



# Technical Memorandum

November 27, 2024

<b>To</b>	El Dorado County – Zack Oates, Senior Civil Engineer Caltrans District 3 – Satwinder Dhatt, Local Development Review, Equity, and System Planning,		
<b>From</b>	Frank Penry, PE, TE, PTOE Peter Galloway, Senior Transportation Planner Emily Darke, Staff Engineer, EIT		
<b>CC</b>	Sandeep Dhanda, Owner Melvin Higginbotham, Architect, MHA Design Services	<b>Email</b>	Sandeepdhanda@yahoo.com
<b>Subject</b>	PA21-0021 Cool Automotive & Commercial Project – Traffic Impact Analysis Memorandum ( <b>Revised</b> )	<b>Project no.</b>	12579129

## 1. Introduction

The following technical memorandum prepared by GHD presents the results of a revised traffic impact analyses for the proposed Cool Automotive and Commercial Center project (convenience market, fuel facility, drive-through restaurant, future retail pad, and car wash). Previous draft technical memorandums assessing the traffic impacts of the proposed project were published (*GHD, September 2022, September 2023, February 2024, & June 2024*) and reviewed by both the County of El Dorado and Caltrans.<sup>1 2 3</sup>As a result of comments received from both agencies, the project site plan has been revised/improved and proposed project land uses have been consolidated. Agency comments related to proposed project trip generation and assignment have been addressed. Circulation related to truck access, vehicle queuing, and pedestrian/bicycle safety associated with the adjacent Class I multi-use path has been further evaluated. A quantitative vehicle miles traveled (VMT) analysis has been provided based on Big Data using the GIS-based platform (Replica). Finally, the most recent comments associated with specific recommended improvements identified as part of the recent State Route 49 American River Confluence Study and project driveway design have been incorporated into the analysis.<sup>4</sup>

The proposed project site would be located on the northeast quadrant of the State Route 49 and State Route 193 intersection in Cool, California. The proposed project would develop an existing vacant parcels (APN# 071-080-007 & APN# 071-500-036). This updated Traffic Impact Analysis Memorandum (TIAM) satisfies the

<sup>1</sup> DKS Associates, Peer Review of the Transportation Impact Analysis for the Cool Automotive & Commercial Project, Project #21197-015, Memorandum from Josh Pilachowski (DKS) to Zach Oates (El Dorado County), May 11, 2023.

<sup>2</sup> Satwinder Dhatt, Local Development Coordinator, Caltrans, District 3, PA21-0021, Higginbotham (Cool Automotive & Commercial Project), June 19, 2023.

<sup>3</sup> Caltrans, Higginbotham / Cool Automotive and Commercial Project (PA21-0021 & DR22-0007), Comment memorandum(s) to Valerie Brady, El Dorado County, June 23, 2023 & July 9, 2024.

<sup>4</sup> DKS Associates, Peer Review of the Transportation Impact Analysis for the Cool Automotive & Commercial Project, Project #21197-015, Memorandum from Jim Damkowitch (DKS) to Zach Oates (El Dorado County), April 5, 2024.

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requirements per the County of Eldorado and Caltrans Guidelines. **Figure 1.1** presents the study area map and project location.

The term “project,” as used in this report, refers to the updated development uses as follows:

- Development of the existing vacant lot on the northeast quadrant of the State Route 49 (SR 49) and State Route 193 (SR 193) intersection. The proposed developments are as follows:
  - **Main building(s) comprising of 9,787 square feet**
    - Convenience Store - 4,620 square feet
    - Drive-Through QSR Restaurant - 2,585 square feet
    - Future Retail Pad – 2,582 square feet
  - **Fueling facility with island and canopy and car wash of 6,176 square feet**
    - Above ground fueling tanks (2-20,000-gallon tanks)
    - 6-pump (12 vehicle fueling positions) fuel facility/canopy – 3,024 square feet
    - Automated Car Wash – 1,892 square feet

The proposed project is located in the Town of Cool in Eldorado County. Currently, the adjacent parcel located directly north of the project site contains a United States Post Office. The parcel(s) directly west of the proposed project site (across SR 49) contain a mix of restaurant, fueling, and retail uses. Finally, the parcels located on the southeast quadrant of the SR 49/SR 193 intersection contain a florist and larger retail center with a Holiday Market, medical facilities, brewpub, and other smaller retail stores.

Included in this memorandum are analyses and discussion of the following items:

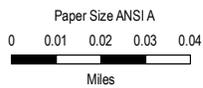
- Technical analysis parameters and methodologies.
- Existing study locations, data collection, and existing conditions assumptions.
- Project description including quantification of trip generation and trip distribution associated with the proposed project.
- Existing Plus Project Conditions (Year 2022)
- Near-Term plus Project (Year 2032).
- Vehicle Miles Traveled (VMT) analysis related to the SB 743 and the trip characteristics of the proposed project associated with location, size, and screening criteria.
- Cumulative Analysis, including No Project and Plus Project Conditions (Year 2042).
- Impact Determination and Mitigation Measures.

Consistent with the City’s guidelines, the following traffic scenarios were analyzed for this project:

- Existing Conditions (Year 2022)
- Existing (Year 2022) Plus Project Conditions
- Near-Term (Year 2032) No Project Conditions
- Near-Term (Year 2032) Plus Project Conditions
- Cumulative (2042) No Project Conditions
- Cumulative (2042) Plus Project Conditions

The above traffic scenarios are described in further detail and evaluated in subsequent sections.

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Map Projection: Mercator Auxiliary Sphere  
 Horizontal Datum: WGS 1984  
 Grid: WGS 1984 Web Mercator Auxiliary Sphere



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 TRAFFIC IMPACT ANALYSIS MEMORANDUM

**STUDY AREA MAP**

Project No. 12579129  
 Revision No. -  
 Date 07/10/2022

**FIGURE 1.1**

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Data source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
 Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community. Created by: edarke

## 2. Project Background

The proposed project includes development of a gas station with 12 vehicle fueling positions, a 4,620 square-foot convenience market, a 2,585 square-foot quick service restaurant (QSR) with drive-through lane, a 2,582 square-foot future retail pad, and an 1,892 square-foot car wash on APN#'s 071-080-007 & 071-500-036. The proposed project is located at the corner of SR 49 (Coloma Road) and SR 193 (Georgetown Road) on the northeast quadrant of the intersection.

The proposed development has two (2) primary access driveways to distribute the site traffic on the adjacent State Highways. From SR 49, a full-access driveway would serve the project site and be located approximately 400-feet north of SR 193 (Georgetown Road). A second full-access driveway would be located on SR 193 directly opposite Ellinghouse Drive approximately 600-feet east of SR 49. This project driveway would form a standard four-way intersection (southbound leg) with the SR 93/Ellinghouse Drive intersection. The project site plan is shown in **Figure 2.1**.

### 2.1 Purpose and Need

The purpose of this development is to provide improved fueling, convenience market, and restaurant services to vehicles traveling to their destinations. The proposed project is consistent with the County of El Dorado's General Plan land use and regional travel demand model zoned for General Commercial (GC-DC). The proposed site is located along two State Highways (SR 49 and SR 193) with access north to Auburn and south to Coloma and Sutter's Mill. Regional connection to the project site would be via SR 49 to/from the north to Interstate 80 at Auburn.

### 2.2 Study Intersections and Roadway Segments

Four primary intersections adjacent to and providing access to the project site were selected for evaluation in coordination with the County of El Dorado and Caltrans Highway Operations staff for the weekday AM and PM peak hour conditions. The study intersections for the project are listed below:

1. Northside Drive at Highway 49 (Coloma Road)
2. Project Driveway at Highway 49 (Coloma Road)
3. Highway 49 (Coloma Road) at Highway 193 (Georgetown Road)
4. Project Driveway at Ellinghouse Road and Highway 193 (Georgetown Road)

In addition to key intersection analyses, the following roadway segments were evaluated for volume capacities adjacent to the proposed project site:

- Highway 49 (Coloma Road) north of Highway 193 (Georgetown Road)
- Highway 49 (Coloma Road) south of Highway 193 (Georgetown Road)
- Highway 193 (Georgetown Road) east of Highway 49 (Coloma Road)

The roadway network that provides primary vehicle circulation for the project study area includes Highway 49, Highway 193, Northside Drive, and Ellinghouse Road. Regional access is provided by Interstate 80 north of the project site. A brief description of each roadway follows:

**Highway 49 (SR 49)** is a regional highway that extends north-south through California's foothills and Gold Country. Starting in the north state, Highway 49 extends south from SR 70 extending through Sierra City, Downieville, Nevada City, Grass Valley, Auburn, Coloma, Placerville, and Mariposa to Oakhurst. In the project study area, SR 49 is a two-lane facility with a two-way-left-turn lane. The roadway also has wide (4-5') painted shoulders both north and south of Highway 193 but lacks frontage improvements.



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The posted speed limit on Coloma Road is 45 mph. Based on the most recent Caltrans volume data, SR 49 carries 8,800 annual average daily traffic (AADT) with 5.6% truck traffic. It is noted that a Class I pedestrian-bike shared use path extends along the west side of SR 49 starting immediately south of its intersection with SR 193 to Cave Valley Road (a distance of approximately 1 mile).

**Highway 193 (SR 193)** extends east from SR 49 is a two-lane facility with no frontage improvements. SR 193 provides access east to Greenwood and Georgetown before extending south to Spanish Flat, Kelsey, and Placerville. SR 193 has left-turn/right-turn pockets at major street intersections in the study area with a posted speed limit of 55 mph. Based on the most recent Caltrans volumes, SR 193 carries 7,800 AADT with 7.3% truck traffic. It is noted that a Class I pedestrian-bike shared use path extends along the north side of SR 193 between SR 49 and American River Trail (a distance of approximately 0.9 miles).

**Northside Road** is located immediately north of the proposed project site and extends east from Highway 49 approximately 600-feet north of SR 193. A narrow roadway (18-feet), Northside Road provides access to existing United States Post Office facilities and self-storage areas. A new development that occurred on the south side of the roadway (Dollar General Store) improved Northside Road (i.e., widened) along its frontage to Highway 49.

**Ellinghouse Road** is located south of the proposed project site extending a relatively short distance (1,200 - feet) between Highway 193 and Highway 49. Ellinghouse Road provides access to the newer Holiday Market commercial-retail center located on the southeast quadrant of the Highway 49/Highway 193 intersection and has two travel lanes.

Regional access to the project study area is provided by **Interstate 80** which extends in an east-west direction approximately 9 miles north of the project site via Highway 49 at Auburn. Interstate 80 provides access west to Sacramento, Davis, and the Bay Area. To the east, Interstate 80 provides access to Truckee and Reno before continuing to through the adjacent states of Nevada, Utah, and Wyoming all the way to the east coast. I-80 is a multi-lane facility at Auburn.

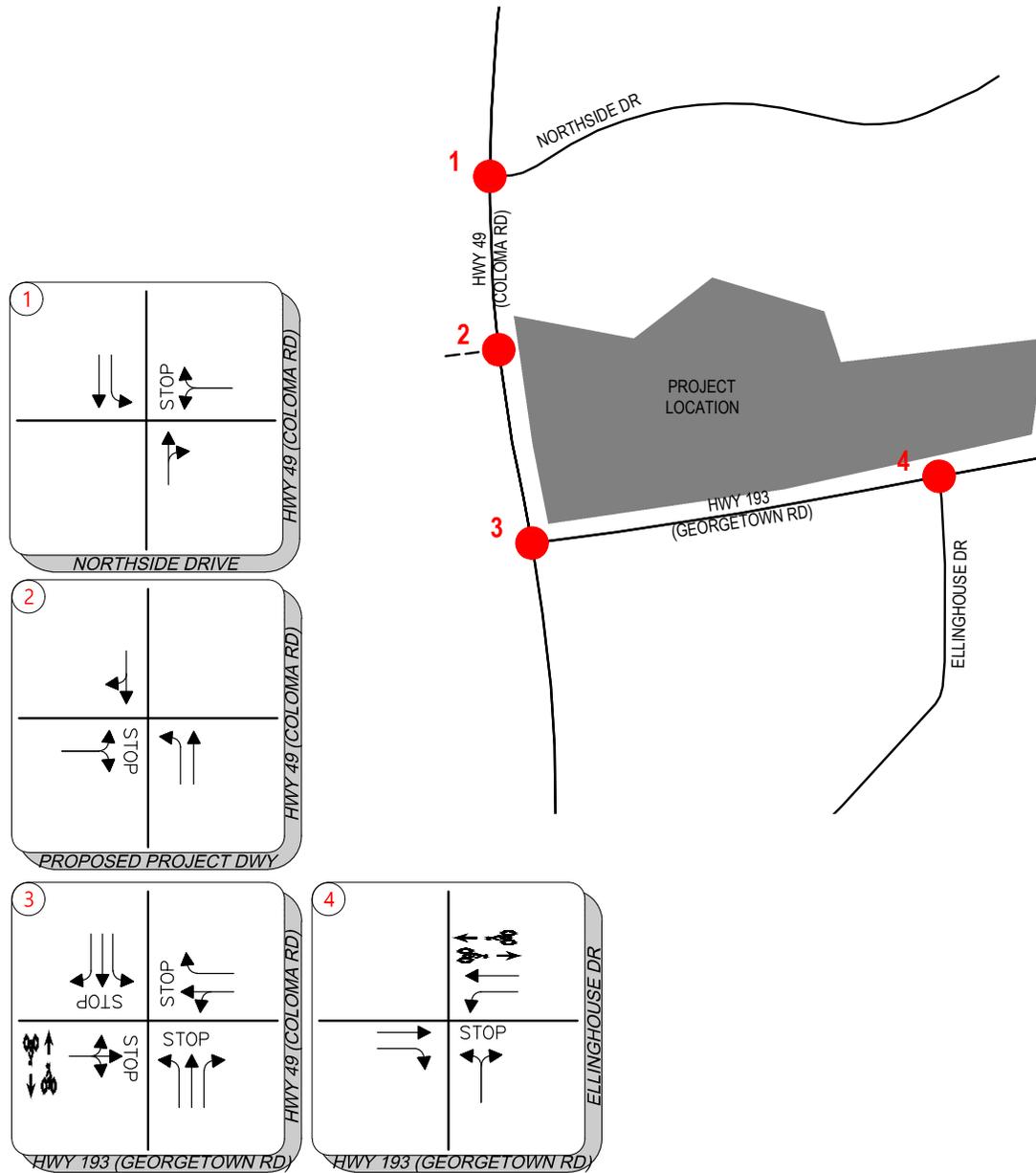
## 2.3 Data Collection and Analysis

Recent transportation analyses were conducted for the Cool General Retail Project DEIR (El Dorado County, SCH# 2020049050, January 2021). Currently under construction, the project (Dollar General Store) is located immediately north of the proposed project site and gains vehicle access from Northside Drive. Vehicle count data for associated traffic analyses was collected for both the weekday AM peak period (7:00-9:00 a.m.) and PM peak period (4:00-6:00 p.m.) at the SR 49 intersections located at Northside Drive and SR 193. Vehicle count data collected as part of the Dollar General Store (KDA, 2020) traffic analysis was used for comparison purposes and consistency to ensure a conservative estimate of overall vehicle operations in the study area.

For the purposes of proposed project analysis, new intersection turning movement counts for the **four** existing intersections were collected on Thursday, July 28, 2022 during the AM peak and PM peak periods based on Caltrans direction. The traffic data collection was conducted to capture peak summer tourist traffic during weekday conditions. The AM peak hour is defined as the one continuous hour of peak traffic flow counted between 7:00 AM and 9:00 AM, and the PM peak hour is defined as the one continuous hour of peak traffic flow counted between 4:00 PM and 6:00 PM under typical weekday conditions. **Figure 2.2** presents the study intersections with existing lane configuration and traffic control. Intersection peak hour counts are included in **Attachment A** of this memorandum and shown in **Figure 2.3**.

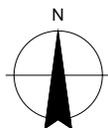
Northside Drive is stop-sign controlled at SR 49 (T- intersection) for the westbound direction. A two-way-left-turn lane (TWLTL) is present on SR 49. The SR 49/SR 193 intersection is all-way-stop-controlled with a flashing beacon. Finally, the existing Ellinghouse Drive/SR 193 intersection is stop-sign controlled for the northbound (T- intersection) approach at SR 193. There is a separate westbound left-turn lane and separate eastbound right-turn lane from SR 193 providing access onto Ellinghouse Drive.

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LEGEND:

- BICYCLE LANE
- VEHICLE LANE
- STOP STOP CONTROL

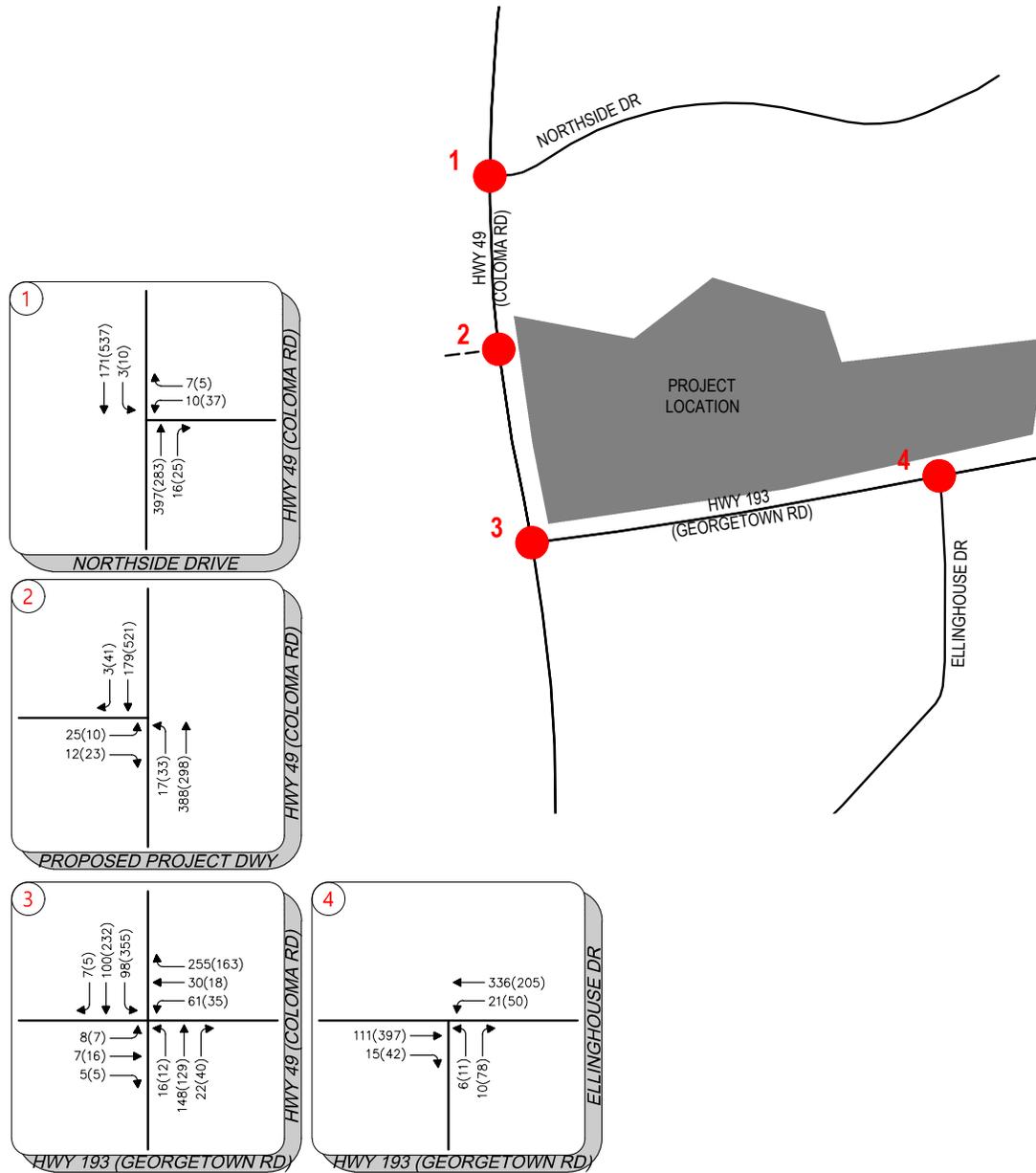


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 TRAFFIC IMPACT ANALYSIS MEMORANDUM  
 EXISTING LANE CONFIGURATION AND  
 TRAFFIC CONTROL

Project No. 12579129  
 Date 8/29/2023

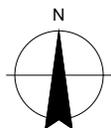
FIGURE 2.2

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**LEGEND:**

XX - AM PEAK HOUR TRAFFIC VOLUMES  
 (XX) - PM PEAK HOUR TRAFFIC VOLUMES



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 EXISTING PEAK HOUR VOLUMES

Project No. 12579129  
 Date 8/29/2023

**FIGURE 2.3**

### 3. Technical Analysis & Methodologies

#### 3.1 Transportation and VMT Methodologies

Technical analysis parameters and methodologies for the traffic study have been based on the County of El Dorado traffic impact analysis guidelines, *Transportation Impact Study Guidelines, November 2014*, and consistent with policies adopted in *2004 El Dorado County General Plan Transportation and Circulation Element (Amended December 10, 2019)*.

Senate Bill (SB) 743 was signed into law in 2013, with the intent to better align CEQA practices with statewide sustainability goals related to efficient land use, greater multimodal choices, and greenhouse gas reductions. The provisions of SB 743 became effective Statewide on July 1, 2020. Under SB 743, automobile delay, traditionally measured as level of service (LOS), are no longer considered an environmental impact under CEQA. Instead, impacts are determined by changes to VMT. However, traffic impact analyses have been conducted in tandem with additional VMT analyses consistent with County guidelines and direction.

