvement plans.

Roadway Segments

All roadway segments will operate within the County level of service threshold, at LOS C or better.

2040 plus Project Conditions

Intersections

All intersections will operate within acceptable El Dorado County LOS thresholds during the a.m., midday and p.m. peak periods.

Queues

Under 2040 plus Project conditions the five movements below have queues that will exceed the available storage.

Missouri Flat Road / WB US 50 ramps
- NB through lane

Missouri Flat Road / EB US 50 ramps
- NB through lane

Missouri Flat Road / Mother Lode Drive
- SB through lane

Missouri Flat Road / Forni Road
- SB right turn lane

Missouri Flat Road / Diamond Springs Parkway
- EB right turn

Missouri Flat Road at US 50 Westbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by the closely spaced adjacent intersections. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at US 50 Eastbound Ramps – Queues along the northbound through lane will exceed the available storage. Storage length at this intersection is constrained by the closely spaced adjacent intersections. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Mother Lode Drive – Queues along the southbound through lane will exceed the available storage. Storage length at this intersection is constrained by the adjacent closely spaced US 50 Eastbound On-ramp intersection. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Forni Road – Queues along the southbound right turn lane will exceed the available storage. The storage length for the southbound right turn lane cannot be lengthened due to Missouri Flat Road being built out. The signal timing in the corridor was optimized for 2040 conditions. No further recommendations are made.

Missouri Flat Road at Diamond Springs Parkway – The eastbound right turn lane was assumed to be 250 feet. Queues along the eastbound right turn lane will exceed this distance. The County should confirm the right turn lane provides adequate storage in the Diamond Springs Parkway improvement plans.

Roadway Segments

All roadway segments will continue to operate within the County level of service threshold, at LOS C or better.

REFERENCES

1. Transportation Research Board, *Highway Capacity Manual*, 7th Edition
2. Caltrans *Highway Design Manual*, 2022
3. California *Manual of Uniform Traffic Control Devices*, 2014
4. Institute of Transportation Engineers. 2021. *Trip Generation*, 11th Edition. Washington, D.C.
5. Telephone and E-mail correspondence, Zach Oates, El Dorado County, May through July 2023
6. *Creekside Traffic Impact Study,* KD Anderson & Associates, Inc. December 2022
7. *El Dorado County Active Transportation Plan*, El Dorado County Transportation Commission, February 2020
8. *Western El Dorado County Short-Range and Long-Range Transit Plan Study*, LSC Transportation Consultants, Inc. November 2019
9. *Trip Generation Handbook*, Institute of Transportation Engineers, 3rd Edition, 2017
10. *El Dorado County Public Safety Facility Project Draft EIR*, Raney Planning and Management, February 2016
11. National Cooperative Highway Research Program (NCHRP) Report 255, *Highway Traffic Data for Urbanized Area Project Planning and Design,* December 1982
12. *Transportation Impact Study Guidelines*, El Dorado County Community Development Agency Long Range Planning, November 2014

APPENDICES

(under separate cover)

Flecker Associates
Transportation Engineers

August 31, 2023

Mr. Marc Strauch
STRAUCH & COMPANY
193 Blue Ravine Road, Suite 135
Folsom, CA 95630

RE: VEHICLE MILES TRAVELED (VMT) ANALYSIS FOR CREEKSIDE PLAZA RETAIL CENTER, EL DORADO COUNTY.

Dear Mr. Strauch

We have completed our Vehicle Miles Traveled (VMT) analysis for the Creekside Plaza revised site plan. The Creekside Plaza project is located on the north side of the Missouri Flat Road / Forni Road intersection (Figure 1). The site was approved by El Dorado County in 2020 with a different development plan (Figure 2), and at that time was the subject of a transportation impact analysis included in an environmental impact report approved by El Dorado County. An alternative site development plan is now proposed (Figure 3), and that plan is the subject of this analysis to identify the project's impact on VMT.

With the implementation of SB 743 the focus of a transportation impact analysis under CEQA moves from consideration of operating Level of Service (LOS) to evaluation of a project's effects on regional VMT. El Dorado County has adopted guidelines for evaluating VMT impacts under SB 743, and this report addresses the project's impacts based on those guidelines.

The materials which follow describe the approved and proposed land uses on the Creekside Plaza site and explain the methodology and significance criteria employed to determine regional VMT impacts. The results of analysis have been described in terms of quantitative analysis based on change to total county-wide VMT under El Dorado County guidelines, and a supporting qualitative analysis has also been provided that is based on review of the relationships between the project and its surrounding land uses.

PROJECT DESCRIPTION

Table 1 compares Creekside Plaza land use as approved and as now proposed. In general, the proposed project eliminates the professional office previously included and reduces the square footage of retail space and fast-food restaurant space. A gasoline station with convenience store and an automated car wash have been added.