The following section outlines the analysis parameters and methodologies that will be used in the transportation impact study to quantify the measures of effectiveness for the analysis scenarios.

#### 3.2 Level of Service Methodologies

Levels of Service (LOS) will be calculated for all study intersection control types using the methods documented in the Transportation Research Board Publication, *Highway Capacity Manual, Sixth Edition, A Guide for Multimodal Mobility Analysis, 2016* (HCM 6). HCM 6 methodology is consistent with both the County of El Dorado and Caltrans guidelines. In addition, per the County of El Dorado's, *Transportation Impact Study Guidelines*, this analysis will also include project access, circulation, and analysis of multimodal infrastructure.

In an effort to maintain consistency with the County of El Dorado's *General Plan* policies for transportation facilities, level of service methodologies for intersections will be used to determine if the project causes an increase in traffic that is substantial and adverse in relation to the traffic load and capacity of the existing street system. Level of Service is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to an intersection, or roadway segment, representing progressively worsening traffic conditions. LOS "A" represents free-flow operating conditions and LOS "F" represents over-capacity conditions.

##### 3.2.1 Intersection Operations

The Synchro 10 (Cubic) software program will be used to implement the HCM 6 analysis methodologies for the study intersections. Intersection Level of Service (LOS) will be calculated for all control types using the methods documented in HCM 6. For unsignalized intersections, the intersection LOS represents the worst minor-street movement controlled by a stop sign.

Vehicles queue lengths at project driveways and intersection turn pockets will be evaluated using microsimulation. *Simtraffic* traffic simulation software was used in capturing real world queuing conditions. The average of five (5) microsimulation runs were used in capturing 95<sup>th</sup> percentile queue. The vehicular-based LOS criteria for different types of intersection controls are presented in **Table 3.2**.

To determine whether "significance" should be associated with unsignalized intersection operations, a supplemental traffic signal "warrant" analysis will also be completed. The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the need for installation of a traffic signal at an otherwise unsignalized intersection. This study will employ the signal warrant criteria presented in the latest edition of California's Manual on Uniform Traffic Control Devices (CA MUTCD) for all study intersection(s). The signal warrant criteria are based upon several factors including volume of vehicular and pedestrian traffic, frequency of accidents, location of school areas etc. The CA

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**TABLE 3.2 – LEVEL OF SERVICE (LOS) CRITERIA FOR INTERSECTIONS**

LOS	Type of Flow	Delay	Maneuverability	Stopped Delay / Vehicle (sec)	
				Signalized	Unsignalized / AWSC, TWSC, and Roundabouts
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	≤10.0	≤10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10 and ≤20.0	>10 and ≤15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>20 and ≤35.0	>15 and ≤25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable	Maneuverability is severely limited during short periods due to temporary back-ups.	>35 and ≤55.0	>25 and ≤35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55 and ≤80.0	>35 and ≤50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0

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MUTCD indicate that the installation of a traffic signal should be considered if one or more of the signal warrants are met. The ultimate decision to signalize an intersection should be determined after careful analysis of all intersections and area characteristics.

This traffic operations analysis will specifically utilize the Peak-Hour-Volume based Warrant 3 as one representative type of traffic signal warrant analysis. Warrant 3 criteria are identical for both Warrant 3 provides the option to use the lower threshold criteria (*CA MUTCD Figure 4C-4*) if the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000.

### 3.2.2 Highway (Two-Lane) Roadway Segment Levels of Service

Two-lane roadway segments will be analyzed using methodologies based on the Highway Capacity Manual 2010 (HCM) consistent with El Dorado County TIS guidelines and other recent transportation studies conducted for development projects in the study area. HCM classifies two-lane highways into three types including Classes I, II, and III based on travel speeds, trip lengths, and demographic/developed areas. Based on measures of effectiveness or (MOE) the LOS calculations incorporate average travel speeds (ATS), Percent Time Spent Following (PTSF), and Percent of Free-Flow Speed (PFFS). The LOS criteria for two-lane highways per El Dorado County peak hour segment volumes are shown in **Table 3.3**.

**TABLE 3.3 EL DORADO COUNTY PEAK HOUR ROADWAY SEGMENT LOS CRITERION**

		HCM 2010 Planning Level Volumes				
Code	Functional Class Codes (Updated to HCM 2010)	A	B	C	D	E
2A	Two-Lane Arterial	---	---	850	1,540	1,650
<i>Freeway LOS based on HCM 2010, Exhibit 10-8, Urban Area, Rolling Terrain, K-factor on 0.09, and D-factor of 0.60</i> <i>2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, .09 K-factor and D-factor of 0.6</i> <i>Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed of 45 mi/h</i> <i>Volumes are for both directions unless noted</i>						

### 3.3 Agency LOS Guidelines, Policies, and Transportation Studies

The four study intersections are within the County of El Dorado's and Caltrans jurisdictions on State Route 49 and State Route 193. Key policies and thresholds are listed below.

#### 3.3.1 County of El Dorado Policies and LOS Guidelines

In conformance with the County of El Dorado General Plan Transportation and Circulation Element (July 2004, Amended August 2019), the following policies would apply to proposed project development:

**GOAL TC-X:** To coordinate planning and implementation of roadway improvements with new development to maintain adequate levels of service on County Roads.

**Policy TC-Xc** Developer paid traffic impact fees combined with any other available funds shall fully pay for building all necessary road capacity improvements to fully offset and mitigate all direct and cumulative traffic impacts from new development during peak hours upon any highways, arterial roads, and their intersections during weekday, peak-hour periods in unincorporated areas of the county. (Resolution 201-2018, September 25, 2018)

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**Policy TC-Xd** Level of Service (LOS) for County-maintained roads and state highways within the unincorporated areas of the county shall not be worse than LOS E in the Community Regions or LOS D in the Rural Centers and Rural Regions except as specified in Table TC-2 (shown below). The volume to capacity ratio of the roadway segments listed in Table TC-2 shall not exceed the ratio specified in that table. Level of Service will be as defined in the latest edition of the Highway Capacity Manual (Transportation Research Board, National Research Council) and calculated using the methodologies contained in that manual. Analysis periods shall be based on the professional judgment of the Department of Transportation which shall consider periods including, but not limited to, Weekday Average Daily Traffic (ADT), AM Peak Hour, and PM Peak Hour traffic volumes.

<b>TABLE TC-2            EL DORADO COUNTY ROADS ALLOWED TO OPERATE AT LEVEL OF            SERVICE F<sup>1</sup>            (Through December 31, 2018)</b>		
<b>Road Segment(s)</b>		<b>Max. V/C<sup>2</sup></b>
Cambridge Road	Country Club Drive to Oxford Road	1.07
Cameron Park Drive	Robin Lane to Coach Lane	1.11
Missouri Flat Road	U.S. Highway 50 to Mother Lode Drive	1.12
	Mother Lode Drive to China Garden Road	1.20
Pleasant Valley Road	El Dorado Road to State Route 49	1.28
U.S. Highway 50	Canal Street to junction of State Route 49 (Spring Street)	1.25
	Junction of State Route 49 (Spring Street) to Coloma Street	1.59
	Coloma Street to Bedford Avenue	1.61
	Bedford Avenue to beginning of freeway	1.73
	Beginning of freeway to Washington overhead	1.16
	Ice House Road to Echo Lake	1.16
State Route 49	Pacific/Sacramento Street to new four-lane section	1.31
	U.S. Highway 50 to State Route 193	1.32
	State Route 193 to county line	1.51
<b>Notes:</b>		
<sup>1</sup> Roads improved to their maximum width given right-of-way and physical limitations.		
<sup>2</sup> Volume to Capacity ratio.		

Source: El Dorado County, Attachment 5, File # DR00-001, Measure Y Revisions to 2004 El Dorado County General Plan, July 19, 2004.

As noted above in the County's Table TC-2, specific segments of Highway 49 are allowed to operate at LOS F in the project study area. In the project study area, this includes the approximate 0.8 segment of

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Highway 49 between Highway 50 to State Route 193 to the project's southern intersection. The SR 193 to Placer County Highway 49 segment then extends along the project frontage to the Placer County line.

**Policy TC-Xe** For the purposes of this Transportation and Circulation Element, "worsen" is defined as any of the following number of project trips using a road facility at the time of issuance of a use and occupancy permit for the development project:

- A. A 2 percent increase in traffic during the a.m. peak hour, p.m. peak hour, or daily, 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.

**Policy TC-Xf** 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 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.

**Policy TC-Xg** Each development project shall dedicate right-of-way, design and construct or fund any improvements necessary to mitigate the effects of traffic from the project. The County shall require an analysis of impacts of traffic from the development project, including impacts from truck traffic, and require dedication of needed right-of-way and construction of road facilities as a condition of the development. This policy shall remain in effect indefinitely unless amended by voters.

**Policy TC-3c** The County shall encourage new development within the Community Regions and Rural Centers to provide appropriate on-site facilities that encourage employees to use alternative transportation modes. The type of facilities that may include bicycle parking, shower and locker facilities, and convenient access to transit, depending on the development size and location.

**Policy TC-4i.** Within Community Centers and Rural Centers, all development shall include pedestrian/bike paths connecting to adjacent development and to schools, parks, commercial areas, and other facilities where feasible. In Rural Regions, pedestrian/bike paths shall be considered as appropriate.

As noted in Section 3.1 (VMT Analysis), while LOS policies may apply to the findings of consistency for the proposed project, LOS may not be used to determine a significant transportation impact under CEQA. However, the County's transportation policies do include related LOS thresholds for County maintained roads and state highways within unincorporated areas. For operational purposes, the County's policies are generally consistent with Caltrans policies that strive to "maintain a target LOS at the transition between LOS C and LOS D on state highway facilities." For the purpose of this analysis (when evaluating the operational characteristics of intersections and roadways), a target LOS of D will be the threshold. However, as noted the standard for SR 49 in the project study area is LOS F based on El Dorado County Road Standards.

This traffic study will specifically utilize the Peak-Hour-Volume based Warrant 3 as one representative type of traffic signal warrant analysis. Since Warrant 3 provides specialized warrant criteria for intersections with rural characteristics (e.g., located in communities with populations less than 10,000 persons or with adjacent major streets operating above 40 mph), the study intersection will be evaluated with this specialized criterion.

This traffic study focuses on the evaluation of the traffic operating conditions and any subsequent traffic impacts and the recommended mitigation. The study incorporates appropriate heavy vehicle adjustment factors, peak hour factors, and lane geometry/storage capacity and reports the resulting intersection delays and LOS as estimated using the HCM 6 based analysis methodologies. The Synchro 11 (Trafficware) software

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program was used to implement the HCM 6 analysis methodologies. Synchro 11 has the capability to produce results using HCM 2016 methodologies, and takes into account intersection geometry, delay, and queue lengths.

### 3.3.2 State Route (SR) 49 American River Confluence Study

Based on discussions with County Engineering staff, other potential circulation improvements have been suggested for the study area along the SR 49 corridor identified as part of State Route 49 American River Confluence Study.<sup>5</sup> The study evaluated the corridor segment of SR 49 between the community of Cool north to the City of Auburn looking at “Existing Issues” associated with “overcrowding, accessibility, and the general safety of the corridor.” Two issues identified by County staff include over-sized truck traffic and intersection operations along the corridor. The analysis found that over-sized truck traffic (STAA sized vehicles 48-58’ KPRA) are problematic along the SR 49 corridor in general and particularly in the segment between SR 193 north to Auburn given the limited curve radii and narrow travel lanes. Some of the key recommendations for over-sized trucks (not all) along the SR 49 and project study area in Cool are as follows:

- Identify locations in Placerville and Auburn and place signage to deter oversized trucks from entering the corridor.
- Install signage at multiple locations in Auburn, and the I-80 interchanges with Elm Avenue and SR 49 in Auburn to direct oversized truck traffic away from the SR 49 study corridor.
- Encourage local and regional agencies to coordinate with the CHP to encourage greater enforcement on SR 49 including ticketing STAA-sized vehicles (48-53 feet KPRA).
- Encourage local and regional agencies to partner with Caltrans and the CHP to form a Goods Movement Committee to establish a forum for addressing oversized truck usage in the Confluence.
- Pursuant to the conditions of approval established as part of the entitlement process and approval of the Dollar General Store located in Cool, coordinate with El Dorado County to better enforce Dollar General Store truck restrictions in the Confluence.

In addition to deterring over-sized truck traffic along the SR 49 corridor, the study also identified intersection operation at the SR 49/SR 193 intersection.

- Perform an Intersection Control Evaluation (ICE) study at the intersection of SR 49 and SR 193 to determine suitability of a roundabout or other configuration that would support future traffic volumes should they reach a level unsupported by the current stop control intersection.

It is noted that the suggested operational analyses of the SR 49/SR 193 are supported by Caltrans.

## 3.4 Technical Analysis Parameters

The traffic study provides a “preliminary operational level” evaluation of traffic operating conditions at the study intersection. The evaluation incorporated appropriate heavy vehicle adjustment factors, peak hour factors, lane geometries, etc. **Table 3.4** summarizes the intersection technical analysis parameters used within the study.

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<sup>5</sup> DKS Associates, State Route (SR) 49 American River Confluence Study, Final Report, Prepared for El Dorado County Transportation Commission, February 2023.

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**TABLE 3.4 – TECHNICAL ANALYSIS PARAMETERS**

Technical Parameters	Assumption
1. Intersection Peak Hour Factor (PHF)	Field recorded PHF for Existing & Existing plus Project Scenarios 0.92 PHF in AM and PM peak hours for Cumulative and Cumulative Plus Project Scenarios
2. Intersection Heavy Vehicle	Minimum of 2% and/or Heavy Vehicle Counts per movement recorded in field

## 4. Transit

Transit service in El Dorado County is provided primarily by the El Dorado County Transit Authority (EDCTA) in community and rural areas adjacent to SR 50. These include the communities of Placerville, Diamond Springs, Cameron Park, and Pollock Pines. There are also commuter routes extending between western El Dorado County and downtown Sacramento. Dial-a-Ride service is provided to outlying areas not served by standard routes. Between fixed route and commuter service routes, there are a total of 9 routes in western El Dorado County. In addition, life-line service is provided to elderly and/or disabled patrons as well as Sacramento commuters. Currently, no EDTCA bus route serves the Community of Cool.

In addition to EDTCA service, there is a Sacramento/South Lake Tahoe connecting bus service (Lake Tahoe Transit). Based on the EDCTA’s website, “The Sacramento Commuter provides 11 trips in the morning for Park and Ride locations in Western El Dorado County to downtown Sacramento and 11 return trips in the afternoons Monday through Friday, as well as reverse commuter trips twice daily.”

## 5. Pedestrian-Bicycle

Pedestrian and bicycle facilities in the project study area consist primarily of pedestrian crosswalks, and Class I (off-street) pedestrian-bike shared use paths. In the immediate project study area, pedestrian and bicycle facilities are limited to the immediate SR 49/SR193 intersection. An all-way-stop-controlled facility (with stop-sign warning lights and flashing beacon); the SR 49/SR 193 intersection has a north-south pedestrian crosswalk on SR 193 (east side of intersection) and an east-west pedestrian crosswalk on SR 49 (south side of intersection). As noted, Class I (off-street) pedestrian-bike shared use paths are located along the north side of SR 193 and SR 49 along the west side of the highway. The pedestrian crosswalks at the SR 49/SR 193 link the two Class I shared use paths.

## 6. Collision Analysis

A collision analysis was conducted for the study area to determine any trends or patterns that may indicate a safety issue at adjacent intersections and roadways in the study area. Collision rates are calculated based on records provided by the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. In addition, a collision rate analysis using the Traffic Accident Surveillance and Analysis System (TASAS) records (*Caltrans, 2022*) was incorporated for the SR 49 segment between. The most current five (5) year period from January 1, 2017 through December 31, 2021 was analyzed.

Collision characteristics and rates for the three primary existing study intersections are shown in **Table 6.1**.



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**TABLE 6.3—TASAS ROADWAY SEGMENT COLLISION RATES**

Segment	Total # of Collisions	Fatal Collisions	Injury Collisions	ACTUAL (per million vehicle miles)			AVERAGE (per million vehicle miles)		
				Fatal Collisions	Fatal + Injury Collisions	Total	Fatal Collisions	Fatal + Injury Collisions	Total
ED-49 PM 34.237- 34.582	7	0	2	0.000	0.59	2.05	0.037	0.67	1.41

Source: Caltrans, District 3 Office of Traffic Safety, TASAS collision analysis, March 23, 2022.

## 7. Existing Conditions (Year 2022)

The Existing Conditions have been modelled to analyze current traffic volumes and establish the baseline traffic performance. The existing scenario reflect opening year 2022 conditions.

### 7.1 Intersection Operations

**Table 7.1** summarizes the intersection performance during the AM and PM peak hour at Existing Conditions.

**TABLE 7.1 -EXISTING CONDITIONS INTERSECTION LOS**

ID	Intersection	Peak Hour	Existing		
			Control	Delay	LOS
1	Highway 49 (Coloma Road) & Northside Drive	AM	TWSC	12	B
		PM		14.7	B
2	Highway 49 (Coloma Road) & Retail Driveway/Project Driveway	AM	TWSC	11.6	B
		PM		14	B
3	Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)	AM	AWSC	10.9	B
		PM		14.6	B
4	Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)	AM	TWSC	10.2	B
		PM		13.1	B
<p><b>BOLD</b> Indicate LOS of D or worse</p> <p>1 TWSC = Two-Way-Stop-Control, Vehicle delay based on minor street stopped traffic (worst case).</p> <p>2 AWSC = All-Way-Stop-Control, Vehicle delay based on average delay for each approach (worst case).</p>					

As presented in **Table 7.1**, all four project study intersections along SR 49 and SR 193 are operating at acceptable conditions (LOS B or better) during the AM and PM peak hour. All *Synchro* results are included in **Attachment C**.

The 95<sup>th</sup> percentile queue lengths were also analyzed using microsimulation (through *Simtraffic* Software) for the study intersection. All *Simtraffic* results are included in **Attachment D**.

As shown in **Table 7.2**, all storage lengths are adequate to store the 95<sup>th</sup> percentile vehicle queues at the four study intersections based on *SimTraffic* microsimulation. Field observations did indicate minor (3-5 vehicles) vehicle queuing for the westbound right-turn movement from SR 193 at SR 49 and the northbound through-

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movement on SR 49 at SR 193. However, all observed vehicle queuing at the SR 49/SR 193 quickly dissipated and overall vehicle progression was acceptable.

**TABLE 7.2 – EXISTING CONDITIONS QUEUING CHARACTERISTICS**

Int. #	Intersection/Approach	Control Type	Existing No Project 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
<b>1</b>	<b>Highway 49 (Coloma Road) &amp; Northside Drive</b>				
	Westbound Left/Right	TW SC	40	50	100
	Southbound Left		10	20	150
<b>2</b>	<b>Highway 49 (Coloma Road) &amp; Retail Driveway/Project Driveway</b>				
	Eastbound Left/Right	TWSC	50	50	75
	Northbound Left		15	45	100
	Southbound Thru/Right		0	5	145
<b>3</b>	<b>Highway 49 (Coloma Road) &amp; Shopping Center Driveway/Highway 193</b>				
	Eastbound Left/Thru/Right	AWSC	30	30	140
	Westbound Left/Thru		45	45	540
	Westbound Right		75	60	90
	Northbound Left		30	30	150
	Northbound Thru		80	70	650
	Northbound Right		45	45	110
	Southbound Left		50	115	200
	Southbound Thru		50	70	340
	Southbound Right		15	10	200
<b>4</b>	<b>Ellinghouse Drive &amp; Highway 193 (Georgetown Road)</b>				
	Eastbound Right	TWSC	0	0	175
	Westbound Left		15	35	220
	Northbound Left/Right		45	65	155

Note: **Red** text indicates queues that exceed available storage  
Weekday AM & PM peak hour and Weekend midday peak hour

## 7.2 Roadway Segment Level of Service

**Table 7.3** identifies the existing roadway segment LOS in the project study area along SR 49 and SR 193. As shown, roadway segments on SR 49 (north and south of SR 193) and SR 193 (east of SR 49) are operating at LOS D or better during the AM and PM peak hour (worst case volumes shown).

**TABLE 7.3 ROADWAY SEGMENT LOS; EXISTING CONDITIONS**

Code	Functional Class Codes (Updated to HCM 2010)	HCM 2010 Planning Level Volumes				
		A	B	C	D	E
2A	Two-Lane Arterial	---	---	850	1,540	1,650
	State Route 49 north of State Route 193				855	
	State Route 49 south of State Route 193			481		
	State Route 193 east of State Route 49			627		

Freeway LOS based on HCM 2010, Exhibit 10-8, Urban Area, Rolling Terrain, K-factor on 0.09, and D-factor of 0.60  
2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, .09 K-factor and D-factor of 0.6  
Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed of 45 mi/h  
Volumes are for both directions unless noted

## 7.3 Signal Warrants

Based on the CA MUTCD peak hour signal warrant criteria (Warrant #3) for all four study intersections were evaluated using Warrant 3: Peak Hour Factor. The peak hour warrant is one of several warrants used to determine if installation of a traffic signal is appropriate. Qualifying for signalization using the peak hour

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warrants does not necessarily mean a signal should be installed as other hours of the day might experience undue delay. Therefore, the decision to install a traffic signal should be based on further analysis utilizing the additional warrants for signalization as presented in the CA MUTCD. Under Existing Conditions, the SR 49/SR 193 intersection would qualify for signalization under Figure 4C-4 (70% Option) (the warrant graphs are provided in Attachment B) without near-term, proposed project, or cumulative traffic volumes. The remaining three study intersections would not qualify for signalization with existing volumes at this time, due to the low minor street volumes. To meet the peak hour warrant, the highest minor street approach must be 75 vehicles or greater with a corresponding major street volume of approximately 1200 vehicles for the 70% condition. For all of the conditions, the remaining three study intersections do not meet these volume thresholds.

## 8. Near-Term Year 2032 (No Project) Conditions

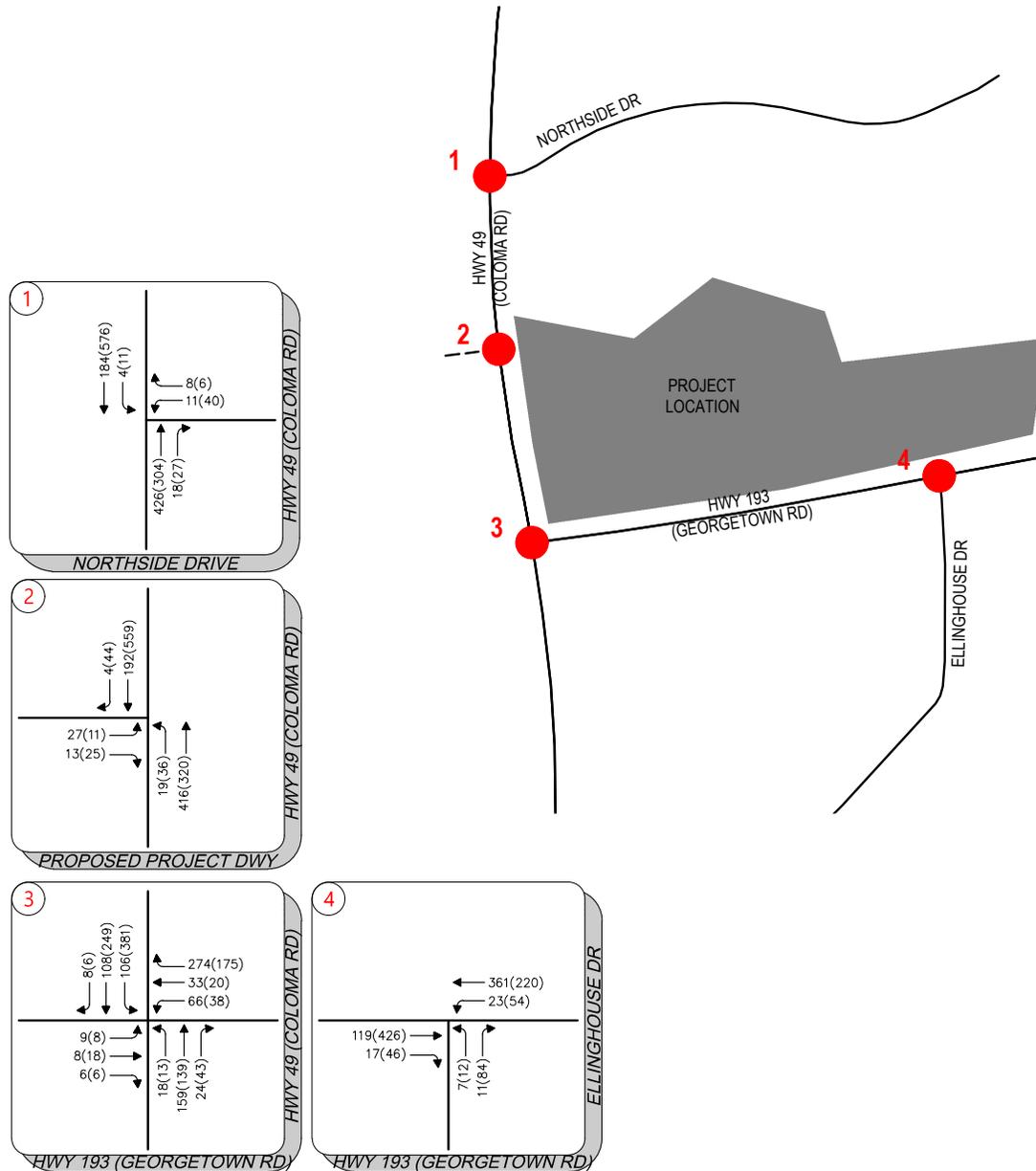
### 8.1 Traffic Model Projections

Near-Term Year 2032 (No Project) Conditions refer to the analysis scenario that would exist following approximately ten years of development in El Dorado County and the surrounding area of Cool but excludes the development of the proposed project. Consistent with the County's TIS guidelines, the El Dorado County Travel Demand Model was obtained to generate base year (2018) and future year (2040) project volumes (EDCTDM plots are attached in Attachment E). EDCTDM output was used to develop an annual growth rate. Based on future year traffic volumes projections, the existing traffic volumes were grown up by 0.72% per year or 7.4% for the 10-year period (2022 opening year to 2032 near-term year) to coincide with 2032 traffic conditions.

Additionally, El Dorado County Planning and Engineering staff were contacted for any other local approved/pending developments in the area (*August 2022*). At this time, no other development projects are anticipated in the project study area. Peak hour traffic volumes from the recent Dollar General Store development adjacent to the proposed project site are contained within the recent vehicle counts collected for this analysis.

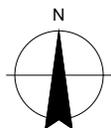
Near-Term Year 2032 (No Project) AM and PM peak hour intersection volumes are shown in **Figure 8.1**.

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**LEGEND:**

XX - AM PEAK HOUR TRAFFIC VOLUMES  
 (XX) - PM PEAK HOUR TRAFFIC VOLUMES



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**FIGURE 8.1**

## 8.2 Planned Circulation Improvements

Based on discussions with County of El Dorado and Caltrans staff, no short-term (or long-term) circulation improvements are planned for the immediate project vicinity area along SR 49 and/or SR 193. The most recent circulation improvements were to Northside Drive located immediately north of the proposed project site. As part of the Dollar General Store development, Northside Drive was improved with new pavement and a pedestrian sidewalk on the south side of the street connecting to SR 49. There is a potential for the Class II on the east side of SR 49 to be extended north past the project frontage to provide access to the Olmstead Loop Trailhead area. However, beyond that provided as part of proposed project frontage improvements nothing is approved at this time.

## 8.3 Intersection Operations

**Table 8.1** summarizes the intersection performance during the AM and PM peak hour and compares Existing (No Project) Conditions and Near-Term Year 2032 (No Project) Conditions.

As presented in **Table 8.1**, all four project study intersections along SR 49 and SR 193 would be operating at acceptable conditions (LOS C or better) during the AM and PM peak hour under Near-Term (No Project) Conditions. All *Synchro* results are included in **Attachment C**.

The 95<sup>th</sup> percentile queue lengths were also analyzed using microsimulation (through *Simtraffic* Software) for the study intersection. As shown in **Table 8.2**, all storage lengths are adequate to store the 95<sup>th</sup> percentile vehicle queues at the four study intersections based on SimTraffic microsimulation under Near-Term (No Project) Conditions.

**TABLE 8.1 EXISTING (NO PROJECT) AND NEAR-TERM YEAR 2032 (NO PROJECT) INTERSECTION LOS**

ID	Intersection	Peak Hour	Existing			Near Term		
			Control	Delay	LOS	Control	Delay	LOS
1	Highway 49 (Coloma Road) & Northside Drive	AM	TWSC	12.0	B	TWSC	12.4	B
		PM		14.7	B		14.9	B
2	Highway 49 (Coloma Road) & Retail Driveway/Project Driveway	AM	TWSC	13.6	B	TWSC	14.4	B
		PM		17.1	C		17.5	C
3	Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)	AM	AWSC	10.9	B	AWSC	11.8	B
		PM		14.6	B		18.7	C
4	Ellinghouse Drive/Highway 193 (Georgetown Road)	AM	TWSC	10.5	B	TWSC	10.9	B
		PM		13.5	B		13.6	B

**BOLD** Indicates LOS of D or worse

- 1 TWSC = Two-Way-Stop-Control, Vehicle delay based on minor street stopped traffic (worst case).
- 2 AWSC = All-Way-Stop-Control, Vehicle delay based on average delay for each approach (worst case).

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**TABLE 8.2 NEAR-TERM YEAR 2032 (NO PROJECT) QUEUING CHARACTERISTICS**

Int. #	Intersection/Approach	Control Type	Near Term No Project 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
<b>1</b>	<b>Highway 49 (Coloma Road) &amp; Northside Drive</b>				
	Westbound Left/Right	TW SC	40	50	100
	Northbound Thru/Right		0	0	100
	Southbound Left		15	20	150
<b>2</b>	<b>Highway 49 (Coloma Road) &amp; Retail Driveway/Project Driveway</b>				
	Eastbound Left/Right	TWSC	50	55	75
	Northbound Left		15	40	100
	Southbound Thru/Right		0	15	145
<b>3</b>	<b>Highway 49 (Coloma Road) &amp; Shopping Center Driveway/Highway 193 (Georgetown)</b>				
	Eastbound Left/Thru/Right	AWSC	30	40	140
	Westbound Left/Thru		45	40	540
	Westbound Right		80	60	90
	Northbound Left		40	30	150
	Northbound Thru		75	70	650
	Northbound Right		40	45	110
	Southbound Left		55	120	200
	Southbound Thru		55	65	340
	Southbound Right		15	10	200
<b>4</b>	<b>Ellinghouse Drive &amp; Highway 193 (Georgetown Road)</b>				
	Eastbound Right	TWSC	0	10	175
	Westbound Left		20	40	220
	Northbound Left/Right		50	70	155

Note: **Red** text indicates queues that exceed available storage

## 8.4 Roadway Segment LOS

**Table 8.3** identifies the existing roadway segment LOS in the project study area along SR 49 and SR 193. As shown, roadway segments on SR 49 (north and south of SR 193) and SR 193 (east of SR 49) would be operating at LOS D or better during the AM and PM peak hour under Near-Term (No Project) Conditions (worst case volumes shown).

**TABLE 8.3 NEAR-TERM YEAR 2032 (NO PROJECT) ROADWAY SEGMENT LOS**

Code	Functional Class Codes (Updated to HCM 2010)	HCM 2010 Planning Level Volumes				
		A	B	C	D	E
<b>2A</b>	<b>Two-Lane Arterial</b>	---	---	850	1,540	1,650
	State Route 49 north of State Route 193				958	
	State Route 49 south of State Route 193			488		
	State Route 193 east of State Route 49			746		

Freeway LOS based on HCM 2010, Exhibit 10-8, Urban Area, Rolling Terrain, K-factor on 0.09, and D-factor of 0.60  
 2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, .09 K-factor and D-factor of 0.6  
 Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed of 45 mi/h  
 Volumes are for both directions unless noted

## 8.5 Signal Warrants

Based on the CA MUTCD peak hour signal warrant criteria (Warrant #3), the SR 49/SR 193/Shopping Center intersection was evaluated for Near-Term (No Project) Conditions. The SR 49/SR 193/Shopping Center intersection would continue to qualify for signalization under the peak hour warrant (the warrant graphs are provided in **Attachment B**). The remaining three study intersections would not qualify for signalization with existing volumes due to the minor street volumes being too low for analysis (minimum 75 minor street peak hour vehicles).

## 9. Cumulative Year 2042 (No Project) Conditions

### 9.1 Future Projections

Cumulative (No Project) Conditions refer to the analysis scenario that would exist following approximately twenty years of development in El Dorado County and the surrounding areas but excludes the development of the proposed project. As with Near-Term (No Project) Conditions, the El Dorado County Travel Demand Model (EDCTDM) was used to develop a growth rate based on the growth within El Dorado County and the immediate project study area. Based on future year traffic volumes projections, the existing traffic volumes were grown up by 0.72% per year for 20 years (2022 opening year to 2042 cumulative year) to coincide with 2042 traffic conditions.

Cumulative (No Project) Year 2042 AM and PM peak hour intersection volumes are presented in **Figure 9.1**.

### 9.2 Intersection Operations

**Table 9.1** presents a summary of the intersection operations for the weekday AM and PM peak hour scenarios for the Cumulative (No Project) Conditions. As presented in **Table 9.1**, all four project study intersections along SR 49 and SR 193 would be operating at acceptable conditions (LOS D or better) during the AM and PM peak hour under Cumulative (No Project) Conditions. All *Synchro* results are included in **Attachment B**.

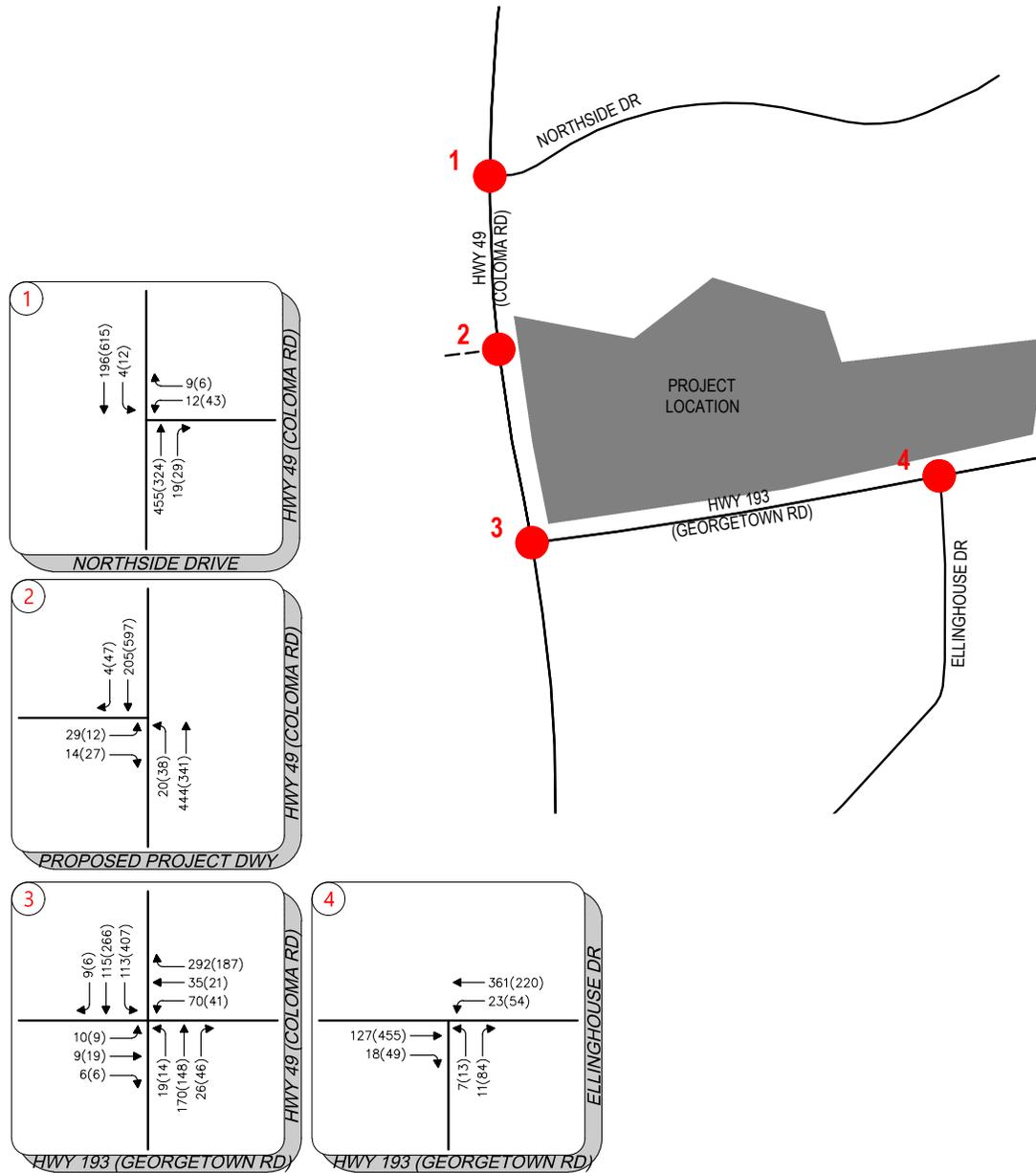
**TABLE 9.1 CUMULATIVE YEAR 2042 (NO PROJECT) INTERSECTION LOS**

ID	Intersection	Peak Hour	Existing			Near Term			Cumulative		
			Control	Delay	LOS	Control	Delay	LOS	Control	Delay	LOS
1	Highway 49 (Coloma Road) & Northside Drive	AM	TWSC	12.0	B	TWSC	12.4	B	TWSC	12.7	B
		PM		14.7	B		14.9	B		16.2	C
2	Highway 49 (Coloma Road) & Retail Driveway/Project Driveway	AM	TWSC	13.6	B	TWSC	14.4	B	TWSC	15.0	B
		PM		17.1	C		17.5	C		18.8	C
3	Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)	AM	AWSC	10.9	B	AWSC	11.8	B	AWSC	12.3	B
		PM		14.6	B		18.7	C		21.4	C
4	Ellinghouse Drive/Highway 193 (Georgetown Road)	AM	TWSC	10.5	B	TWSC	10.9	B	TWSC	11.0	B
		PM		13.5	B		13.6	B		14.2	B

**BOLD** Indicates LOS of D or worse

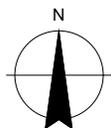
- 1 TWSC = Two-Way-Stop-Control, Vehicle delay based on minor street stopped traffic (worst case).
- 2 AWSC = All-Way-Stop-Control, Vehicle delay based on average delay for each approach (worst case).

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**LEGEND:**

XX - AM PEAK HOUR TRAFFIC VOLUMES  
 (XX) - PM PEAK HOUR TRAFFIC VOLUMES



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**FIGURE 9.1**

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The 95<sup>th</sup> percentile queue lengths were also analyzed using microsimulation (through *Simtraffic* Software) for the study intersection. As shown in **Table 9.2**, all storage lengths are adequate to store the 95<sup>th</sup> percentile vehicle queues at the four study intersections based on SimTraffic microsimulation under Cumulative (No Project) Conditions.

**TABLE 9.2 CUMULATIVE YEAR 2042 (NO PROJECT) QUEUING CHARACTERISTICS**

Int. #	Intersection/Approach	Control Type	Cumulative No Project 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
<b>1</b>	<b>Highway 49 (Coloma Road) &amp; Northside Drive</b>				
	Westbound Left/Right	TW SC	45	60	100
	Northbound Thru/Right		0	10	100
	Southbound Left		15	25	150
<b>2</b>	<b>Highway 49 (Coloma Road) &amp; Retail Driveway/Project Driveway</b>				
	Eastbound Left/Right	TW SC	50	55	75
	Northbound Left		15	35	100
	Southbound Thru/Right		0	0	145
<b>3</b>	<b>Highway 49 (Coloma Road) &amp; Shopping Center Driveway/Highway 193 (Georgetown)</b>				
	Eastbound Left/Thru/Right	AWSC	35	35	140
	Westbound Left/Thru		50	45	540
	Westbound Right		75	60	90
	Northbound Left		40	35	150
	Northbound Thru		80	80	650
	Northbound Right		45	50	110
	Southbound Left		60	145	200
	Southbound Thru		55	75	340
	Southbound Right		15	10	200
<b>4</b>	<b>Ellinghouse Drive &amp; Highway 193 (Georgetown Road)</b>				
	Eastbound Right	TW SC	0	0	175
	Westbound Left		15	40	220
	Northbound Left/Right		45	70	155

Note: **Red** text indicates queues that exceed available storage

### 9.3 Roadway Segment Operations

**Table 9.3** identifies the existing roadway segment LOS in the project study area along SR 49 and SR 193. As shown, roadway segments on SR 49 (north and south of SR 193) and SR 193 (east of SR 49) would be operating at LOS D or better during the AM and PM peak hour under Cumulative (No Project) Conditions (worst case volumes shown).

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**TABLE 9.3 CUMULATIVE YEAR 2042 (NO PROJECT) ROADWAY SEGMENT LOS**

Code	Functional Class Codes (Updated to HCM 2010)	HCM 2010 Planning Level Volumes				
		A	B	C	D	E
<b>2A</b>	<b>Two-Lane Arterial</b>	---	---	<b>850</b>	<b>1,540</b>	<b>1,650</b>
	State Route 49 north of State Route 193				1,010	
	State Route 49 south of State Route 193			515		
	State Route 193 east of State Route 49			786		
<i>Freeway LOS based on HCM 2010, Exhibit 10-8, Urban Area, Rolling Terrain, K-factor on 0.09, and D-factor of 0.60</i> <i>2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, .09 K-factor and D-factor of 0.6</i> <i>Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed of 45 mi/h</i> <i>Volumes are for both directions unless noted</i>						

### 9.4 Signal Warrants

Based on the California Manual on Uniform Traffic Control Devices (CAMUTCD) peak hour signal warrant criteria (Warrant #3) for the SR 49/SR 193 was evaluated for Cumulative (No Project) Conditions. The SR 49/SR 193 intersection would continue to qualify for signalization under the peak hour warrant (the warrant graphs are provided in **Attachment B**). The remaining three study intersections would not qualify for signalization with existing volumes due to minor street volumes being too low (less than 75 minor street vehicles).