TABLE 1
COMPARISON OF APPROVED AND PROPOSED CREEKSIDE PLAZA LAND USES

Land Use	Unit	Approved	Proposed
Professional Office	ksf	9.86	-
Strip Retail	ksf	18.15	7.95
Fast Food Restaurant with Drive-thru	ksf	2.55	2.25
Gas Station with Convenience Store	fueling positions	-	12
Automated Car Wash	tunnel	-	1

VMT ANALYSIS

Background. SB 743 changes the focus of transportation impact analysis in CEQA from measuring impacts to drivers to measuring the environmental impact of driving. The change has been made by replacing LOS with VMT. This change was made to align CEQA transportation impact analysis and mitigation with the State's goals for reducing greenhouse gas (GHG) emissions, to encourage infill development, and to improve public health through more active transportation. Level of Service is still used to assess a project's effects outside of CEQA and a traffic operational analysis under El Dorado County guidelines has been prepared for this project and documented separately.

In January 2019, the Natural Resources Agency finalized updates to the CEQA Guidelines including the incorporation of SB 743 modifications. The Guidelines' changes were approved by the Office of Administrative Law and are now in effect. The provisions apply statewide as of July 1, 2020.

To help aid lead agencies with SB 743 implementation, the Governor's Office of Planning and Research (OPR) produced the *Technical Advisory on Evaluating Transportation Impacts in CEQA*[1] (December 2018). This document provides guidance regarding the variety of implementation questions to be faced with respect to shifting to a VMT metric. Key guidance from this document includes:

- VMT is the most appropriate metric to evaluate a project's transportation impact.
- OPR recommends tour- and trip-based travel models to estimate VMT, but ultimately defers to local agencies to determine the appropriate tools.
- OPR recommends measuring VMT for residential and office projects on a "per capita" and "per employee" basis.
- OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable significance threshold. In other words, an office project that generates VMT per employee that is more than 85 percent of the regional average VMT per employee could result in a significant impact. OPR notes that this threshold is supported by evidence that connects this level of reduction to the State's emissions goals.
- OPR recommends that where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.
- OPR states that by adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Generally, OPR suggested that retail development including stores smaller than 50,000 square feet might be considered local serving.
- Lead agencies have the discretion to set or apply their own significance thresholds.

In 2019, the El Dorado County Transportation Commission completed the El Dorado County and City of Placerville SB 743 Implementation Plan (July 19, 2019) to support El Dorado County and the City of Placerville with implementation of SB 743, including the selection of VMT analysis methodology, setting

[1] *Technical Advisory on Evaluating Transportation Impacts in CEQA.* Governor's Office of Planning and Research State of California, December 2018.

thresholds of significance, and potential mitigation. With Resolution 141-2020[2] (October 6, 2020), the Board of Supervisors of the County of El Dorado adopted VMT thresholds of significance for purposes of analyzing transportation impacts under CEQA. The EL Dorado County VMT Guidelines notes that the methodology for establishing baseline VMT and calculating VMT is by use of the County's Travel Demand Model (TDM). However, the County allows different methods of calculating VMT if in the exercise of sound engineering judgment a different method is determined to be more accurate because of unique circumstances of a particular project or a particular use that is not captured in the TDM. The Travel Demand Model retail land uses are limited to a single generalized use and does not accurately represent the project land uses.

The *Technical Advisory* provides for a general threshold of 50,000 square-feet as an indicator as to whether a commercial use can be considered local serving or not. This is an important consideration in terms of a VMT-related significant impact determination. Based on the project location and the three identified retail uses, a gasoline station / C-store, an automated car wash and a fast-food restaurant, totaling 16,214 square feet the site falls within the local serving retail definition.

Page 16 of the *Technical Advisory* specifically addresses some of the key issues surrounding how a local serving retail store should be evaluated in terms of its VMT impact. As described, the threshold for significance is "a net increase." This means that if a proposed store produces one additional VMT, it would result in a finding of significance. However, the document further explains that local retail uses can be determined to result in an overall VMT reduction by the lead agency. This finding is consistent with the desire to develop more sustainable communities that have fewer transportation impacts. Commercial uses such as those proposed and located in local areas primarily serve pre-existing needs (i.e. they do not generate new trips because they meet existing demand). Because of this, local commercial uses can be presumed to reduce trip lengths when a new retailer is proposed. Essentially, the assumption is that someone will travel to a newly constructed local gas station, car wash or fast-food restaurant because of its proximity, rather than the proposed retailer fulfilling an unmet need. This dynamic results in an existing trip on the roadway network becoming shorter, rather than a new trip being added to the roadway network, which would result in an impact to the overall transportation system. Conversely, residential and office land uses often create new trips given that they introduce new participants to the transportation system. However, gas stations, car washes and fast-food restaurants do not generate entirely new trips that are added to the transportation system. As such, this means that the impact to the transportation system will be reduced by the introduction of a new gas station / C-store, car wash or fast-food restaurant that provides local service as its focus.

The *Technical Advisory* also provides that a less than significant finding can be further substantiated by showing the proximity of other similar uses. Although a specific market study is not being provided as part of this memorandum, maps showing the proximity of other similar stores are provided in Figures 4 through 6.

The County's VMT thresholds consider the VMT performance of residential and office components of a project separately, using the efficiency metrics of VMT per capita and VMT per employee, respectively. For retail components of a project, the County suggests that the county-wide VMT effect be analyzed. The

[2] *Board of Supervisors of the County of El Dorado Resolution 141-2020*. El Dorado County Board of Supervisors. October 2020.