## 10. Existing Year 2022 Plus Project Traffic Operations Project Description

The term “project,” as used in this report, refers to the development as follows:

- Development of the existing vacant lot on the northeast quadrant of the State Route 49 (SR 49) and State Route 193 (SR 193) intersection. The proposed developments are as follows:
  - **Main building(s) comprising of 9,787 square feet**
    - Convenience Store - 4,620 square feet
    - QSR Drive-Through Restaurant - 2,585 square feet
    - Future Retail Pad – 2,582 square feet
  - **Fueling facility with island and canopy and car wash of 4,916 square feet**
    - Above ground fueling tanks (2-20,000-gallon tanks)
    - 6-pump (12 vehicle fueling positions) fuel facility/canopy – 3,024 square feet
    - Automated Car Wash – 1,892 square feet

## 10.1 Project Trip Generation

Project site trip generation has been estimated for the proposed Convenience Store with Gas Station, Fast-Food (Quick Service) Restaurant with Drive-Through, and Retail Plaza (Strip) uses based on the combination of vehicle fueling positions (VFP)/square feet and overall square footage of the restaurant and strip retail plaza uses. It is noted that the proposed Car Wash uses are included in the overall trip generation for Convenience Store-Gas Station uses and is often ancillary to these uses based on ITE research. Daily and peak hour project trip generation was calculated by utilizing the Institute of Transportation Engineers (ITE) Publication *Trip Generation Manual (11<sup>th</sup> Edition)* trip rates for Convenience Store with Gasoline Station (land use code #945), Fast-Food Restaurant with Drive-Through (land use code #934), and Strip Retail Plaza (<40k) (land use code #822). The number of trips were estimated for daily and AM and PM peak hours of adjacent street traffic.

Since this type of project would serve traffic already using local roadways (SR 49 & SR 193), a pass-by reduction of trips can be considered. The pass by reduction is calculated based on ITE Publication *Trip Generation Handbook (3<sup>rd</sup> Edition, September 2017)*. A brief description of pass-by trips from the *ITE Trip Generation Handbook* are as follows.

*A pass-by trip is made as an intermediate trip on the way from an origin to a primary trip destination without route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offer direct access to the generator. Pass-by trips are not diverted from another roadway not adjacent to the site.*

According to average pass-by trip percentages from ITE Trip Generation Handbook (3<sup>rd</sup> Edition), convenience market with gasoline service station uses would see a reduction of 62% during the AM peak hour and 56% during the PM peak hour. This coincides with the typical need or ability to get gasoline or items from the convenience on the way to/from your destination (pass-by trips rather than new trips). Similarly, the fast-food drive-through and retail development would see a reduction of 49% during the AM peak hour and 50% during the PM peak hour.

In addition to pass-by trips, the proposed project would also provide complimentary uses such that trips between proposed project facilities can be made on-site. Referred to as "internal" trips, internal trips do not use the street system. As an example, a motorist might be getting gas for their vehicle and decide to pick up a sandwich at the fast-casual restaurant or vice-versa. It is noted that trip generation rates for gasoline service station with convenience market likely reflect internal inter-action amongst the uses. However, the proposed restaurants would attract a small portion of internal trips between uses. Based on the *Transportation Research Board (TRB) National Cooperative Highway Research Program (NCHRP) 684, Enhancing Internal Trip Capture Estimation for Mixed-Use Development (2011)*; it is estimated that a portion of the project trip generation would reflect an internal capture. During the AM peak hour there would be a 12% reduction from internal trips. During the PM peak hour, there would be a 21% reduction due to complimentary uses.

**Table 10.1** presents the project trip generation for both the daily and the AM/PM peak hours. As shown in Table 8.1, the proposed project is expected to generate 4,442 new daily trips. The net external project trip generation is 334 trips for the AM peak hour (170 in, 164 out) and 298 trips for the PM peak hour (151 in, 147 out) after accounting for internal trip reduction. Applying pass-by trip ratios, the proposed project would be expected to generate 112 AM peak hour trips (57 in, 55 out) and 105 PM peak hour trips (53 in, 52 out). Please note, pass-by trips are not discounted at proposed project driveways on SR 49 and SR 193.

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**TABLE 10.1 PROJECT TRIP GENERATION**

Land Use Category (ITE Code)	Unit <sup>1</sup>	Daily Trip Rate/Unit <sup>2</sup>	AM Peak Hour Trip Rate/Unit			PM Peak Hour Trip Rate/Unit		
			Total	In %	Out %	Total	In %	Out %
Fast-Food Restaurant with Drive-Through Window (934)	KSF	467.48	44.61	51%	49%	33.03	52%	48%
Convenience Store with Gasoline Station (945) <sup>4</sup>	KSF	700.43	56.52	50%	50%	54.52	50%	50%
Future Lot (822)	KSF	54.45	2.36	60%	40%	6.59	50%	50%
Description	Quantity (Units)	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			Total	In	Out	Total	In	Out
<b>Project Trips</b>								
Drive-Thru Quick Service Restaurant	2.58	1,206	115	59	56	85	44	41
Convenience Store with Gasoline Station <sup>5</sup>	4.62	3,236	261	131	130	252	126	126
Strip Retail Plaza (<40k)	2.58	140	6	4	2	17	9	8
<b>Total Project Trips</b>		<b>4,442</b>	<b>382</b>	<b>194</b>	<b>188</b>	<b>354</b>	<b>179</b>	<b>175</b>
<b>Internal Capture Reduction</b>								
AM Peak Hour	13%		48	24	24	-	-	-
PM Peak Hour	16%		-	-	-	56	28	28
<b>Total Internal Capture Reduction</b>			<b>48</b>	<b>24</b>	<b>24</b>	<b>56</b>	<b>28</b>	<b>28</b>
<b>Net External Project Trips</b>			<b>4,442</b>	<b>334</b>	<b>170</b>	<b>164</b>	<b>298</b>	<b>151</b>
<b>Pass-By Trip Reduction</b>								
Drive-Thru Quick Service Restaurant			56	29	27	43	22	21
Convenience Store with Gasoline Station			162	81	81	141	71	71
Strip Retail Plaza (<40k)			4	2	1	10	5	4
<b>Total Pass-By Trip Reduction</b>			<b>222</b>	<b>113</b>	<b>109</b>	<b>193</b>	<b>98</b>	<b>96</b>
<b>Net New Project Trips</b>			<b>4,442</b>	<b>112</b>	<b>57</b>	<b>55</b>	<b>105</b>	<b>52</b>

Notes:

1. KSF = 1,000 square feet, VFP = vehicle fueling positions
2. Trip rates based on ITE Trip Generation Manual 11th edition average rates
3. Internal Capture and Pass-By Trip Reductions based on ITE Trip Generation Handbook, 3rd Edition (2017)
4. Using Land Use Subcategory 'VFP (9-15)'
5. Car wash is included with the gas station and convenience store trips

## 10.2 Project Trip Distribution and Assignment

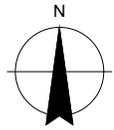
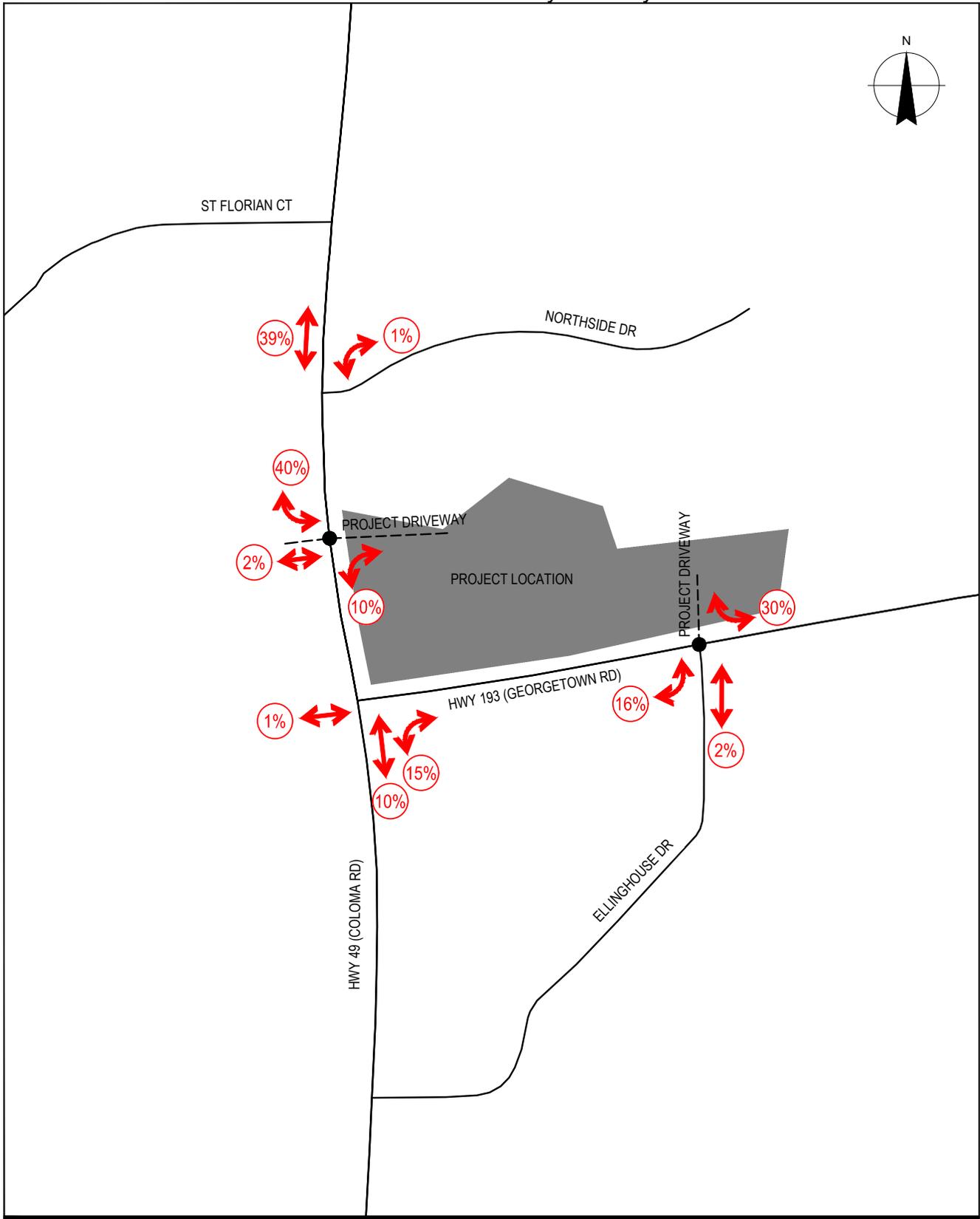
Project trip distribution patterns were estimated based on the current El Dorado County Travel Demand Model, geographical location of the development site, existing traffic flow adjacent to the site, and previous development studies. The proposed trip distribution is presented in **Figure 10.1** with the AM and PM peak hour trip assignment presented in **Figure 10.2**. Trip distribution percentages reflect the primary flow of traffic past the project site on SR 49 and SR 193, existing adjacent commercial-use traffic patterns, and engineering judgement.

During the AM and PM peak hours, 39% of the project trips would be to/from the north on SR 49 and 25% to/from the south on the same highway (south of SR 193). 30% of the project trips would be to/from the east via SR 193. The remaining 6% of the proposed project trips would be from the adjacent commercial centers located both south and west of the proposed project site.

Existing Plus Project Conditions were simulated by superimposing traffic generated by the proposed project onto existing intersection traffic volumes. Existing Plus Project scenario refers to the analysis scenario in which traffic impacts associated with the proposed project are investigated in comparison to the Existing Conditions scenario. Within this scenario, the project generated peak hour traffic volumes have been added to the Existing Conditions volumes to obtain the Existing Plus Project volumes.

**Figure 10.3** presents the traffic volumes for the Existing Plus Project Conditions.

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LEGEND:

(X%) TRIP DISTRIBUTION PERCENTAGE

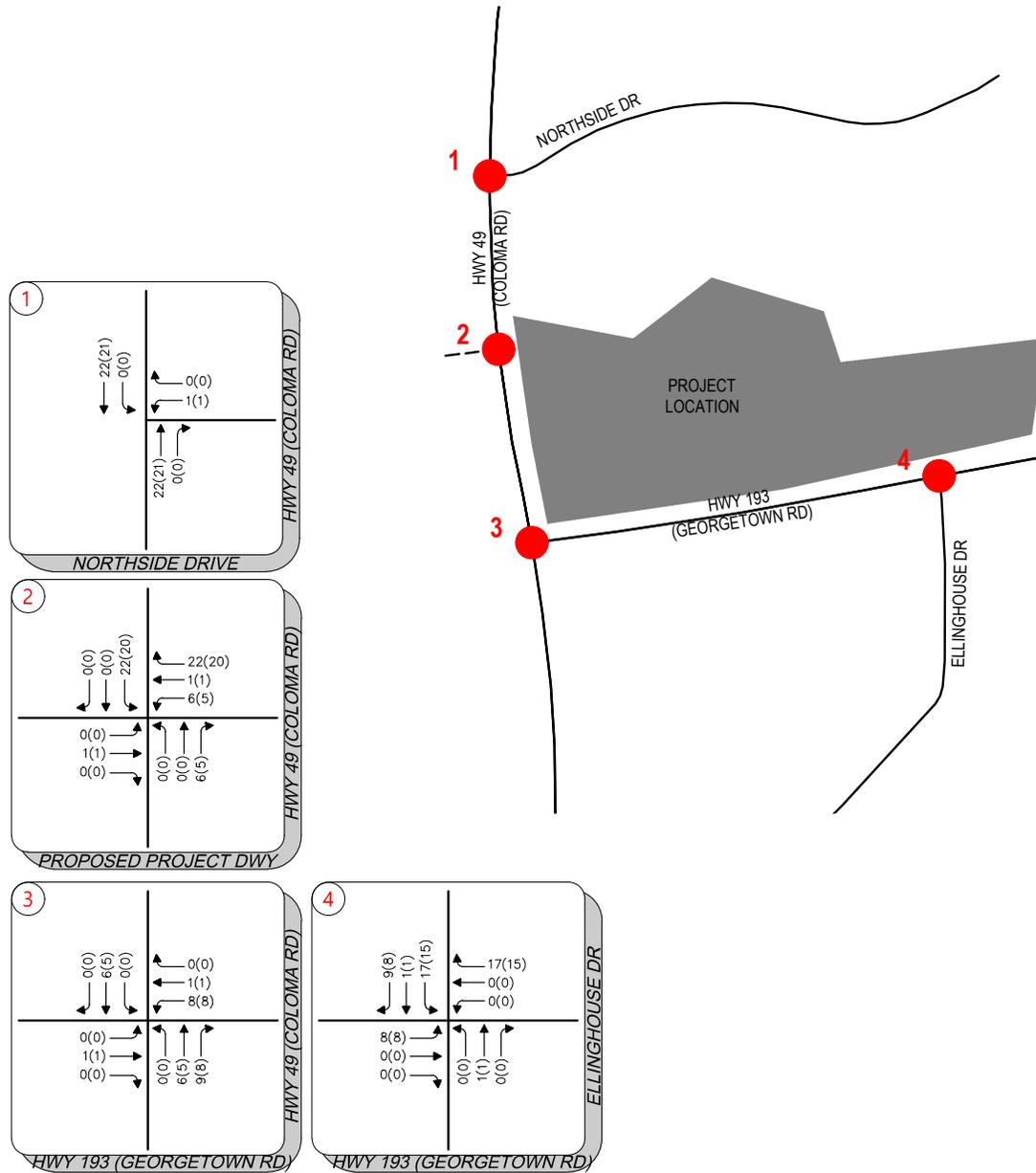


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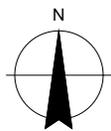
FIGURE 10.1

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**LEGEND:**

XX - AM PEAK HOUR TRAFFIC VOLUMES  
 (XX) - PM PEAK HOUR TRAFFIC VOLUMES

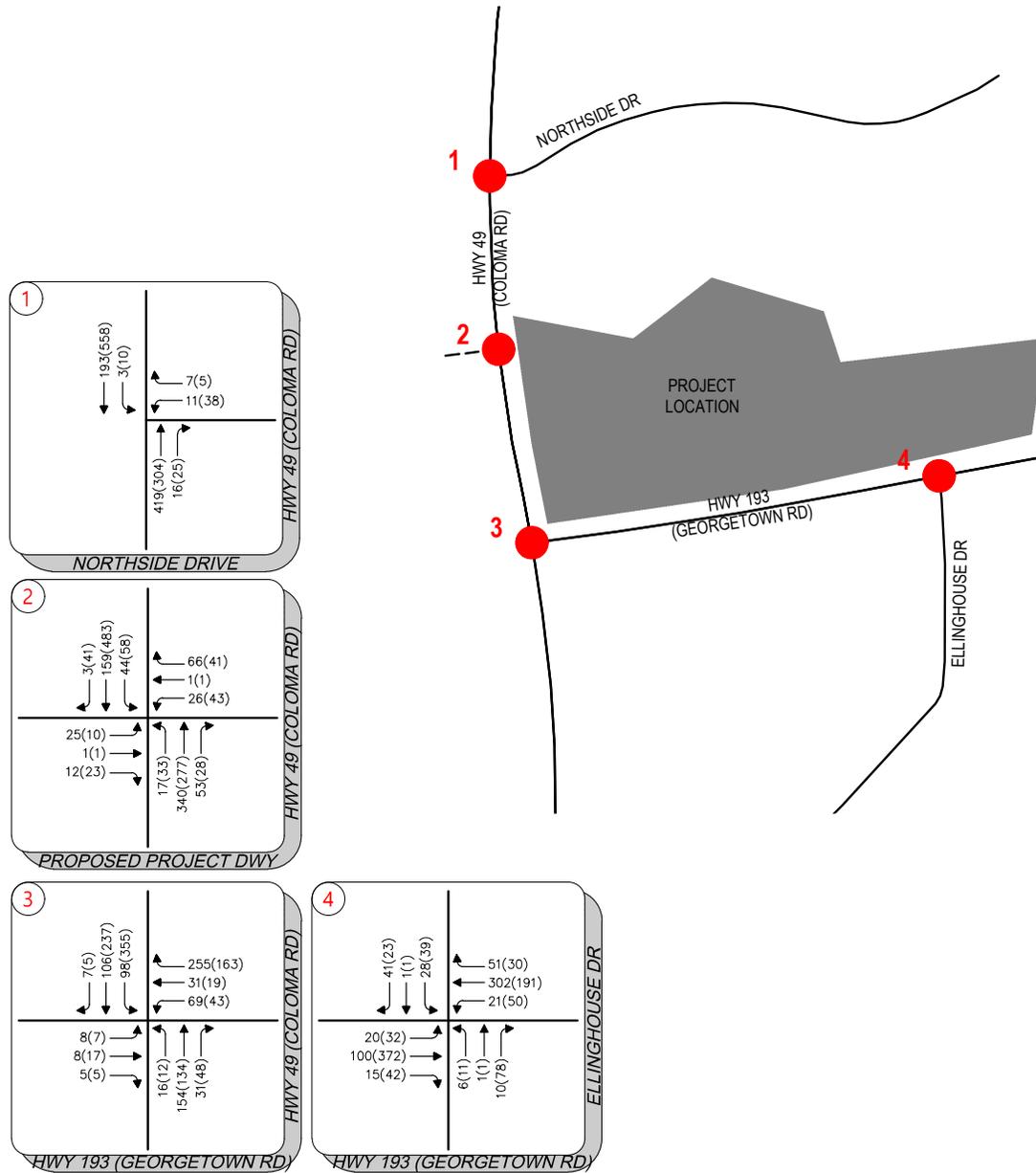


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 TRAFFIC IMPACT ANALYSIS MEMORANDUM  
 NET NEW PROJECT TRIPS

Project No. 12579129  
 Date 8/29/2023

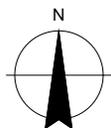
**FIGURE 10.2**

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**LEGEND:**

XX - AM PEAK HOUR TRAFFIC VOLUMES  
 (XX) - PM PEAK HOUR TRAFFIC VOLUMES



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**FIGURE 10.3**

### 10.3 Project Access

Primary access to/from the site would be gained from two full-access driveways on SR 49 and SR 193 (see Updated Project Site Plan, **Figure 2.1**). Based on comments received from both the Count of El Dorado and Caltrans, the proposed project site plan was updated to create improved driveway access and internal circulation. As noted, at SR 49 a widened 45-foot full-access driveway would serve the project site and be located approximately 400-feet north of SR 193 (Georgetown Road). A second 35-foot full-access driveway would be located on SR 193 directly opposite Ellinghouse Drive approximately 600-feet east of SR 49. This project driveway would form a standard four-way intersection (southbound leg) with the SR 93/Ellinghouse Drive intersection. By necessity, the proposed project driveway on SR 193 would cross over the existing Class I pedestrian/bicycle shared use path that parallels the highway on its north side. Please refer to Section 13 (Site Access & Design Parameters) for additional information/discussion.

### 10.4 Intersection Operations/Queuing

**Table 10.2** presents a summary of the intersection operations for the weekday AM and PM peak hour scenarios for the Existing Plus Project Conditions.

**TABLE 10.2 – EXISTING PLUS PROJECT INTERSECTION LOS**

ID	Intersection	Peak Hour	Existing Plus Project			Near Term Plus Project			Cumulative Plus Project			Cumulative Plus Project Plus Mitigation		
			Control	Delay	LOS	Control	Delay	LOS	Control	Delay	LOS	Control	Delay	LOS
1	Highway 49 (Coloma Road) & Northside Drive	AM	TWSC	12.3	B	TWSC	12.7	B	TWSC	13.1	B	TWSC	13.1	B
		PM		15.2	C		15.3	C		16.2	C		16.2	C
2	Highway 49 (Coloma Road) & Retail Driveway/Project Driveway	AM	TWSC	16.5	C	TWSC	18.1	C	TWSC	19.7	C	TWSC	19.5	C
		PM		24.9	C		26.5	D		31.7	D		22.7	C
3	Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)	AM	AWSC	11.0	B	AWSC	12.0	B	AWSC	12.7	B	AWSC	12.7	B
		PM		14.8	B		19.3	C		23.7	C		23.7	C
4	Ellinghouse Drive/Highway 193 (Georgetown Road)	AM	TWSC	12.4	B	TWSC	13.4	B	TWSC	14.0	B	TWSC	13.1	B
		PM		22.2	C		22.8	C		26.2	D		24.3	C

**BOLD** indicates LOS of E or worse

- 1 TWSC = Tw o-Way-Stop-Control, Vehicle delay based on minor street stopped traffic (w orst case).
- 2 AWSC = All-Way-Stop-Control, Vehicle delay based on average delay for each approach (w orst case).

As presented in **Table 10.2**, all four project study intersections would continue to operate at acceptable levels (LOS D or better) during the AM and PM hour with proposed project traffic added to existing volumes. All *Synchro* results are included in **Attachment C**.

Similar to the existing plus project scenario the 95<sup>th</sup> percentile queue lengths were also analyzed using microsimulation (through *SimTraffic* Software) for the study intersection (see **Attachment D**).

As shown in **Table 10.3**, all storage lengths are adequate to store the 95<sup>th</sup> percentile vehicle queues at the four study intersections based on *SimTraffic* microsimulation under Existing plus Project Conditions.

### 10.5 Roadway Segment LOS

**Table 10.4** identifies the existing roadway segment LOS in the project study area along SR 49 and SR 193. As shown, roadway segments on SR 49 (north and south of SR 193) and SR 193 (east of SR 49) would be operating at LOS D or better during the AM and PM peak hour under Existing plus Project Conditions (worst case volumes shown).

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**TABLE 10.3 EXISTING PLUS PROJECT; VEHICLE QUEUING ANALYSIS**

Int. #	Intersection/Approach	Control Type	Existing Plus Project 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
<b>1</b>	<b>Highway 49 (Coloma Road) &amp; Northside Drive</b>				
	Westbound Left/Right	TW SC	50	55	100
	Northbound Thru/Right		0	5	100
	Southbound Left		10	15	150
<b>2</b>	<b>Highway 49 (Coloma Road) &amp; Retail Driveway/Project Driveway</b>				
	Eastbound Left/Thru/Right	TWSC	50	50	75
	Westbound Left/Thru		35	40	200
	Westbound Right		35	30	200
	Northbound Left		15	35	100
	Southbound Left		40	40	145
	Southbound Thru/Right		5	5	145
<b>3</b>	<b>Highway 49 (Coloma Road) &amp; Shopping Center Driveway/Highway 193 (Georgetown)</b>				
	Eastbound Left/Thru/Right	AWSC	30	35	140
	Westbound Left/Thru		50	45	540
	Westbound Right		70	55	90
	Northbound Left		40	30	150
	Northbound Thru		75	65	650
	Northbound Right		45	50	110
	Southbound Left		65	120	200
	Southbound Thru		55	65	340
	Southbound Right		15	10	200
<b>4</b>	<b>Ellinghouse Drive &amp; Highway 193 (Georgetown Road)</b>				
	Eastbound Left/Thru	TWSC	25	25	175
	Eastbound Right		0	0	175
	Westbound Left		15	35	220
	Westbound Thru/Right		0	0	220
	Northbound Left/Right		40	75	155
	Southbound Left/Thru/Right		65	70	80

Note: **Red** text indicates queues that exceed available storage

**TABLE 10.4 EXISTING PLUS PROJECT; ROADWAY SEGMENT LOS**

Code	Functional Class Codes (Updated to HCM 2010)	HCM 2010 Planning Level Volumes				
		A	B	C	D	E
<b>2A</b>	<b>Two-Lane Arterial</b>	---	---	850	1,540	1,650
	State Route 49 north of State Route 193				901	
	State Route 49 south of State Route 193			479		
	State Route 193 east of State Route 49			717		
<p>Freeway LOS based on HCM 2010, Exhibit 10-8, Urban Area, Rolling Terrain, K-factor on 0.09, and D-factor of 0.60</p> <p>2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, .09 K-factor and D-factor of 0.6</p> <p>Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed of 45 mi/h</p> <p>Volumes are for both directions unless noted</p>						

## 10.6 Signal Warrants

Based on the CA MUTCD peak hour signal warrant criteria (Warrant #3), the SR 49/SR 193 intersection would continue to qualify for signalization under the peak hour warrant during the PM peak hour (the warrant graphs are provided in **Attachment B**). The remaining three study intersections would not qualify for signalization with Existing plus Project volumes at this time.

## 11. Near-Term Year 2032 plus Project Conditions

Proposed AM and PM peak hour project trips have been added to Near-Term Year 2032 (No Project) volumes and are shown in **Figure 11.1**.

### 11.1 Intersection Operations/Queuing

**Table 10.2** presents a summary of the intersection operations for the weekday AM and PM peak hour scenarios for the Near-Term Year 2032 Plus Project Conditions.

As presented in **Table 10.2**, all four project study intersections would continue to operate at acceptable levels (LOS D or better) during the AM and PM hour with proposed project traffic added to existing volumes. All *Synchro* results are included in **Attachment C**.

Similar to the existing plus project scenario the 95<sup>th</sup> percentile queue lengths were also analyzed using microsimulation (through *SimTraffic* Software) for the study intersection.

As shown in **Table 11.1**, all storage lengths are adequate to store the 95<sup>th</sup> percentile vehicle queues at the four study intersections based on *SimTraffic* microsimulation under Near-Term plus Project Conditions.

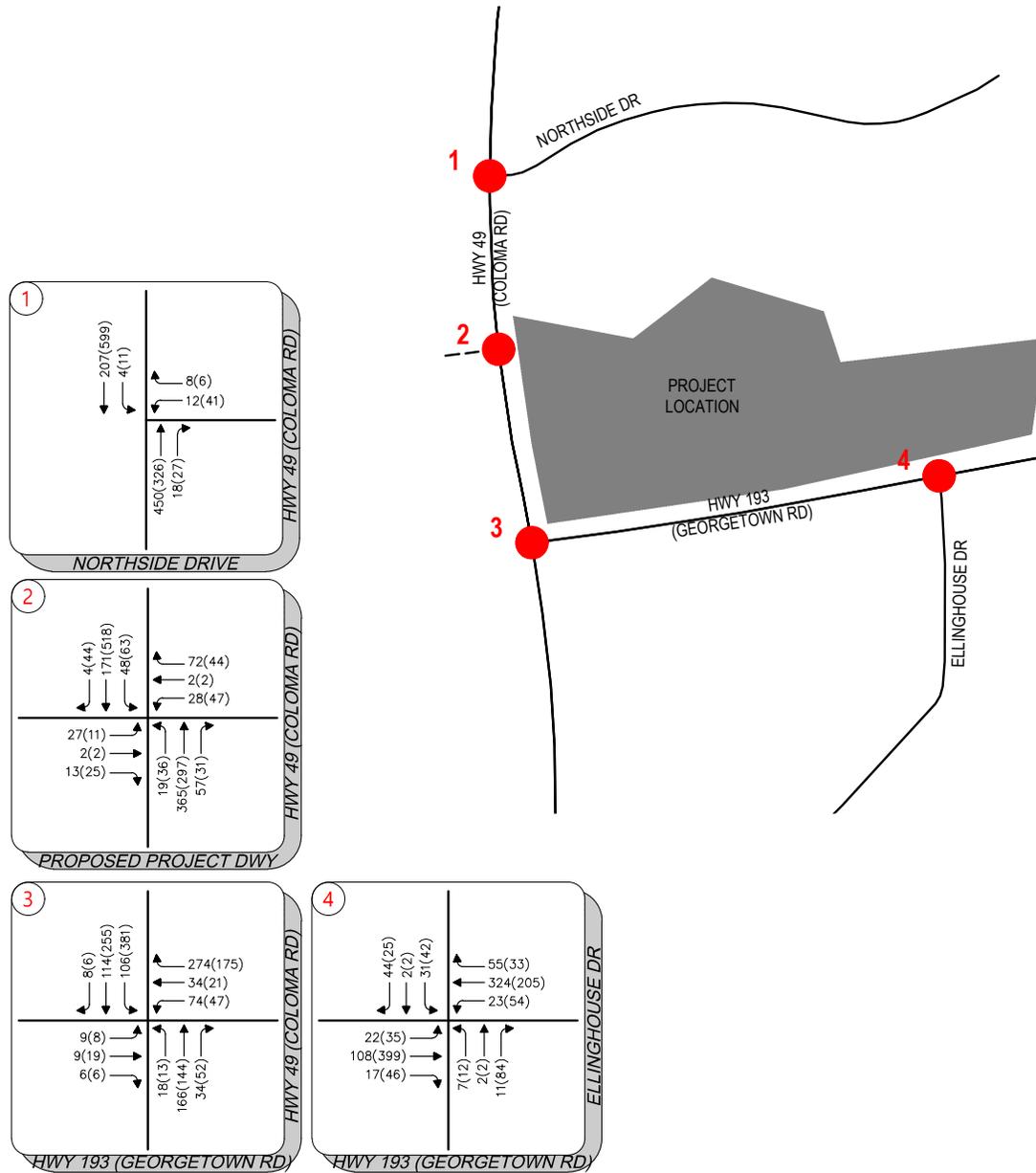
### 11.2 Roadway Segment LOS

**Table 11.2** identifies the existing roadway segment LOS in the project study area along SR 49 and SR 193. As shown, roadway segments on SR 49 (north and south of SR 193) and SR 193 (east of SR 49) would be operating at LOS D or better during the AM and PM peak hour under Near-Term plus Project Conditions (worst case volumes shown).

### 11.3 Signal Warrants

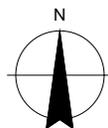
Based on the California Manual on Uniform Traffic Control Devices (CAMUTCD) peak hour signal warrant criteria (Warrant #3), the SR 49/SR 193 intersection would continue to qualify for signalization under the peak hour warrant during the PM peak hour (the warrant graphs are provided in **Attachment B**). The remaining three study intersections would not qualify for signalization with Near-Term Plus Project volumes at this time.

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**LEGEND:**

XX - AM PEAK HOUR TRAFFIC VOLUMES  
 (XX) - PM PEAK HOUR TRAFFIC VOLUMES



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 HOUR VOLUMES

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**FIGURE 11.1**

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**TABLE 11.1 NEAR-TERM PLUS PROJECT; VEHICLE QUEUING CHARACTERISTICS**

Int. #	Intersection/Approach	Control Type	Near Term Plus Project 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
<b>1</b>	<b>Highway 49 (Coloma Road) &amp; Northside Drive</b>				
	Westbound Left/Right	TW SC	40	55	100
	Northbound Thru/Right		5	0	100
	Southbound Left		15	20	150
<b>2</b>	<b>Highway 49 (Coloma Road) &amp; Retail Driveway/Project Driveway</b>				
	Eastbound Left/Thru/Right	TWSC	50	55	75
	Westbound Left/Thru		35	45	200
	Westbound Right		35	35	200
	Northbound Left		10	35	100
	Northbound Thru/Right		0	0	100
	Southbound Left		40	40	145
	Southbound Thru/Right		5	5	145
<b>3</b>	<b>Highway 49 (Coloma Road) &amp; Shopping Center Driveway/Highway 193 (Georgetown)</b>				
	Eastbound Left/Thru/Right	AWSC	40	35	140
	Westbound Left/Thru		50	45	540
	Westbound Right		80	65	90
	Northbound Left		40	35	150
	Northbound Thru		80	70	650
	Northbound Right		50	50	110
	Southbound Left		60	125	200
	Southbound Thru		65	70	340
	Southbound Right		20	10	200
<b>4</b>	<b>Ellinghouse Drive &amp; Highway 193 (Georgetown Road)</b>				
	Eastbound Left/Thru	TWSC	30	35	175
	Eastbound Right		0	0	175
	Westbound Left		15	15	220
	Westbound Thru/Right		5	0	220
	Northbound Left/Thru/Right		45	75	155
	Southbound Left/Thru/Right		60	55	80

Note: **Red** text indicates queues that exceed available storage

**TABLE 11.2 NEAR-TERM PLUS PROJECT; ROADWAY SEGMENT LOS**

Code	Functional Class Codes (Updated to HCM 2010)	HCM 2010 Planning Level Volumes				
		A	B	C	D	E
<b>2A</b>	<b>Two-Lane Arterial</b>	---	---	<b>850</b>	<b>1,540</b>	<b>1,650</b>
	State Route 49 north of State Route 193				969	
	State Route 49 south of State Route 193			517		
	State Route 193 east of State Route 49			772		

Freeway LOS based on HCM 2010, Exhibit 10-8, Urban Area, Rolling Terrain, K-factor on 0.09, and D-factor of 0.60  
2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, .09 K-factor and D-factor of 0.6  
Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed of 45 mi/h  
Volumes are for both directions unless noted

## 12. Cumulative Year 2042 Plus Project Conditions

Proposed AM and PM peak hour project trips have been added to Cumulative Year 2042 (No Project) volumes and are shown in **Figure 12.1**.

### 12.1 Intersection Operations/Queuing

**Table 10.2** presents a summary of the intersection operations for the weekday AM and PM peak hour scenarios for the Cumulative Year 2042 Plus Project Conditions.

As presented in **Table 10.2**, all four project study intersections would continue to operate at acceptable levels (LOS D or better) during the AM and PM hour. However, the Highway 49/Retail Driveway/Project Driveway intersection's westbound left-turn movement would be operating at LOS F (50.7 seconds of delay) during the PM peak hour. Although the entire westbound project driveway approach would be operating at LOS D, the left-turn movement would experience significant delays. A check of vehicle queuing for the westbound left-turn movement indicates acceptable queues at 40-55' during the peak hours. In addition, all other critical turning movements to/from State Route 49 would be operating at LOS C or better during the PM peak hour. Mitigation has been recommended for the Highway 49/Retail Driveway/Project Driveway intersection to improve overall vehicle delays. All *Synchro* results are included in **Attachment C**.

Similar to the existing plus project scenario the 95<sup>th</sup> percentile queue lengths were also analyzed using microsimulation (through *SimTraffic* Software) for the study intersection.

As shown in **Table 12.1**, all storage lengths are adequate to store the 95<sup>th</sup> percentile vehicle queues at the four study intersections based on *SimTraffic* microsimulation under Cumulative Year 2042 Plus Project Conditions.

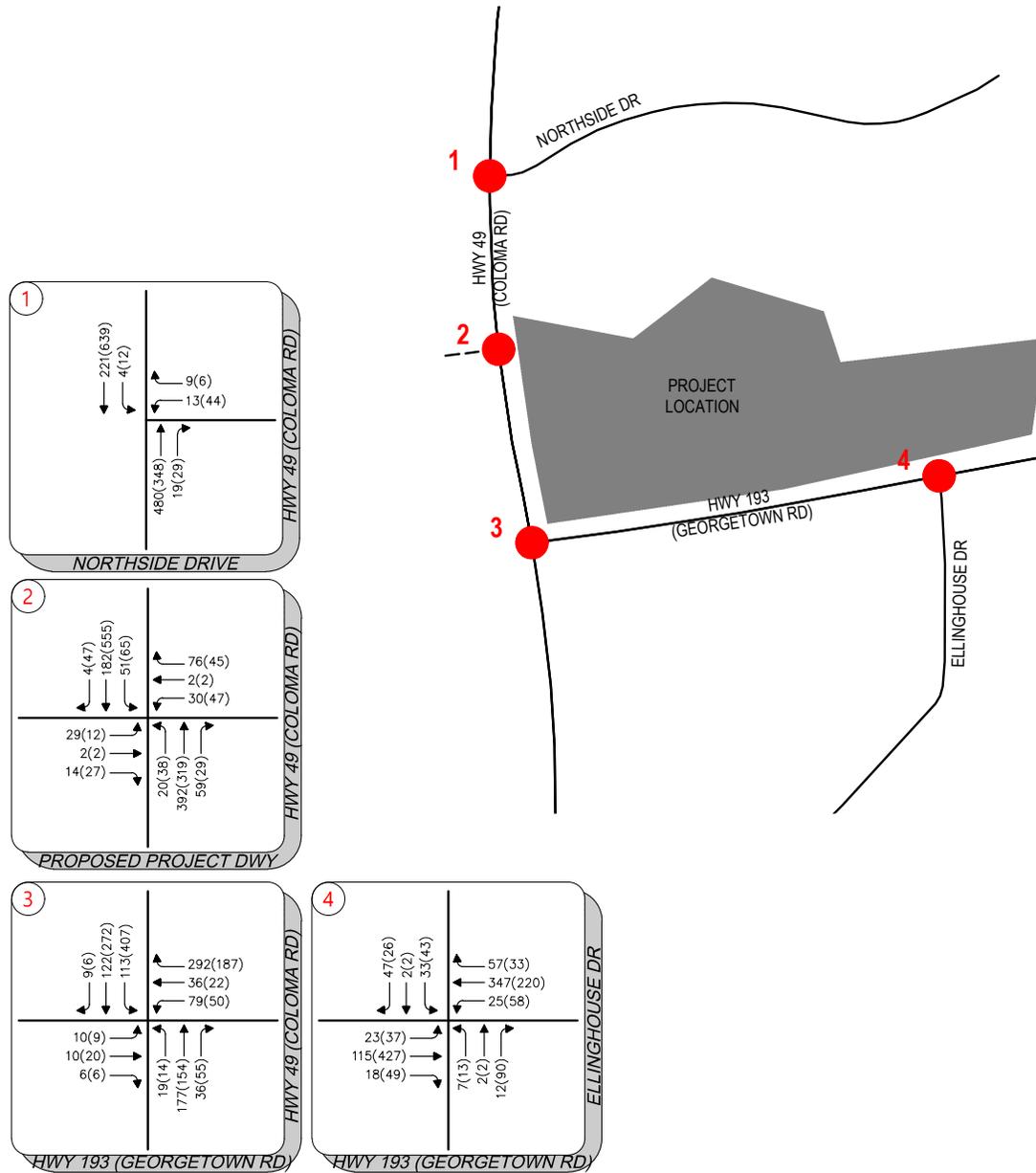
### 12.2 Roadway Segment LOS

**Table 12.2** identifies the existing roadway segment LOS in the project study area along SR 49 and SR 193. As shown, roadway segments on SR 49 (north and south of SR 193) and SR 193 (east of SR 49) would be operating at LOS D or better during the AM and PM peak hour under Cumulative Near-Term plus Project Conditions (worst case volumes shown).

### 12.3 Signal Warrants

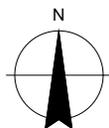
Based on the CA MUTCD peak hour signal warrant criteria (Warrant #3) for all four study intersections were evaluated for Near-Term plus Project Conditions. The SR 49/SR 193 intersection would continue to qualify for signalization under the peak hour warrant during the PM peak hour (the warrant graphs are provided in **Attachment B**). The remaining three study intersections would not qualify for signalization with Cumulative Year 2042 plus Project volumes at this time.

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**LEGEND:**

XX - AM PEAK HOUR TRAFFIC VOLUMES  
 (XX) - PM PEAK HOUR TRAFFIC VOLUMES



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**FIGURE 12.1**

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**TABLE 12.1 CUMULATIVE PLUS PROJECT; VEHICLE QUEUING CHARACTERISTICS**

Int. #	Intersection/Approach	Control Type	Cumulative Plus Project 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
<b>1</b>	<b>Highway 49 (Coloma Road) &amp; Northside Drive</b>				
	Westbound Left/Right	TWSC	55	75	100
	Northbound Thru/Right		5	5	100
	Southbound Left		15	20	150
<b>2</b>	<b>Highway 49 (Coloma Road) &amp; Retail Driveway/Project Driveway</b>				
	Eastbound Left/Thru/Right	TWSC	50	55	75
	Westbound Left/Thru		40	55	200
	Westbound Right		40	35	200
	Northbound Left		15	40	100
	Northbound Thru/Right		10	15	100
	Southbound Left		45	45	145
	Southbound Thru/Right		5	5	145
<b>3</b>	<b>Highway 49 (Coloma Road) &amp; Shopping Center Driveway/Highway 193 (Georgetown)</b>				
	Eastbound Left/Thru/Right	AWSC	40	40	140
	Westbound Left/Thru		50	45	540
	Westbound Right		90	55	90
	Northbound Left		35	35	150
	Northbound Thru		75	75	650
	Northbound Right		50	50	110
	Southbound Left		65	135	200
	Southbound Thru		65	80	340
	Southbound Right		25	15	200
<b>4</b>	<b>Ellinghouse Drive &amp; Highway 193 (Georgetown Road)</b>				
	Eastbound Left/Thru	TWSC	25	25	175
	Eastbound Right		0	10	175
	Westbound Left		15	40	220
	Northbound Left/Thru/Right		45	75	155
	Southbound Left/Thru/Right		60	60	80

Note: **Red** text indicates queues that exceed available storage

**TABLE 12.2 CUMULATIVE PLUS PROJECT; ROADWAY SEGMENT LOS**

Code	Functional Class Codes (Updated to HCM 2010)	HCM 2010 Planning Level Volumes				
		A	B	C	D	E
<b>2A</b>	<b>Two-Lane Arterial</b>	---	---	850	1,540	1,650
	State Route 49 north of State Route 193				1,035	
	State Route 49 south of State Route 193			551		
	State Route 193 east of State Route 49			824		

Freeway LOS based on HCM 2010, Exhibit 10-8, Urban Area, Rolling Terrain, K-factor on 0.09, and D-factor of 0.60

2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, .09 K-factor and D-factor of 0.6

Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed of 45 mi/h

Volumes are for both directions unless noted

## 13. Site Access & Design Parameters

### 13.1 Truck Turning Templates

At the request of Caltrans Engineering staff, both proposed project driveways were evaluated for adequate turning radii to/from the State Highway 49 and 193 based on a design WB-62 (large trucks) as defined in by the American Association of State Highway and Transportation Officials (AASHTO). Using accepted software (*AutoTURN 11.0*), outbound left-turn movements for the large trucks have been evaluated and are shown in **Figure 13.1—Truck Turning Templates**. (In addition, truck templates for other inbound/outbound turning movements are also shown in **Attachment F**). As shown, large trucks would have adequate turning radii from the proposed project driveway located on SR 49 exiting the site. However, large truck movements from the proposed project driveway onto SR 193 would be slightly restricted due to the internal curve radius (on-site) located approximately 80-100 feet from north of SR 193. Due the internal curve radius, large trucks would have to encroach into the opposing driveway lane to enter/exit the site. In response, the following measures have been implemented to correct truck access at the project driveway:

- SR 193/Ellinghouse Drive/Project Driveway: The internal curve radius on the project driveway at SR 193 (located approximately 80-100 feet from SR 193) has been enlarged and straightened to allow acceptable truck access. As shown in the conceptual driveway plan in **Figure 13.2**, the driveway has been re-aligned to enter the site at a more northerly direction allowing large trucks to ingress/egress acceptably without affecting opposing traffic flows.