El Dorado County VMT thresholds of significance are summarized below for each of these components:

- Residential – 15% below baseline unincorporated countywide VMT per Capita
- Commercial Office – 15% below baseline unincorporated countywide VMT per Employee
- Commercial Retail – No net increase in total regional VMT

Methodology and Assumptions. Based on the land uses that will be changed from the approved project, for the purposes of the VMT analysis and the determination of transportation related significant impacts, the proposed project was analyzed and compared to the "No Project" condition.

Quantitative Analysis

In order to estimate the Project's effect on area VMT, the Project area gas station, car wash and fast-food restaurant trips were evaluated before and after development of the Project. As noted above, these uses are generally local serving. i.e., serving the areas in proximity to their locations or along a travel route, i.e., US 50. These retail uses typically do not generate all new trips, but will also reroute trips from other locations. For example, there are limited fast food restaurants along Missouri Flat Road. The introduction of a new fast-food restaurant may reroute trips from either the few existing restaurants along Missouri Flat Road or from other fast-food restaurants located in different areas of El Dorado County.

Gas stations are a necessity for gasoline fueled vehicle operators. Customers will typically visit these uses that are closest to their residence or along their commute route. Since these uses are necessities, they typically do not generate all new trips to the area, but instead reroute trips from other facilities in the service area. Figure 4 shows the gas stations in the vicinity of Missouri Flat Road. Most of them have convenience stores of varying sizes attached. The gas stations are north of US 50 and along Pleasant Valley Road, with one gas station south of the project site along Missouri Flat Road.

Car washes have similar travel characteristics as gas stations as they are typically used by the local residents or along commute routes. They will not typically generate all new trips to the area but would reroute trips from existing sites. Figure 5 shows the location of the two car washes in the vicinity. One is located along Pleasant Valley Road at SR 49 while the other is located at the Forni Road / Placerville Drive/ US 50 Interchange east of Missouri Flat Road.

Fast-food restaurants with drive-through lanes have different characteristics than gas stations and car washes. As noted above, gas stations are a necessity for gasoline fueled vehicles. While some motorists have a relationship with a gas company, e.g., Costco, other motorists will refill at a convenient location. Fast-food restaurant visits, however, are based not only on convenience but also what the patron is interested in eating. Figure 6 presents the location of the various fast-food restaurants in the vicinity. Along Missouri Flat Road there are three fast food restaurants. The addition of a fourth fast food restaurant is likely to attract some patrons rerouting from the other three restaurants (i.e., pass-by trips), but it is also expected that new patrons may alter their trip from outside the area. For example, the closest Taco Bell restaurant is along Broadway in Placerville. A motorist in Placerville driving to Diamond Springs could forego stopping at the Placerville store and instead stop at the proposed location. In the extreme, a new trip could be shortened for someone in Diamond Springs not having to drive to Placerville.

Mr. Marc Strauch
Strauch & Company

Tables 2-5 summarize the projected change in customer trip length for the three uses: gas station, car wash and fast-food restaurant with drive-through lane. Based on the locations of each of the uses, the scarcity of similar uses surrounding the project and the project location in a rural area of El Dorado County the following assumptions were made in calculating the net change in VMT:

- The farthest distance traveled for fast food restaurant choices was 1.75 miles
- The farthest distance traveled for gas was 1.75 miles
- The farthest distance traveled for a car wash was 1.75 miles
- Diverted trips were assumed from US 50; the farthest diverted distance to a fast-food restaurant was 1.6 miles.
- No affect on VMT was assumed for pass-by trips for gas station and car wash land uses.

TABLE 2
Change in Daily VMT due to Project Primary and Diverted Trips – Gas Station

Origin/Destination	Trips	Change in Distance (mi)	Change in VMT
North	62	0.18	11.4
South	347	1.59	553.3
East	396	-0.34	-134.3
West	186	-0.71	-131.4
Total	**991**	-	**299.0**

TABLE 3
Change in Daily VMT due to Project Primary and Diverted Trips – Car Wash

Origin/Destination	Trips	Change in Distance (mi)	Change in VMT
North	22	-0.44	-9.7
South	127	1.06	135.3
East	144	-0.91	-130.6
West	157	-0.71	-110.9
Total	**991**	-	**-115.9**

TABLE 4
Change in Daily VMT due to Project Primary and Diverted Trips – Fast Food Restaurant

Origin/Destination	Trips	Change in Distance (mi)	Change in VMT
North	25	-0.50	-12.5
South	145	-0.75	-108.1
East	164	0.10	17.2
West	178	-0.59	-105.7
Total	**991**	-	**-209.1**

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TABLE 5 Change in Daily VMT due to Project Pass-By Trips – Fast Food Restaurant[1]			
Origin/Destination	**Trips**	**Change in Distance (mi)**	**Change in VMT**
North	196	-0.09	-17.7
South	196	-0.11	-21.6
East	48	-0.25	-12.0
West	50	-0.20	-10.2
Total	**490**	**-**	**-61.5**
[1]Gas Station and Car Wash pass-by trips do not exist due to no similar land use in project vicinity.			