Large trucks would be able to access the SR 49/Retail Driveway/Project Driveway acceptably based on a lesser grade, wider driveway width, and less curvature. It is noted that the revised project site plan also reflects flared, large radius driveways at both SR 49 and SR 193 for safer turning movements to/from the project site. At SR 49, the project driveway widens from 45-feet to 80-feet at the edge of highway. Similarly, the SR 193 project driveway widens from 35-feet to 120-feet at the edge of highway. These wider-radius project driveways allow safer access to/from the highways and particularly for large truck access.

#### 13.1.1 Large Over-Sized (STAA) Vehicles on State Route 49

The State Route 49 American River Confluence Study has highlighted the issue of oversized vehicles (STAA-trucks) using SR 49 between Cool and Auburn as follows:<sup>6</sup>

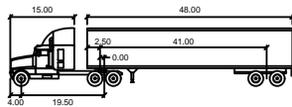
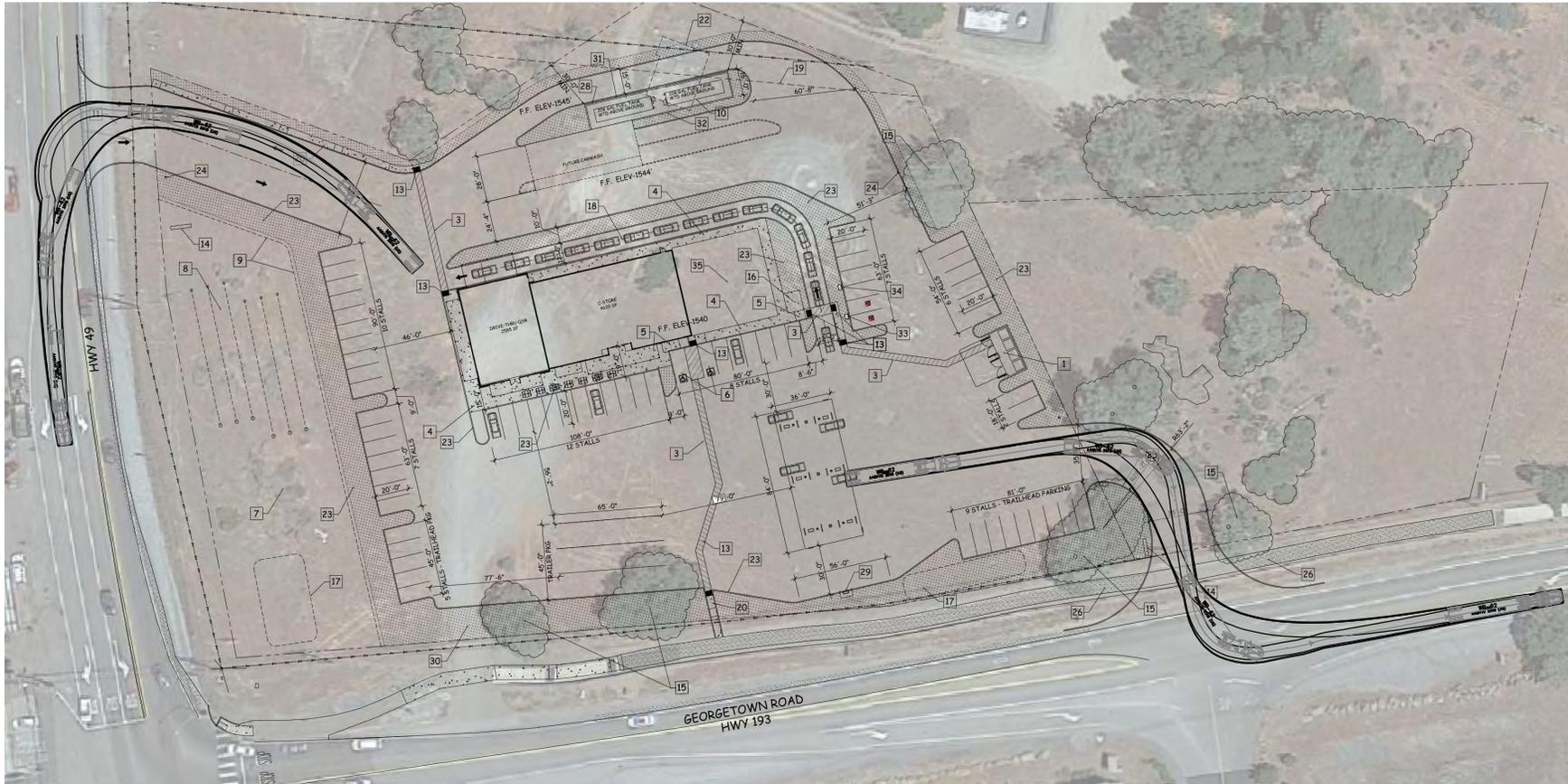
“SR 49 in the study corridor is designated for use by California Legal sized trucks with a kingpin to rear axle length (KPRA) ranging from 30 to 38 feet. However, it is not uncommon to see oversized vehicles (48-53 feet KPRA) using SR 49 in the study corridor (over 30% of trucks using the SR 49 in the study corridor are 5+ axle trucks). The reason that truck length restrictions are applied to SR 49 within the study area is the winding roadway alignment and sharp curves unsuitable for larger trucks creating an unsafe condition. The national truck network that serves interstate truck travel has higher design standards that allow for vehicles with a KPRA up to 53 feet, which is 15 feet longer than allowed on SR 49.”

Due to the winding and narrow nature of the SR 49 segment between Cool and Auburn, the oversized trucks can cross-over the centerline into the opposite travel lane and potentially into oncoming vehicles. Based on discussions with the project applicant, they do not anticipate oversized vehicles (48-53 feet) servicing/delivering to their facility.<sup>7</sup> California legal-sized trucks would serve the facility with largest truck(s) anticipated for fuel delivery to the proposed service station. In addition, the applicant indicates they would recommend alternative routes for large trucks accessing the project site to use SR 49 between Highway 50 and Cool to try and

<sup>6</sup> DKS Associates, State Route (SR) 49 American River Confluence Study, Final Report, Prepared for El Dorado County Transportation Commission, February 2023.

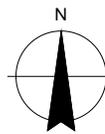
<sup>7</sup> Mr. Melvin Higginbotham, Architect, MHA Design Services, Discussion of truck access to proposed project site and size limitations, Personal communication, April 18, 2024.

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WB-62

feet			
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

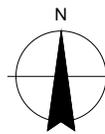
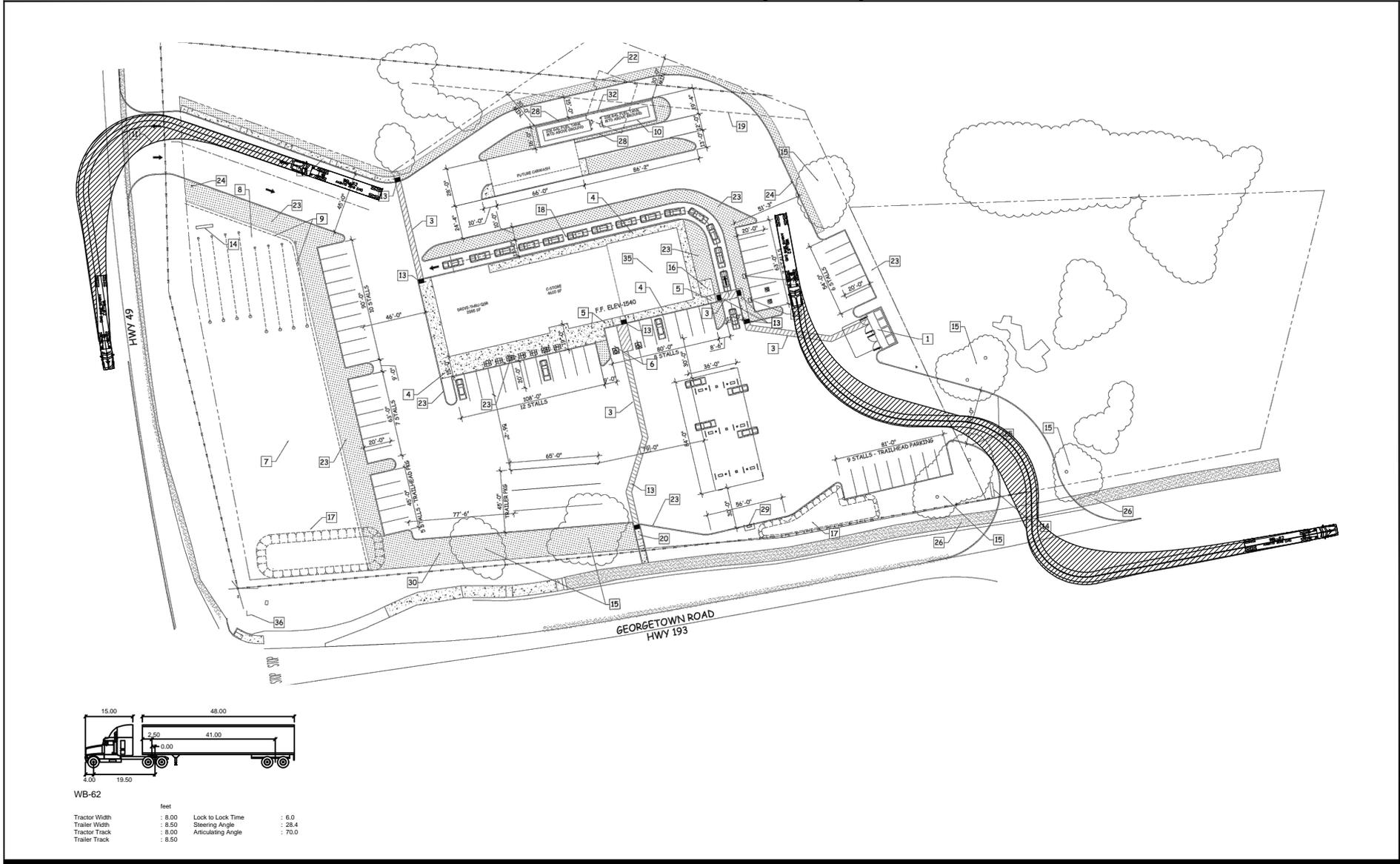


MHA DESIGN SERVICES  
 COOL AUTOMOBILE AND COMMERCIAL CENTER  
 TRAFFIC IMPACT ANALYSIS MEMORANDUM  
 TRUCK TURNING TEMPLATE  
 OUTBOUND LEFT TURN MOVEMENTS

Project No. 12579129  
 Date 8/14/2023

FIGURE 13.1

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study



MHA DESIGN SERVICES  
 COOL AUTOMOBILE AND COMMERCIAL CENTER  
 TRAFFIC IMPACT ANALYSIS MEMORANDUM  
 CONCEPTUAL DRIVEWAY PLAN

Project No. 12579129  
 Date 8/14/2023

FIGURE 13.2

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Automobile - based Commercial Project  
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alleviate additional truck traffic on the SR 49 corridor between Cool and Auburn. One of the recommendations of the SR 49 Confluence Study would be to provide more visible (salient) truck restriction signage at the intersection for SR 49/SR 193 as well as on SR 49 north of the intersection. In response to trucks using SR 49 to access the proposed project site, the following measures recommend:

- California heavy vehicles accessing the proposed project site should be routed on SR 49 between Highway 50 and Cool (to the extent possible). As part of this recommendation, signs should be placed at outbound project driveway points indicating “Large Trucks Prohibited on SR 49 Segment North to Auburn.”

## 13.2 Project Driveway Access/Operations

Primary access to/from the site would be gained from two full-access driveways on SR 49 and SR 193 (see Updated Project Site Plan, (**Figure 2.1**)). As noted, a 45-foot full-access driveway would serve the project site to/from SR 49 and be located approximately 400-feet north of SR 193 (Georgetown Road). A second 35-foot (conceptual 40-foot width) full-access driveway would be located on SR 193 directly opposite Ellinghouse Drive and approximately 600-feet east of SR 49. This project driveway would form a standard four-way intersection (southbound leg) with the SR 93/Ellinghouse Drive intersection. By necessity, the proposed project driveway on SR 193 would cross over the existing Class I pedestrian/bicycle path that parallels the highway on its north side. Based on updated driveway design, both project driveways have enlarged corner radii at both SR 49 and SR 193 for enhanced vehicle and truck access/egress.

With respect to overall project driveway operations, the SR 49/Project Retail-Project Driveway is expected to operate acceptably under all “with project” scenarios relative to intersection LOS and vehicle queuing. However, the following driveway lane geometries are recommended to ensure adequate vehicle/truck access and improve overall vehicle delays:

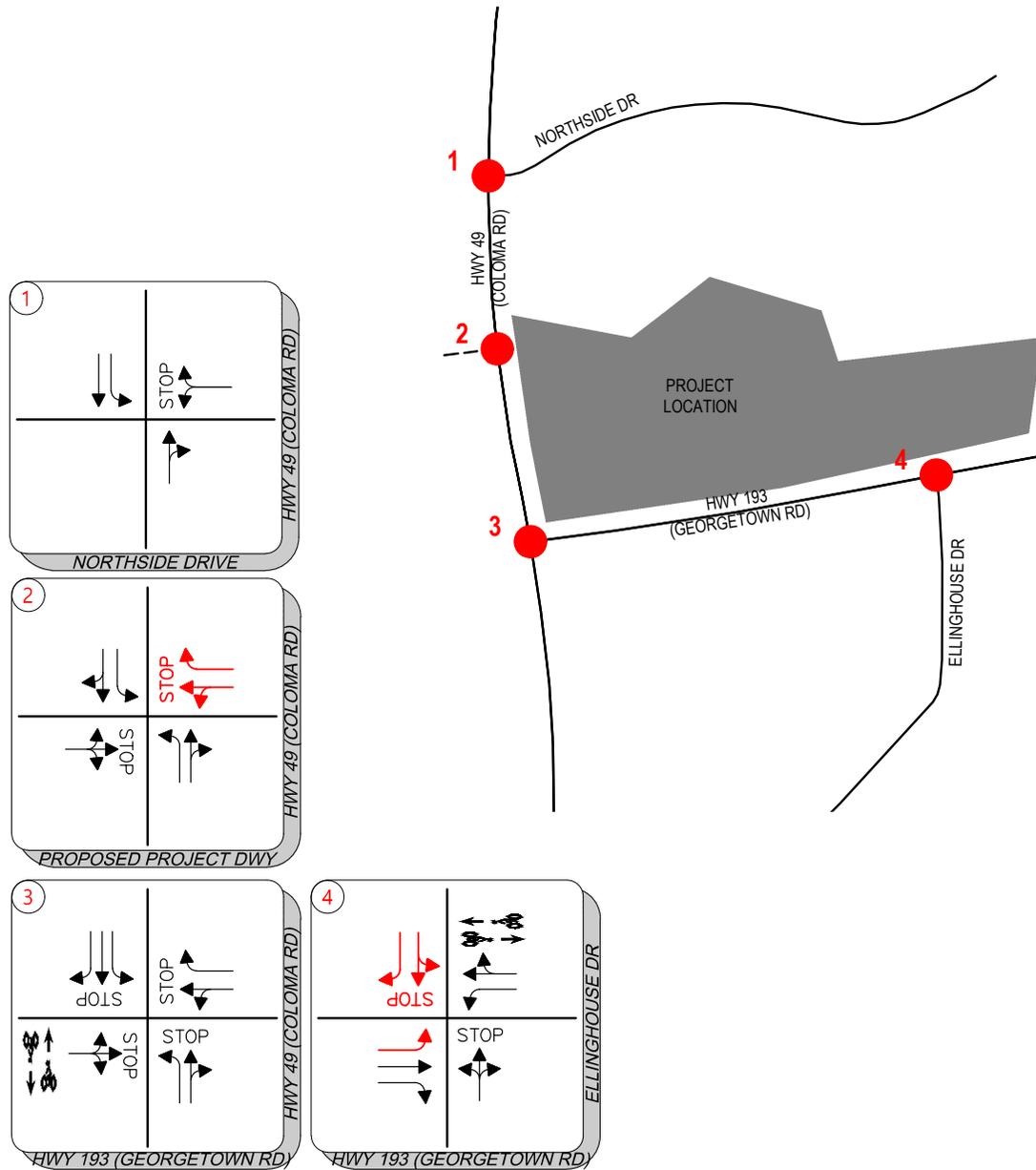
- SR 49/Retail Driveway-Project Driveway: It is recommended that a separate outbound (westbound) left-through and right-turn lanes (14-feet each) be striped with a 17-foot inbound lane (eastbound) to accommodate for efficient ingress/egress.

The SR 193/Ellinghouse Drive/Project Driveway would operate acceptably under Cumulative Year 2042 plus Project Conditions (LOS D or better). However, there would be other operational issues related to vehicle and pedestrian/bicycle safety issues related to the driveway. Specifically, a safety and vehicle sight distance issue would be created due to the lack of a separate westbound left-turn and storage capacity from SR 193 into the project driveway. The lack of a separate westbound turn-lane on SR 193 into the project driveway creates a sight distance problem with motorists in the opposing (existing) westbound left-turn lane into Ellinghouse Drive. Westbound motorists wishing to access the proposed project driveway cannot see around vehicles queued eastbound left turn to through-traffic. In addition, motorists turning into the project driveway must drive across (inbound) an existing east-west Class I pedestrian/bike path (outbound vehicles) creating additional safety hazards. For these reasons, the following circulation improvements are recommended at the intersection:

- SR 193/Ellinghouse Drive/Project Driveway: It is recommended that SR 193 be widened and/or re-striped to accommodate a separate inbound (eastbound) left-turn lane for the proposed project driveway. Based on conceptual design parameters (Caltrans HDM), the left-turn lane should have a storage capacity of 75-feet (3 car lengths) with a bay taper of approximately 290-feet based on vehicle speeds (less than 45 mph) and lane width (11-feet).

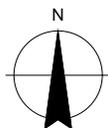
Recommend study intersection lane geometries have been shown in **Figure 13.3**.

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LEGEND:

- BICYCLE LANE
- VEHICLE LANE
- STOP STOP CONTROL
- RECOMMENDED LANE GEOMETRIES



MHA DESIGN SERVICES  
 COOL AUTOMOBILE AND COMMERCIAL CENTER  
 TRAFFIC IMPACT ANALYSIS MEMORANDUM  
**RECOMMENDED STUDY INTERSECTION  
 LANE GEOMETRIES**

Project No. 12579129  
 Date 8/29/2023

**FIGURE 13.3**

### 13.3 Internal Circulation

Patrons would access the project site via State Route 49 and/or State Route 193 at the two project driveways. Internal drive aisles would provide access to both parking and vehicle fueling positions located on the southern portion of the project site. As shown in **Figure 2.1**, the main retail and restaurant buildings would be south-facing with parking areas located directly in front of the buildings. In addition, parking areas would be located primarily along the western, eastern, and limited southern portions of the site. Motorists (and large trucks) would be able to circulate through the site in a circular fashion (if necessary) via a large internal drive extending around the rear of the commercial retail buildings. Patrons using the project driveway inbound (northbound) from SR 193 would cross over the existing Class I pedestrian/bike shared use path and then extend west into the site. To allow for the topography and physical fauna, the driveway would curve west into the site approximately 80-100 feet north of SR 193. Therefore, it is likely that outbound vehicles from the site would queue across the existing Class I pedestrian/bike shared use path. Based on discussions with the project applicant, the existing bike path would be re-aligned to accommodate pedestrians and bicyclists. Recommendations for mitigating the effects of vehicle crossings at the Class I pedestrian/bike path are found in Pedestrian-Bicycle (**Section 13.6**).