Overall, the project will result in shorter trips. This is consistent with the OPR technical Advisory discussion on local serving retail projects. Table 6 presents the total projected net change in daily VMT due to the project. The project is expected to produce a net decrease of 87.5 VMT. Therefore, the project would not exceed the County's no-net increase threshold for retail land uses and is expected to result in a less than significant impact.

TABLE 6 Net Change in Daily VMT due to Project	
Trip Type	Change In VMT
Primary and Diverted – Gas Station	299.0
Primary and Diverted – Car Wash	-115.9
Primary and Diverted – Fast Food Restaurant	-209.1
Pass-By	-61.5
Net Change	**-87.5**

Findings

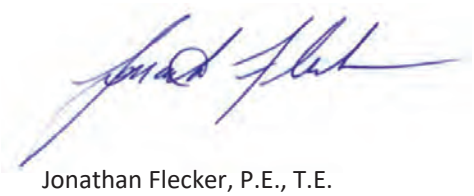
Based on the results of this analysis, the following finding is made:

- The analysis summarizes that the addition of the proposed Project can shorten trip lengths and result in a decrease in VMT.

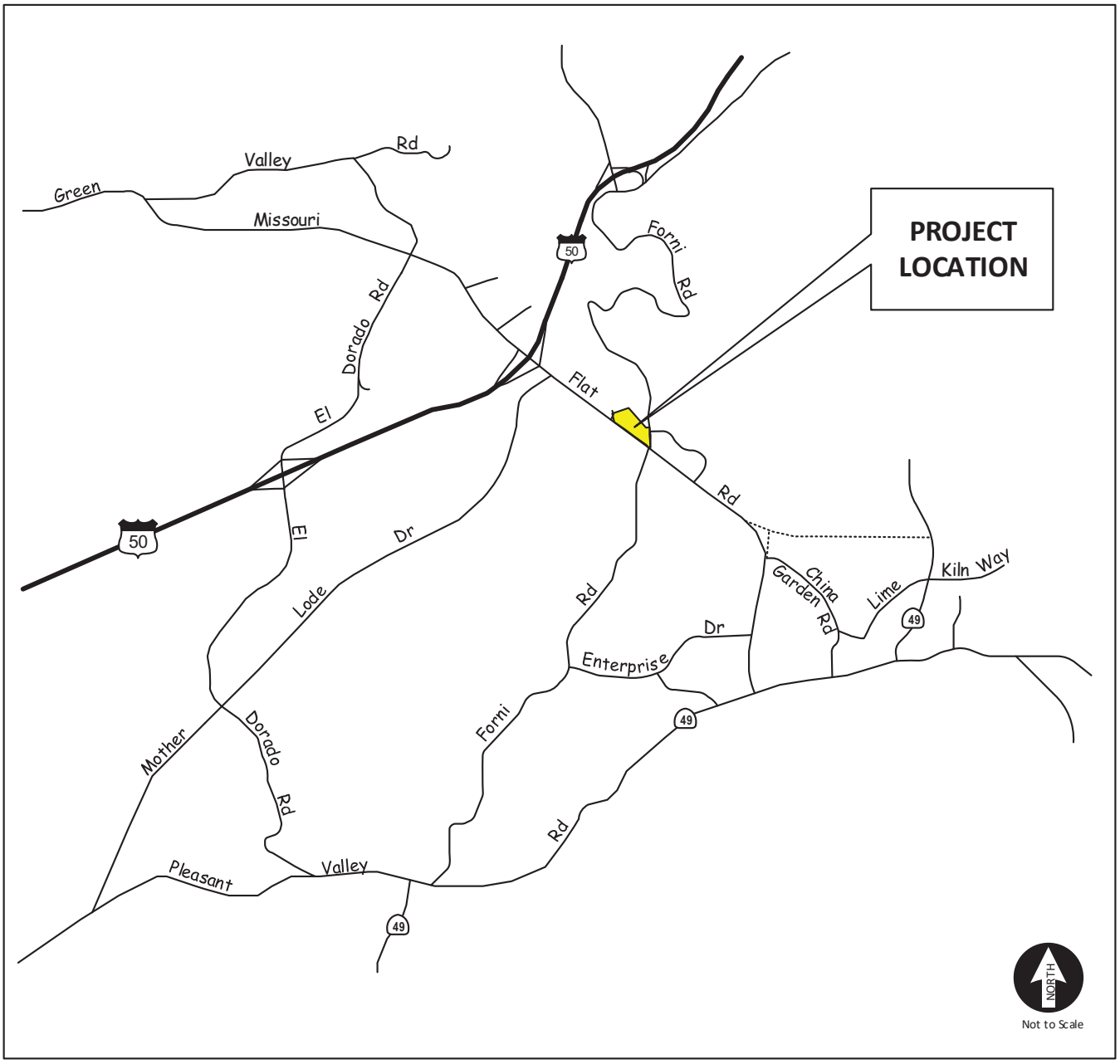
Thank you for contacting our firm. Please feel free to call me if you have any questions or need more information.

Sincerely Yours,

Flecker Associates



Jonathan Flecker, P.E., T.E.
President



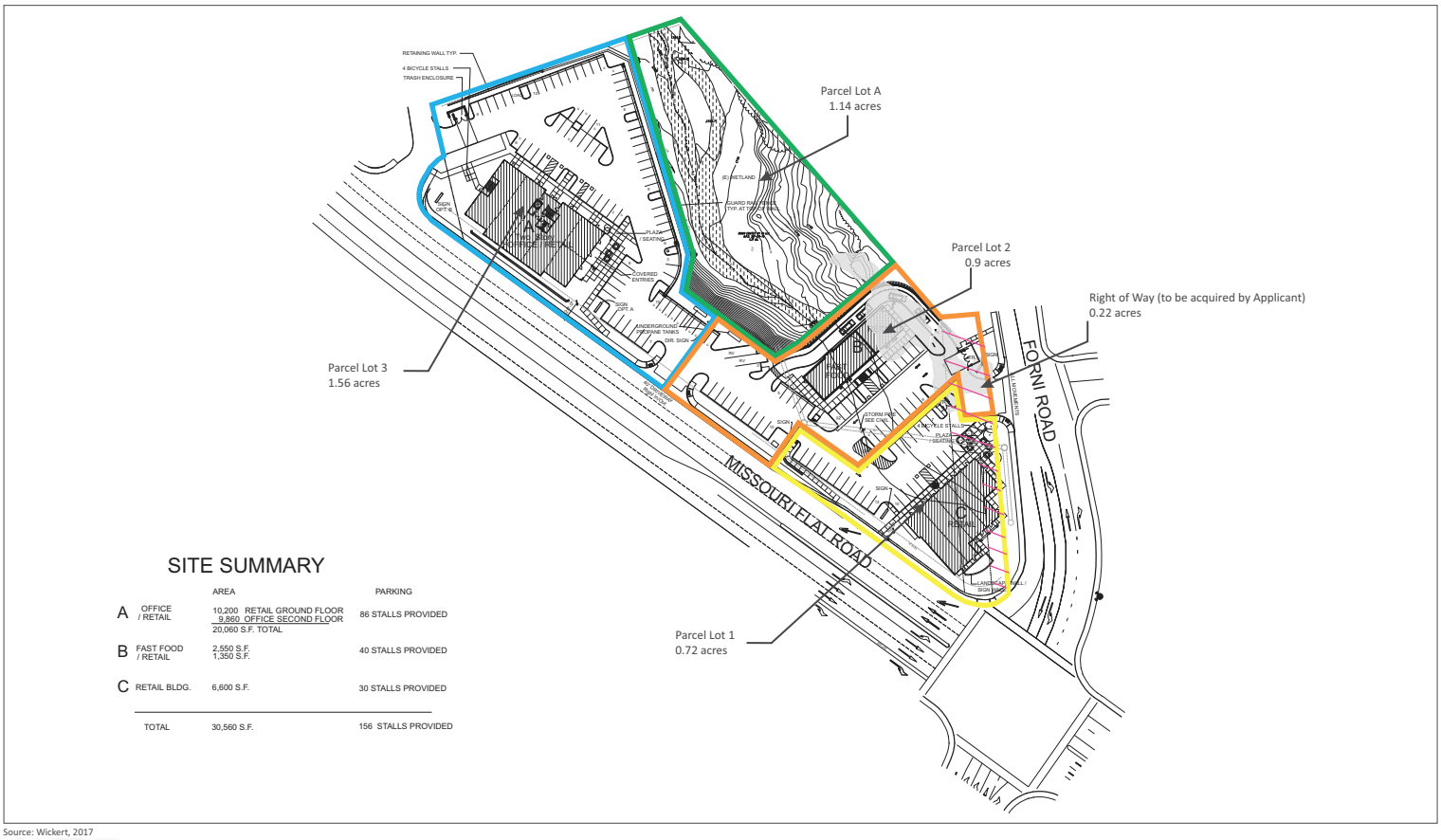
VICINITY MAP

FLECKER ASSOCIATES

7500-01.1

FIGURE 1

PD-R21-0002/CUP21-0004/P-E25-0001 CREEKSIDE PLAZA ARCO
EXHIBIT T - VMT ANALYSIS



Source: Wickert, 2017