### 13.4 Drive-Through Operations

At the request of Caltrans, the quick-service restaurant (QSR) with drive-through has been quantitatively evaluated for drive-through vehicle queuing operations. Please note, at this time it is not known what type of fast-food and/or QSR tenant would be occupying the space. Knowing the specific fast-food/QSR would be useful to focus on the unique characteristics and demand of the drive-through lane. Based on previous vehicle queuing analyses of other fast-food/QSR projects, the drive-through vehicle queues can vary based on the brand of the tenant. For this reason, the drive-through lane demand for the proposed project was assessed based on two high-intensity tenants as a “worst-case” analysis. These included drive-through lane vehicle queue surveys conducted for Starbucks and In-N-Out Burger Restaurants.<sup>8</sup> (See Attachment G. Starbucks and In-N-Out Burger Vehicle Queue Surveys)

Based on the revised project site plan, the fast-food/QSR drive-through lane would have a capacity of approximately 14 vehicles (275-feet @ 20'/vehicle). Vehicles would enter the drive-through lane on the east side of the building complex extending north then west along the rear side of the future retail pad, convenience store, and fast-food/QSR. Vehicles would then exit out of the drive-through lane via the project driveway at Highway 49 and/or circulate south and east to the project driveway at SR 193.

Three drive-through lane vehicle queuing surveys (each) were conducted at three different Starbucks and In-N-Out Burger Restaurants in the Bay Area.<sup>9</sup> Based on the average 95<sup>th</sup> percentile vehicle queue length, Starbucks has an 11-vehicle demand and for In-N-Out Burger Restaurants a 16-vehicle demand for the drive-through lane. Peak drive-through lane demand occurred during the weekday AM peak hour for the Starbucks and both the weekday midday and PM peak hour for In-N-Out Burger. Based on the proposed project's drive-through lane capacity of 14 vehicles, measured vehicle queues for the 95<sup>th</sup> percentile would be exceeded by two (2) vehicles. However, additional vehicles could be accommodated on-site based on available storage in wide internal circulation areas without interfering with other internal traffic flow or either project driveway on SR 49 or SR 193.

### 13.5 Parking

The proposed project would provide 81 total parking spaces made up of 76 standard spaces (9x20'), 2 ADA spaces (9x20'), 1 loading zone space (8x20'), and 2 Level 2 EVC spaces (9'x20'). Based on the County of El Dorado parking code, the proposed project's parking requirements have been calculated based on the use

<sup>8</sup> Omni-Means Engineers and Planners, Survey Summary of In-N-Out Burger & Starbucks Trip Generation, Parking Demand, and Vehicle Queuing, March 29, 2017.

<sup>9</sup> Omni-Means Engineering and Planners, Survey Summary Ibid.....

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overall size (square feet) and/or active use area (AUA). Active use area is defined as “all developed areas within a building except for storage areas, restrooms, and employee lunchroom/cafeteria(s).” Based on parking code requirements for Retail Sales and Services, Shopping Center, Restaurants (with drive-through), and Office uses the proposed project’s required parking demand would be as follows:

Convenience Store (4,620 sf.—2,400 sf. AUA & 2,220 sf. storage & 2 check stands)

Retail Food & Beverage :	1 space per 200 sf. of AUA, plus 1 space per check stand, plus 1 space per 600 sf. of storage	
	2,400 sf. AUA / 200 sf.	= 12 spaces
	2,220 sf. storage / 600 sf.	= 4 spaces
	2 check stands x 1 space	= 2 spaces
	<b>Subtotal</b>	<b>= 18 spaces</b>

Restaurant with Drive-Through (2,500 sf.)

	1 space per 300 sf. of GFA,; plus 1 RV space for every 20 parking spaces	
	<b>2,525 sf. GFA / 300 sf.</b>	<b>= 9 spaces</b>

Future Retail Pad (2,582. – 625 sf. AUA)

	1 space per 300 sf. of Neighborhood Shopping Center (<15k)	
	<b>2,582 sf. NSC / 300 sf.</b>	<b>= 9 spaces</b>

**Total Required Parking Spaces: =36 spaces**

As calculated above, the proposed project is required to provide 36 parking spaces based on County Code requirements. The proposed parking supply of 81 spaces would provide a surplus of 45 spaces. In addition, the proposed project would provide fourteen (14) supplemental parking stalls for trail parking as part of the 81-space supply. These parking stalls could be used for the adjacent Class I pedestrian/bike shared use path and/or patrons of the Olmsted Loop Trail trailhead located on the west side of SR 49 just north of the proposed project site off Saint Florian Court. Finally, the proposed project would also provide bicycle parking spaces based on the County’s code requirement of 1 bicycle parking space for every 5 required parking spaces. This would equate to eight (8) bicycle parking spaces located adjacent to the Class I pedestrian/bicycle path along the southern frontage of the project. As noted, bicycle racks will be designed to enable a bicycle to be locked and installed in a manner for convenient access.

### 13.6 Pedestrian and Bicycle Access

Pedestrian and bicycle access to the proposed project is currently limited to existing pedestrian crossings at the SR 49/SR 193 intersection and the Class I pedestrian/bicycle path located along the SR 193 (north side) and SR 49 (west side, south of SR 193). As part of proposed project development, a Class II bike lane along the project site’s western frontage would extend north from SR 193 along SR 49 to provide additional access and safety to complement the existing Class I pedestrian/bicycle path.

At the request of Caltrans, further information related to the re-construction of the existing Class I pedestrian/bicycle and overall sight distance for eastbound bicyclists has been addressed. Currently, the proposed placement of the project driveway to/from SR 193 situates it across the existing Class I pedestrian/bike path as shown in **Figure 2.1**. There is a concern that the existing earthen hill (grade) will block motorist’s sight distance as they exit the driveway and will not be able to see bicyclists approaching from the east. Based on a review of the revised project site plan and Civil engineering design, a new retaining wall would be constructed along the project site’s southern frontage extending from the west side of the project’s driveway at SR 193 towards SR 49. The retaining wall’s height would only be 1-foot tall at its highest point. Based on this low height, bicyclists will have a clear view of all vehicles entering/exiting the driveway and vice-versa. In addition, the retaining wall on the east side of the frontage paralleling the Class I pedestrian/bicycle

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Automobile - based Commercial Project  
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trail would be 4-feet tall at its highest point. Again, this four-foot height would still provide adequate sight distance for both bicyclists and motorists where the path crosses the proposed project driveway along SR 193.

As noted, the proposed project driveway to/from SR 193 opposite Ellinghouse Drive would cross over the existing Class I pedestrian/bicycle path that extends in an east-west direction along the north side of SR 193 approximately 20-feet from the highway. Again, this existing Class I pedestrian/bicycle facility would be re-designed at the driveway crossing (further north) to ensure safe access and prevent vehicle conflicts. As part of the proposed Class I pedestrian/path re-design, the following measure are recommended and shown in **Figure 13.4**:

- SR 193/Ellinghouse Drive/Project Driveway: It is recommended that where the proposed project driveway crosses the Class I pedestrian/bicycle path on the north side of SR 193 install green conflict zone markings. In addition, there should be warning signage for trail users (DRIVEWAY AHEAD) and warning signage for motorists (TRAIL XING W11-15 & W11-15P). Consideration should be given to the installation of yield pavement markings “shark teeth” for north-south driveway approaches prior to crossing the trail.

Transportation mitigation measures for Existing Plus Project conditions for project study intersections and pedestrian-bicycle safety have been recommended in **Section 15 (Mitigation and Summary)**.

## 14. Quantitative Vehicle Miles Traveled (VMT)

### 14.1 State VMT Guidance

SB-743, which went into effect state-wide in July 2020, established a new framework for assessing transportation impacts under CEQA. Vehicular level of service (LOS), which had previously been the primary metric for assessing transportation impacts, could no longer be used for CEQA impacts (though it could be used for other things). In its place, vehicle miles travelled would be the main framework for assessing transportation impacts.

CEQA gives lead agencies broad discretion over analytical methodologies. CEQA Guidelines §15064.3(b)(4), which is new with SB-743, reads:

*“Methodology: A lead agency has discretion to choose the most appropriate methodology to evaluate a project’s vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project’s vehicle miles traveled and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.”*

No particular methodology or metric is mandated; the choice is left to the lead agency, as is the choice of threshold.

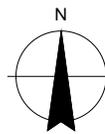
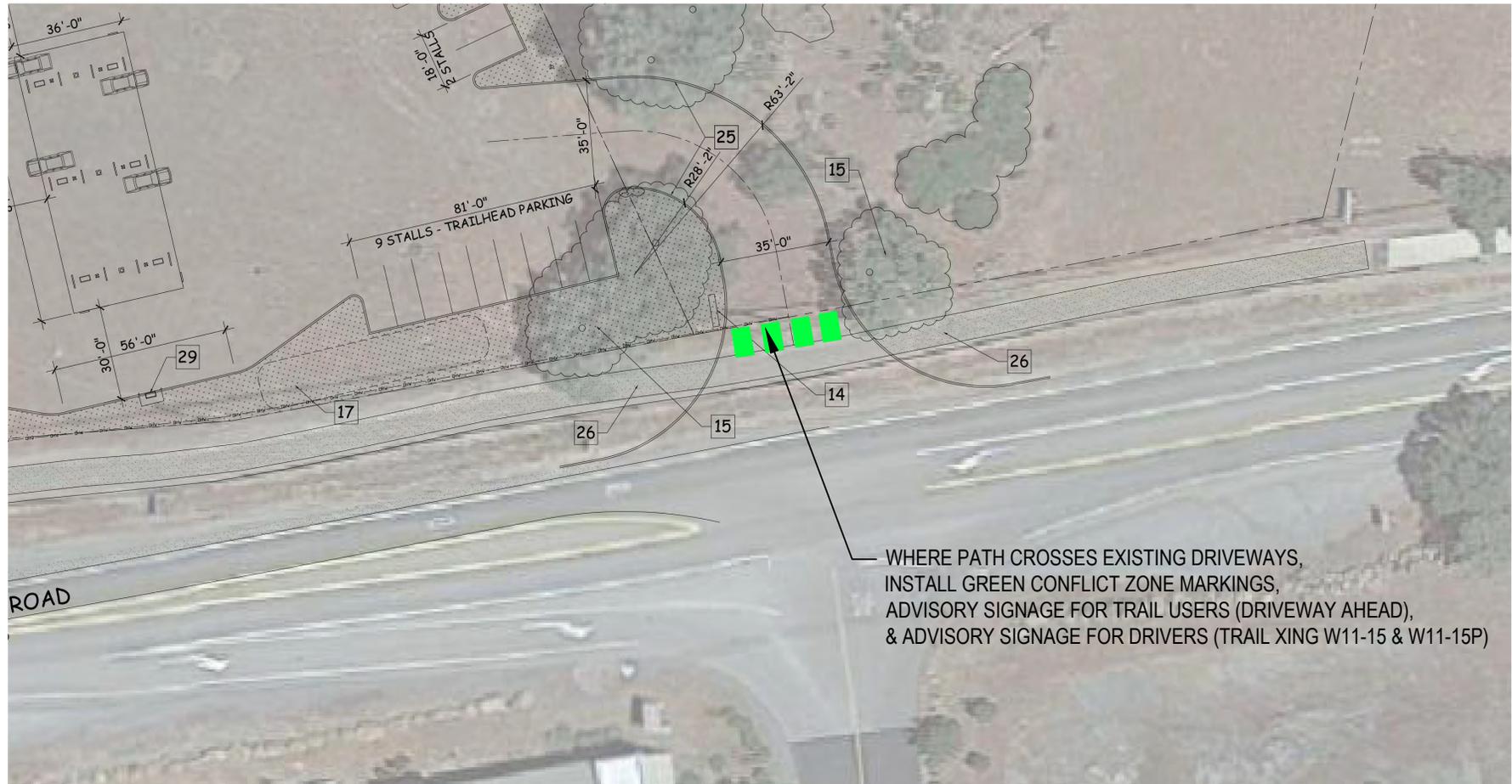
### 14.2 El Dorado County VMT Guidance

The County of El Dorado (County Board of Supervisors) adopted Resolution 141-2020<sup>10</sup> to create a framework and thresholds for VMT analysis in Resolution. The portions of the resolution relevant to the current analysis are (emphasis added):

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<sup>10</sup> County of El Dorado, Board of Supervisors, Resolution 141-2020, Adopting the El Dorado County “Vehicle Miles Traveled” Thresholds of Significance for Purposes of Analyzing Transportation Impacts Under the California Environmental Quality Act, October 6, 2020.

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 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study



MHA DESIGN SERVICES  
 COOL AUTOMOBILE AND COMMERCIAL CENTER  
 TRAFFIC IMPACT ANALYSIS MEMORANDUM  
 MULTI-USE TRAIL MITIGATION  
 SIGNAGE AND MARKINGS

Project No. 12579129  
 Date 8/14/2023

**FIGURE 13.4**

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Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

- 3) *The County shall generally use the El Dorado County Travel Demand Model for establishing the baseline VMT for the unincorporated County as a whole and calculating VMT for specific projects in order to apply the significance thresholds and screening tools adopted herein. However, **a different method of calculating VMT may be used if, in the exercise of sound engineering judgement, a different method is determined to be more accurate because the unique circumstances of a particular project or particular use that are not captured in the El Dorado County Travel Demand Model result in an underestimation or overestimation of VMT.** Any such deviations in calculating VMT shall be explained in the written analysis relied on in the environmental analysis for CEQA.*
- 4) *The County shall use the **Countywide VMT average** as the measure of transportation impacts for CEQA compliance.*
- 6) *The **County shall apply the significant threshold of 15%**, as recommended by OPR's Technical Advisory, below baseline for residential and office land use and **no net increase for retail projects.** Consistent with OPR's Technical Advisory, the Board finds that a proposed project exceeding a level of 15 percent below the existing VMT per capita may indicate a significant transportation impact.*

The approach used to analyze the current project conforms to this framework, as will be described in the next sub-section.

### 14.3 VMT Analysis of Cool Automobile and Commercial Center

The Proposed Project consists entirely of retail and service establishments. The VMT associated with such a project would have two components, one deriving from the trips made by employees of the new establishments, and the second deriving from the trips made by the patrons.

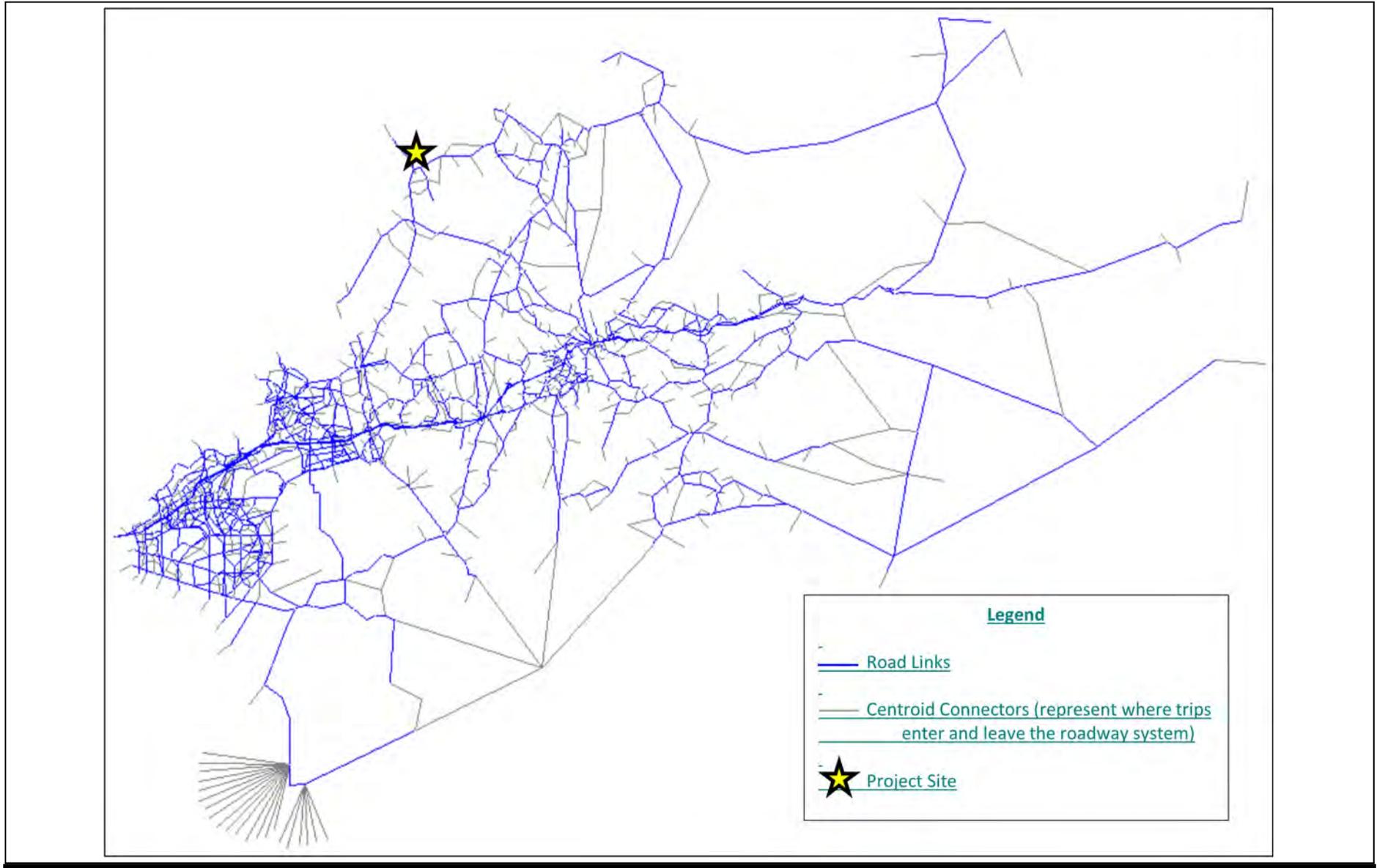
Initial consideration was given to using the El Dorado County Travel Demand Model to analyze these components. However, in this case the project site is located at the very edge of the modeled area (see **Figure 14.1**). For a variety of technical reasons, traffic models are most accurate towards their center, where most of the trips are from land uses that are explicitly represented in the model and where the majority of calibration points are located. The closer one gets to the edge of a model the higher the percentage of trips are from external land uses that are represented very abstractly, and the less calibration is done. This is somewhat analogous to focusing a camera; when you focus on an object in the center, objects on the edges become blurry. For that reason, as allowed in Section 3 of 141-2020, GHD elected to use Big Data from Replica<sup>12</sup> to examine each of these components rather than the county-wide model. Replica is used by cities, counties, states, MPOs, and transit agencies of all sizes around the country. SACOG, for example, uses Replica.

Replica represents movement by combining data from three primary sources: public use population census data, proprietary locational data from telecommunications and other IT infrastructure in the region, and field observations data from customer public agencies (ground truth). Much of its data comes from cell phones or in-vehicle GPS devices that track individual trips. Although the data is anonymized to protect the privacy of travelers, Replica is able to determine the residential and employment locations of travelers in general terms (i.e. neighborhoods rather than individual addresses). This provides a rich, new data source of travel behavior.

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<sup>12</sup> For more information see: <https://www.replicahq.com/>

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Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study



MHA DESIGN SERVICES  
COOL AUTOMOBILE AND COMMERCIAL CENTER  
TRAFFIC IMPACT ANALYSIS MEMORANDUM

PROJECT SITE IN RELATION TO THE  
EL DORADO COUNTY MODEL NETWORK

Project No. 12579129  
Date 1/17/2024

**FIGURE 14.1**

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study

GHD used Replica to determine the average trip length for work commutes, shopping trips, and dining trip for Cool and for El Dorado County as a whole. For the purposes of this analysis, “Cool” was defined as Block groups 1, 3, and 4 of El Dorado Census Tract 306.01 (see **Figure 14.2**). **Table 14.1** below compares the average trip lengths for Cool to those of El Dorado County as a whole. Note that the county average is the basis for comparison, per Section 4 of Resolution 141-2020.