FirstCarbon SOLUTIONS

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Exhibit 3
Site Plan

EL DORADO COUNTY • CREEKSIDE PLAZA
ENVIRONMENTAL IMPACT REPORT

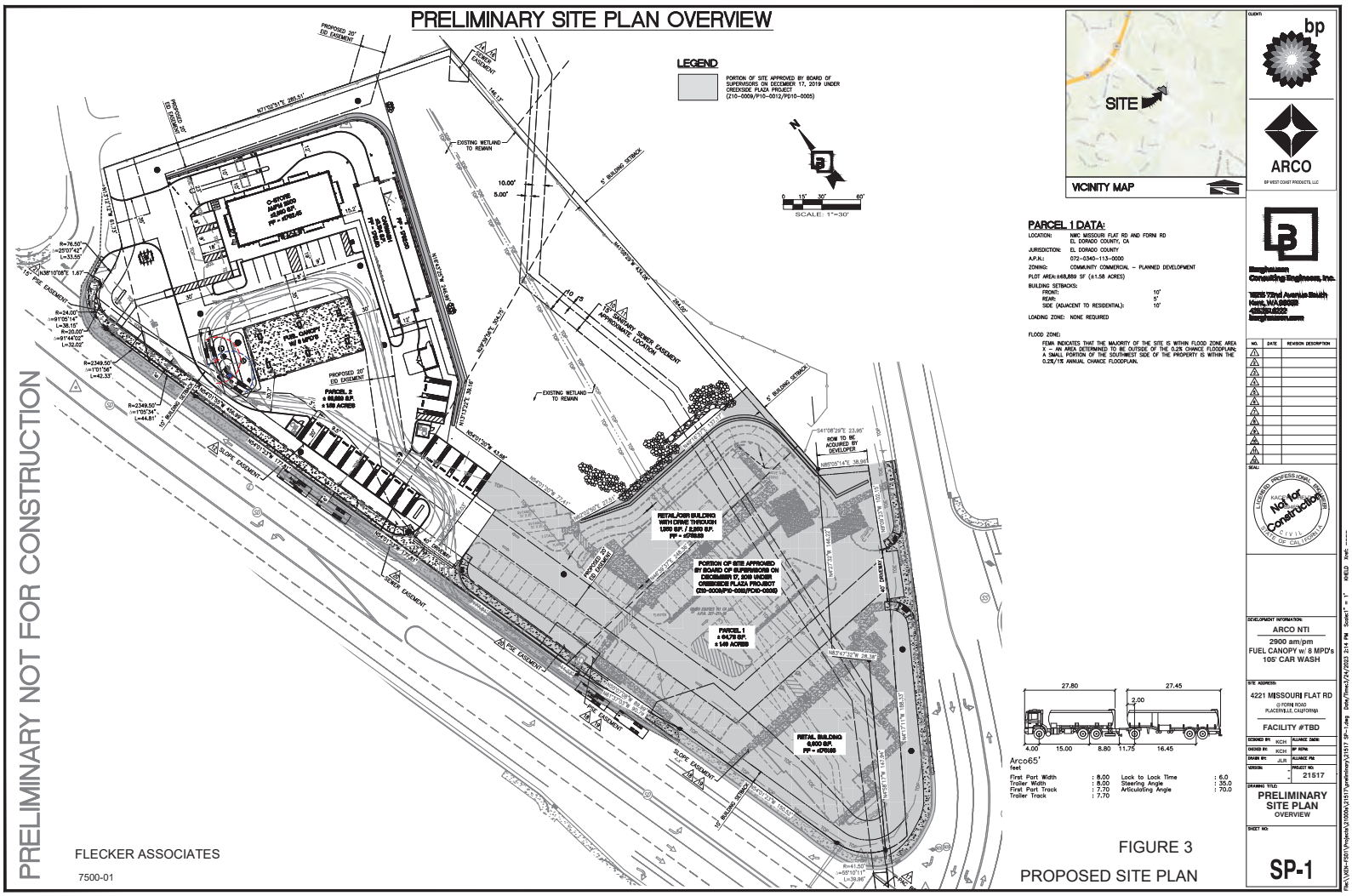
FLECKER ASSOCIATES

7500-01

FIGURE 2

APPROVED SITE PLAN - 2020

PD-R21-0002/CUP21-0004/P-E25-0001 CREEKSIDE PLAZA ARCO
EXHIBIT T - VMT ANALYSIS



PD-R21-0002/CUP21-0004/P-E25-0001 CREEKSIDE PLAZA ARCO
EXHIBIT T - VMT ANALYSIS

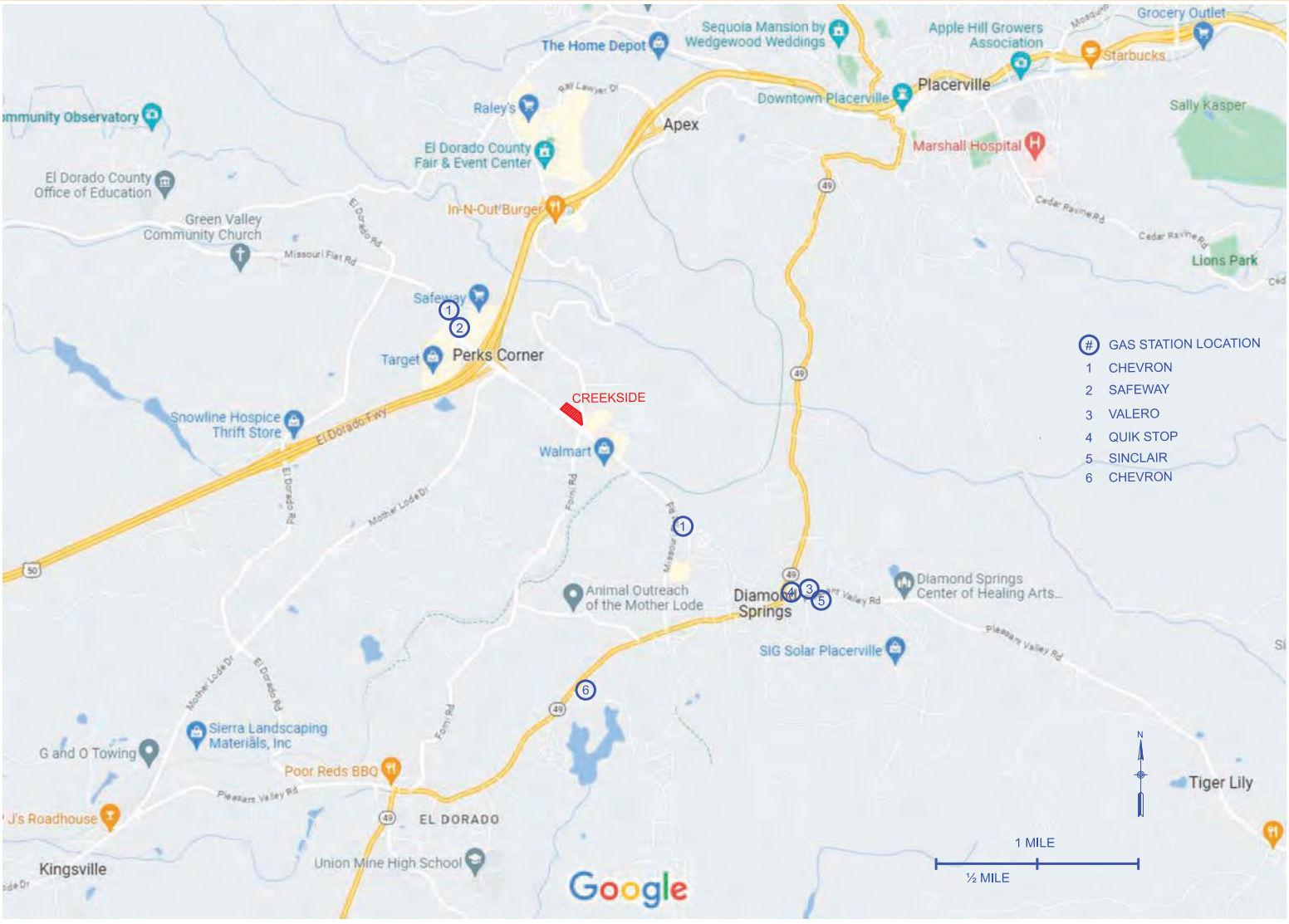


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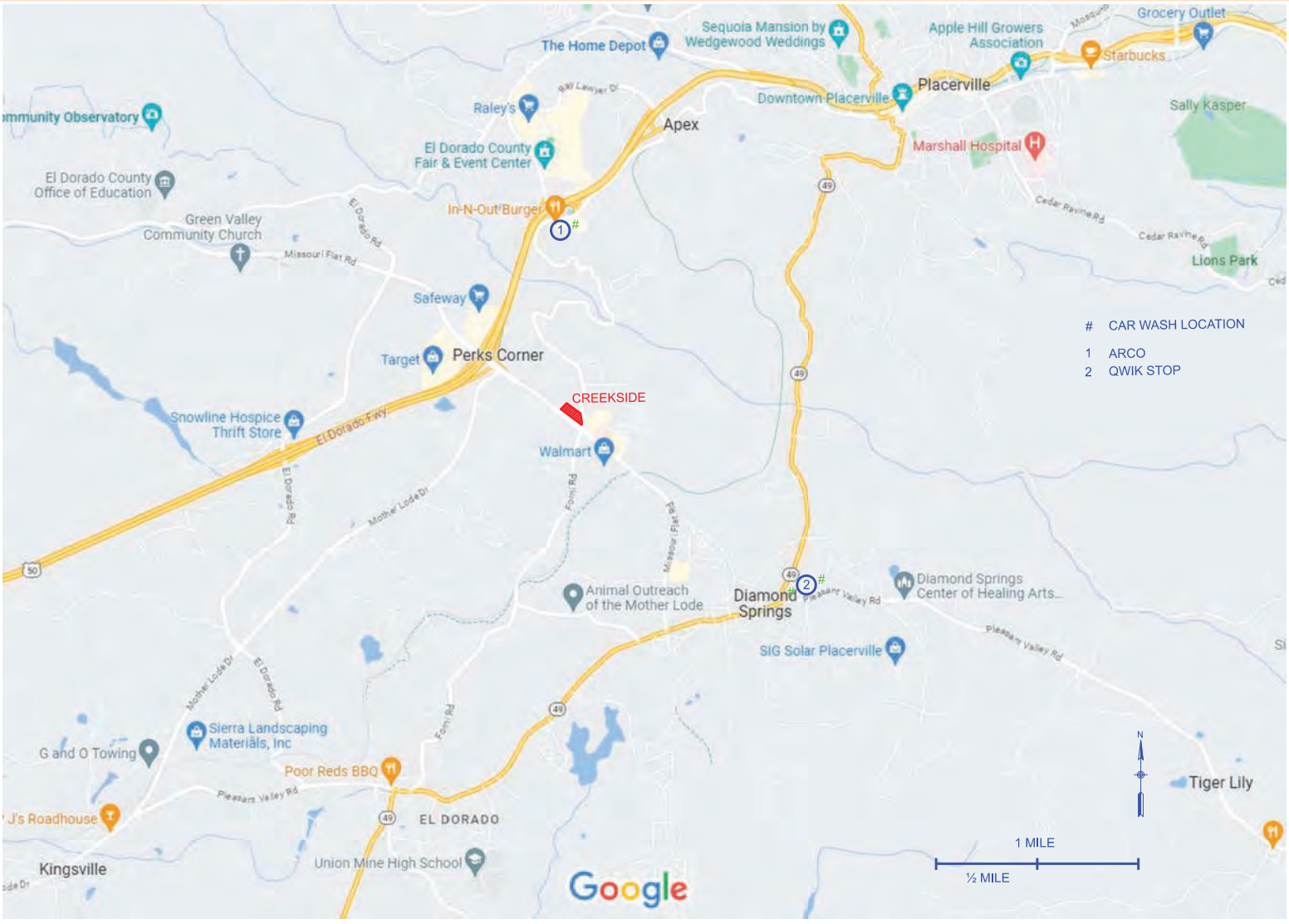
FIGURE 4
GAS STATION LOCATIONS

PD-R21-0002/CUP21-0004/P-E25-0001 CREEKSIDE PLAZA ARCO
EXHIBIT T - VMT ANALYSIS



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7500-01

FIGURE 5
CAR WASH LOCATIONS

PD-R21-0002/CUP21-0004/P-E25-0001 CREEKSIDE PLAZA ARCO
EXHIBIT T - VMT ANALYSIS

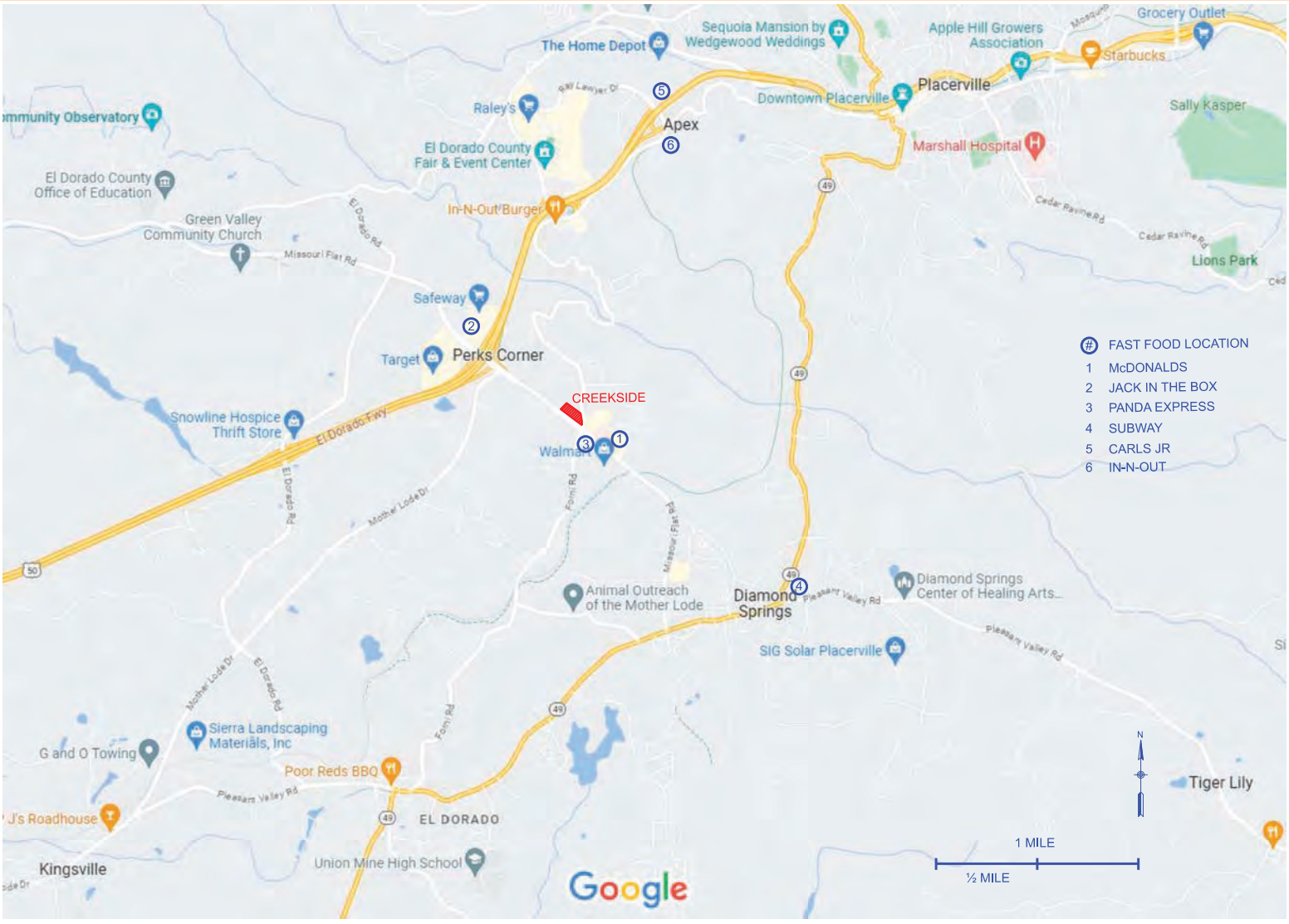

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FIGURE 6
FAST FOOD RESTAURANT LOCATIONS