**Table 14.1: Average Trip Lengths for Cool and El Dorado County**

Trip Purpose	Trip Origin			Trip Destination		
	Cool	El Dorado County	Percent Difference	Cool	El Dorado County	Percent Difference
	(A)	(B)	(C)=(A)/(B)-1	(D)	(E)	(F)=(D)/(E)-1
Work trips	39.4	22.7	74%	18.4	18.9	-3%
Shopping Trips	14.2	10.6	34%	9.8	11.3	-13%
Dining Trips	13.7	11.2	22%	7.4	12.2	-39%

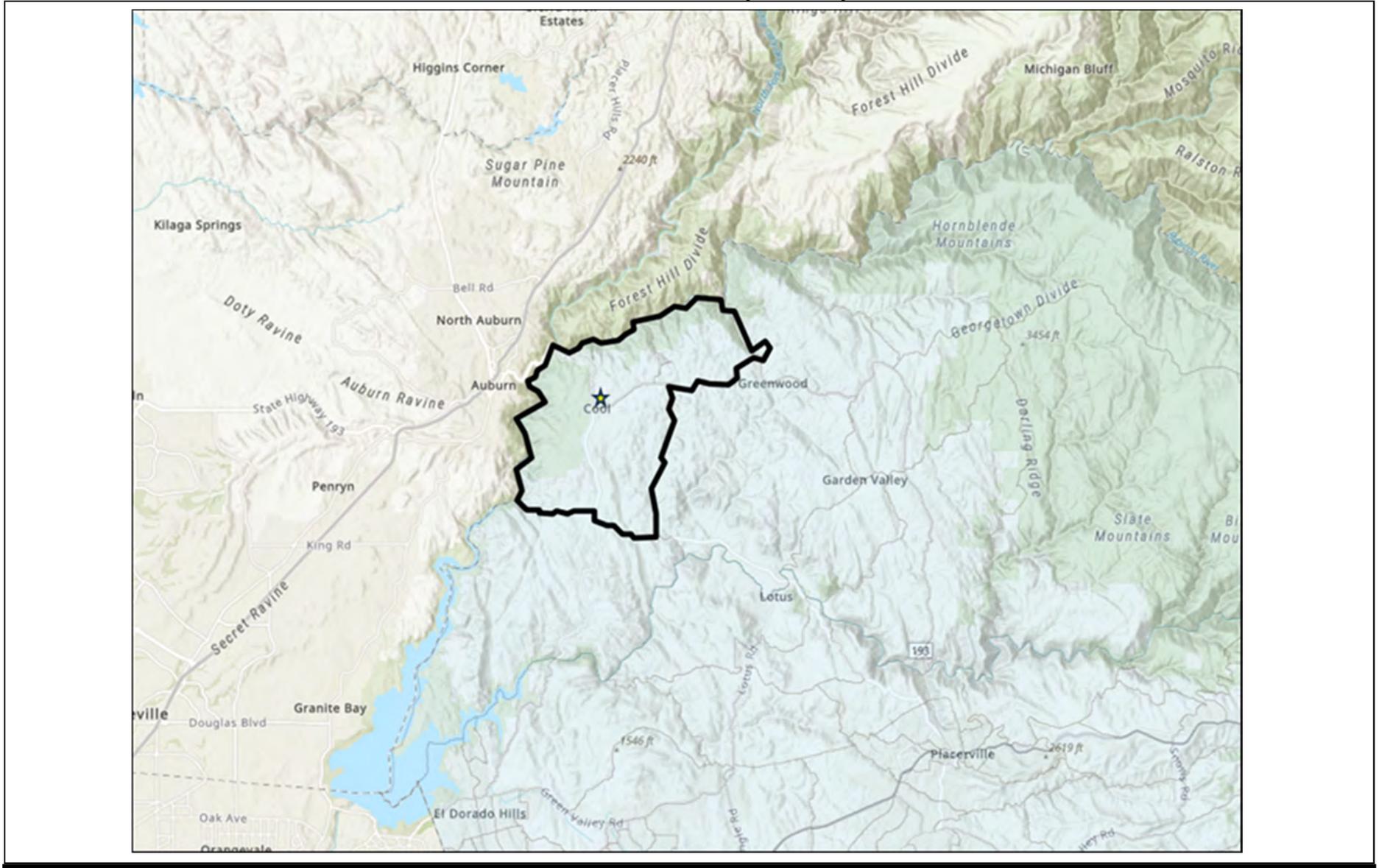
As can be seen in **Table 14.1**, residents of the Cool area drive significantly further than the county-wide average for work trips, shopping trips, and dining trips (see columns A, B, and C, which show data from when the Cool area is the trip origin). However, when Cool is the trip destination for work or for shopping, the trip lengths are shorter than the county-wide average (see columns D, E, and Fs, which show Cool as the destination). This is because the jobs/housing balance in the Cool area provides few opportunities to work and shop relative to the number of residents. For that reason, many of the jobs in the proposed development are likely to go to local residents who would otherwise work at jobs further away, and that the retail patrons would likely also be local residents substituting trips to the new establishments for trips to more distant shops. Outside residents who use the shops are likely to be pass-by trips will little net increase in VMT arising from their entering and leaving the site.

Other sources of data support the conclusion that the Proposed Project would result in a net decrease in VMT. A before-and-after study of the effects of a new retail development in Davis, California<sup>13</sup> found that shoppers self-selected the nearer shopping option when stores sold similar products, resulting in a net reduction in VMT. In addition, the International Council of Shopping Centers (ICSC) developed a classification system for retail establishments based on information from a database of over 115,000 sites in the U.S. (see **Table 14.2**). They found that small retail centers, which averaged 13 KSF in size (the Proposed Project is 11.7 KSF) typically had the smallest trade area. This is consistent with the finding from Replica that the Proposed Project is likely to serve a local clientele.

Based on this analysis, which shows that the Proposed Project is likely to result in a net decrease in VMT, we conclude that the Proposed Project’s VMT impacts will be less-than-significant.

<sup>13</sup> *Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California.* Lovejoy, Sciara, Salon, Handy, and Mokhtarian, 2013.

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MHA DESIGN SERVICES  
 COOL AUTOMOBILE AND COMMERCIAL CENTER  
 TRAFFIC IMPACT ANALYSIS MEMORANDUM

**BOUNDARY OF THE COOL AREA  
 FOR THE PURPOSE OF THIS ANALYSIS**

Project No. 12579129  
 Date 1/17/2024

**FIGURE 14.2**

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**Table 14.2 U.S. Shopping Center Classification and Characteristics**

U.S. Shopping-Center Classification and Characteristics												
Type of Shopping Center	Concept	Center Count	Aggregate GLA (Sq. Ft.)	% Share of Industry GLA	Average Size (Sq. Ft.)	Typical GLA Range (Sq. Ft.)	Acres	# of Anchors	% Anchor GLA	Typical Number of Tenants	Typical Type of Anchors	Trade Area Size
<b>General-Purpose Centers</b> 112,520												
Super-Regional Mall	Similar in concept to regional malls, but offering more variety and assortment.	620	778,336,548	10.2%	1,255,382	800,000+	60-120	3+	50-70%	NA	Full-line or junior department store, mass merchant, discount department store and/or fashion apparel store.	5-25 miles
Regional Mall	General merchandise or fashion-oriented offerings. Typically, enclosed with inward-facing stores connected by a common walkway. Parking surrounds the outside perimeter.	600	353,795,548	4.7%	589,659	400,000-800,000	40-100	2+	50-70%	40-80 stores	Full-line or junior department store, mass merchant, discount department store and/or fashion apparel store.	5-15 miles
Community Center ("Large Neighborhood Center")	General merchandise or convenience-oriented offerings. Wider range of apparel and other soft goods offerings than neighborhood centers. The center is usually configured in a straight line as a strip, or may be laid out in an L or U shape, depending on the site and design.	9,776	1,930,849,736	25.4%	197,509	125,000-400,000	10-40	2+	40-60%	15-40 stores	Discount store, supermarket, drug, large-specialty discount (toys, books, electronics, home improvement/furnishings or sporting goods, etc.)	3-6 miles
Neighborhood Center	Convenience oriented.	32,588	2,340,711,371	30.8%	71,827	30,000-125,000	3-5	1+	30-50%	5-20 stores	Supermarket	3 miles
Strip/Convenience	Attached row of stores or service outlets managed as a coherent retail entity, with on-site parking usually located in front of the stores. Open canopies may connect the store fronts, but a strip center does not have enclosed walkways linking the stores. A strip center may be configured in a straight line, or have an "L" or "U" shape. A convenience center is among the smallest of the centers, whose tenants provide a narrow mix of goods and personal services to a very limited trade area.	68,936	911,202,922	12.0%	13,218	< 30,000	<3	Anchor-less or a small convenience-store anchor.	NA	NA	Convenience store, such as a mini-mart.	<1 mile
<b>Specialized-Purpose Centers</b> 3,275												
Power Center	Category-dominant anchors, including discount department stores, off-price stores, wholesale clubs, with only a few small tenants.	2,258	990,416,667	13.0%	438,626	250,000-600,000	25-80	3+	70-90%	NA	Category killers, such as home improvement, discount department, warehouse club and off-price stores	5-10 miles
Lifestyle	Upscale national-chain specialty stores with dining and entertainment in an outdoor setting.	491	164,903,247	2.2%	335,852	150,000-500,000	10-40	0-2	0-50%	NA	Large format upscale specialty	8-12 miles
Factory Outlet	Manufacturers' and retailers' outlet stores selling brand-name goods at a discount.	367	87,368,113	1.2%	238,060	50,000-400,000	10-50	NA	NA	NA	Manufacturers' and retailers' outlets	25-75 miles
Theme/Festival	Leisure, tourist, retail and service-oriented offerings with entertainment as a unifying theme. Often located in urban areas, they may be adapted from older--sometimes historic--buildings and can be part of a mixed-use project.	159	23,498,769	0.3%	147,791	80,000-250,000	5-20	Unspecified	NA	NA	Restaurants, entertainment	25-75 miles
<b>Limited-Purpose Property</b> 62												
Airport Retail	Consolidation of retail stores located within a commercial airport	62	15,452,860	0.2%	249,240	75,000-300,000	NA	NA	NA	NA	No anchors; retail includes specialty retail and restaurants	NA
<b>Total Industry</b> 115,857												
Total Industry	Traditional + Specialty + Special Purpose	115,857	7,596,535,781	100.0%	65,568							

Source: International Council of Shopping Centers ([https://www.icsc.com/uploads/research/general/US\\_CENTER\\_CLASSIFICATION.pdf](https://www.icsc.com/uploads/research/general/US_CENTER_CLASSIFICATION.pdf))

## 15. Mitigations and Recommendations

### 15.1 Existing Plus Project Conditions

The traffic operations analysis has found that under Existing Plus Project conditions, all four project study intersections would operate acceptably (LOS D or better) and vehicle queuing would not exceed measured storage capacity. In addition, roadway segment operation on SR 49 north and south of SR 193 and SR 193 east of SR 49 would be acceptable. However, traffic operations analyses of proposed project driveway operations at SR 49 and SR 193 associate with vehicle/truck access as well as pedestrian and bicycle safety would be significant in nature. Specifically, project driveway operations related to large truck access, safe vehicle access, and pedestrian/bicycle safety would be impacted by proposed project development. In response, GHD recommends the following improvements:

- SR 193/Ellinghouse Drive/Project Driveway: The internal curve radius on the project driveway at SR 193 (located approximately 80-100 feet from SR 193) has been enlarged and straightened to allow acceptable truck access. As shown in the conceptual driveway plan in **Figure 13.2**, the driveway has been re-aligned to enter the site at a more northerly direction allowing large trucks to ingress/egress acceptably without affecting opposing traffic flows.
- SR 49/Retail Driveway-Project Driveway: It is recommended that a separate outbound (westbound) left-through lane and right-turn lane (12-feet each) be striped with a 16-foot inbound lane (eastbound) to accommodate for efficient ingress/egress.
- SR 193/Ellinghouse Drive/Project Driveway: It is recommended that SR 193 be widened and/or re-striped to accommodate a separate inbound (eastbound) left-turn lane for the proposed project driveway. Based on conceptual design parameters (*Caltrans HDM*), the left-turn lane should have a storage capacity of 75-feet (3 car lengths) with a bay taper of approximately 290-feet based on vehicle speeds (less than 45 mph) and lane width (11-feet).
- SR 193/Ellinghouse Drive/Project Driveway: It is recommended that where the proposed project driveway crosses the Class I pedestrian/bicycle path on the north side of SR 193 install green conflict zone markings. In addition, there should be warning signage for trail users (DRIVEWAY AHEAD) and warning signage for motorists (TRAIL XING W11-15 & W11-15P). Consideration should be given to the installation of “sharks tooth” pavement markings for north-south driveway approaches prior to crossing the trail.
- California heavy vehicles accessing the proposed project site should be routed on SR 49 between Highway 50 and Cool (to the extent possible). As part of this recommendation, signs should be placed at outbound project driveway points indicating “Large Trucks Prohibited on SR 49 Segment North to Auburn.”
- Design of proposed project driveways on SR 49 and SR 193 will be consistent with Appendix J of the Caltrans Highway Design (HDM—Figure 205.1, see Attachment I).
- Caltrans will require an encroachment permit for any project-related work along or within the State Right-of-Way (ROW).

With the circulation improvements recommended above, study intersection LOS was re-calculated and has been shown in **Table 15.1**.

As presented in **Table 15.1**, all four study intersections would be operating at or above acceptable levels (LOS Existing Plus Project Conditions).

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**TABLE 15.1 MITIGATED STUDY INTERSECTION LEVEL-OF-SERVICE**

ID	Intersection	Peak Hour	Existing Plus Project Plus Mitigation			Near Term Plus Project Plus Mitigation			Cumulative Plus Project Plus Mitigation		
			Control	Delay	LOS	Control	Delay	LOS	Control	Delay	LOS
1	Highway 49 (Coloma Road) & Northside Drive	AM	TWSC	12.3	B	TWSC	12.7	B	TWSC	13.1	B
		PM		15.2	C		15.3	C		16.2	C
2	Highway 49 (Coloma Road) & Retail Driveway/Project Driveway	AM	TWSC	16.3	C	TWSC	18.0	C	TWSC	19.5	C
		PM		19.4	C		20.3	C		22.7	C
3	Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)	AM	AWSC	11.0	B	AWSC	12.0	B	AWSC	12.7	B
		PM		14.8	B		19.3	C		23.7	C
4	Ellinghouse Drive/Highway 193 (Georgetown Road)	AM	TWSC	11.9	B	TWSC	12.6	B	TWSC	13.1	B
		PM		21.0	C		21.4	C		24.3	C

**BOLD** Indicates LOS of E or worse

- 1 TWSC = Two-Way-Stop-Control, Vehicle delay based on minor street stopped traffic (worst case).
- 2 AWSC = All-Way-Stop-Control, Vehicle delay based on average delay for each approach (worst case).

In addition to the recommended project-specific intersection mitigation identified as part of this analysis, the State Route 49 American River Confluence Study also suggests intersection operation analyses at the SR 49/SR 193 intersection.

- Perform an Intersection Control Evaluation (ICE) study at the intersection of SR 49 and SR 193 to determine suitability of a roundabout or other configuration that would support future traffic volumes should they reach a level unsupported by the current stop control intersection.

Should El Dorado County move forward with an ICE study for the SR 49/SR 193 intersection, the proposed project could contribute a proportional fair share towards the analysis. It is noted that suggested operational analyses of the SR 49/SR 193 are supported by Caltrans.

## 15.2 Near-Term Year 2032 Plus Project Conditions

The traffic operations analysis has found that under Near-Term Year 2032 Plus Project conditions, all four project study intersections would operate acceptably (LOS C or better) and vehicle queuing would not exceed measured storage capacity. In addition, roadway segment operation on SR 49 north and south of SR 193 and SR 193 east of SR 49 would be acceptable. Therefore, the same mitigation measures recommended for Existing Plus Project Conditions would apply to proposed project development under Near-Term Year 2032 Plus Project Conditions.

As presented in **Table 13.1**, all four study intersections would be operating at or above acceptable levels (LOS Near-Term Year 2032 Plus Project Conditions).

## 15.3 Cumulative Year 2042 Plus Project Conditions

The traffic operations analysis has found that under Cumulative Year 2042 Plus Project conditions, all four project study intersections would operate acceptably (LOS D or better) and vehicle queuing would not exceed measured storage capacity. With the circulation improvements recommended from Existing Plus Project Conditions, Cumulative Year 2042 Plus Project study intersection LOS was re-calculated and has been shown in **Table 13.1**. All four study intersections would be operating at or above acceptable levels (LOS C-D) during the AM and PM peak hour with recommended circulation improvements.

## 15.4 On Site Circulation

Patrons would access the project site via State Route 49 and/or State Route 193 at the two project driveways. Internal drive aisles would provide access to both parking and vehicle fueling positions located on the southern portion of the project site. As shown in **Figure 2.1**, the main retail and restaurant buildings would be south-facing with parking areas located directly in front of the buildings. In addition, parking areas would be located primarily along the western, eastern, and limited southern portions of the site. Motorists (and large trucks) would be able to circulate through the site in a circular fashion (if necessary) via a large internal drive extending around the rear of the commercial retail buildings. Patrons using the project driveway inbound (northbound) from SR 193 would cross over the existing Class I pedestrian/bike shared use path and then extend west into the site. To allow for the topography and physical fauna, the driveway would curve west into the site approximately 80-100 feet north of SR 193. Therefore, it is likely that outbound vehicles from the site would queue across the existing Class I pedestrian/bike shared use path. Based on discussions with the project applicant, the existing bike path would be re-aligned to accommodate pedestrians and bicyclists.

## 15.5 Parking Analysis

The proposed project's parking requirements were calculated using the El Dorado County parking ordinance for retail sales and service, restaurant (with drive-through), and neighborhood retail (<15k). As calculated, the proposed project would be required to provide 36 parking spaces based on County parking code requirements. The proposed project's parking supply would be 81 spaces providing a surplus of 45 parking spaces.

## 15.6 Project Description

The proposed 4,620 square-foot convenience market with 12 fueling positions and car wash, 2,585 square-foot QSR with drive-through, and 2,582 square-foot future retail pad project in Cool California is expected to generate 4,442 daily trips with 112 AM net new peak hour trips and 105 net new PM peak hour trips. This trip generation does capture both pass-by and internal trip reductions. It is noted that pass-by trips reductions do not reduce driveway traffic volumes.

The proposed project will be accessed via SR 49 and SR 193 through two (2) full-access driveways. The proposed project driveway on SR 49 would be located approximately 400-feet north of SR 193 whereas the project driveway on SR 193 would be directly opposite Ellinghouse Drive approximately 600 feet east of SR 49.

It is noted that a review of the proposed project site plan indicates that it would not encroach on potential ROW needed along SR 49 or SR 193 for potential conversion to a RAB control at the SR 49/SR 193 intersection.

## 15.7 VMT Analysis

As shown in **Table 14.1**, residents of the Cool area drive significantly further than the county-wide average for work trips, shopping trips, and dining trips (see columns A, B, and C, which show data from when the Cool area is the trip origin). However, when Cool is the trip destination for work or for shopping, the trip lengths are shorter than the county-wide average (see columns D, E, and Fs, which show Cool as the destination). This is because the jobs/housing balance in the Cool area provides few opportunities to work and shop relative to the number of residents. For that reason, many of the jobs in the proposed development are likely to go to local residents who would otherwise work at jobs further away, and that the retail patrons would likely also be local residents substituting trips to the new establishments for trips to more distant shops. Outside residents who use the shops are likely to be pass-by trips will little net increase in VMT arising from their entering and leaving the site

The proposed Cool Automotive and Commercial-Retail project and is a purely local-serving retail development and does not exceed 50,000 square feet. From a CEQA standpoint, a strong case could be made that all proposed project uses (gasoline, convenience market, car wash, and quick-service restaurant) are locally serving retail. None of the proposed project uses would be considered a regional draw in that all of these

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similar retail uses are available in Auburn and/or Georgetown areas. In addition, “strip commercial centers”, “mini-marts”, and/or “convenience stores” are considered purely local in nature serving the needs of the adjacent communities. Based on research conducted by the International Council of Shopping Centers, strip-convenience centers typically have a trade area of one-mile or less. As shown in **Table 14.2**, strip-convenience centers with a convenience store as its anchor (or anchor-less) draw from areas of one-mile or less.

Based on the retail case studies and shopping center characteristics for retail uses (strip commercial-convenience stores) provided above, the development of proposed project uses would likely reduce overall VMT in the Cool area. By providing locally serving retail uses, area residents would be less likely to travel longer distances to access similar retail services. Based on this quantitative VMT analysis, which shows that the Proposed Project is likely to result in a net decrease in VMT, GHD concludes the Proposed Project’s VMT impacts will be less-than-significant.

## **15.8 Traffic Operations**

All four project study intersections and three roadway segments are expected to operate at acceptable conditions (LOS D or better) under Existing, Near-Term Year 2032, and Cumulative Year 2042 (No Project) conditions. With proposed project traffic, study intersections and roadway segments would continue to operate acceptable levels. However, large truck driveway access as well as vehicle-pedestrian conflicts would occur with proposed project development at the SR 49 and SR 193 project driveways. As a result, circulation improvements have been recommended to mitigate AM and PM peak hour conditions as outlined in **Section 14.1**. With recommended circulation improvements, all four study intersections and roadway segments would be operating at acceptable levels during the AM and PM peak hour under all analyzed scenarios of Existing, Near-Term Year 2032, and Cumulative Year 2042 “with project” conditions. In addition, the intersection of SR 49/SR 193 would continue to meet the minimum volumes for signalization (CAMUTCD Warrant #3) during the PM peak hour with existing traffic volumes. Proposed project development would add to this warrant. However, the SR 49/SR 193 intersection is projected to operate acceptably (LOS D or better) under all “with project” scenarios.

Please note, Caltrans will require an encroachment permit for any project-related work along or within the State Right-of-Way (ROW). In addition design of proposed project driveways on SR 49 and SR 193 should be consistent with Appendix J of the Caltrans Highway Design (HDM—Figure 205.1).

## **15.9 Alternative Transportation**

With the proposed project, the Class I pedestrian/bicycle shared use path would be re-designed (east or west) along the proposed project’s SR 193 frontage to provide acceptable access and improve safety. In addition, a Class II bicycle lane would be installed along the proposed project’s western frontage of SR 49 to provide improved bicycle access along the highway. Internal sidewalks would be provided around all on-site commercial-retail buildings. Bicycle racks will be provided for uses adjacent to Class I path connections and on-site buildings. In addition, supplemental parking spaces would be provided for trail parking.

## **15.10 Emergency Access**

Emergency access is adequately provided through the project driveways on SR 49 and SR 193.

## **15.11 Safety Analysis**

Based on review of the past five years of collision data, there was a total of six (6) collisions at the three primary study intersections along SR 49 and SR 193. There were no fatal or severe injury collisions, and all three intersections are experiencing collision rates below the California State average for similar facilities. In addition, the proposed project driveway on SR 193 is located directly opposite Ellinghouse Drive serving the existing Holiday Market development directly south of the project site. The creation of a four-way intersection

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on SR 193 helps to reduce potential vehicle-pedestrian conflicts and provides a uniform operation for vehicle ROW with no driveway offset.

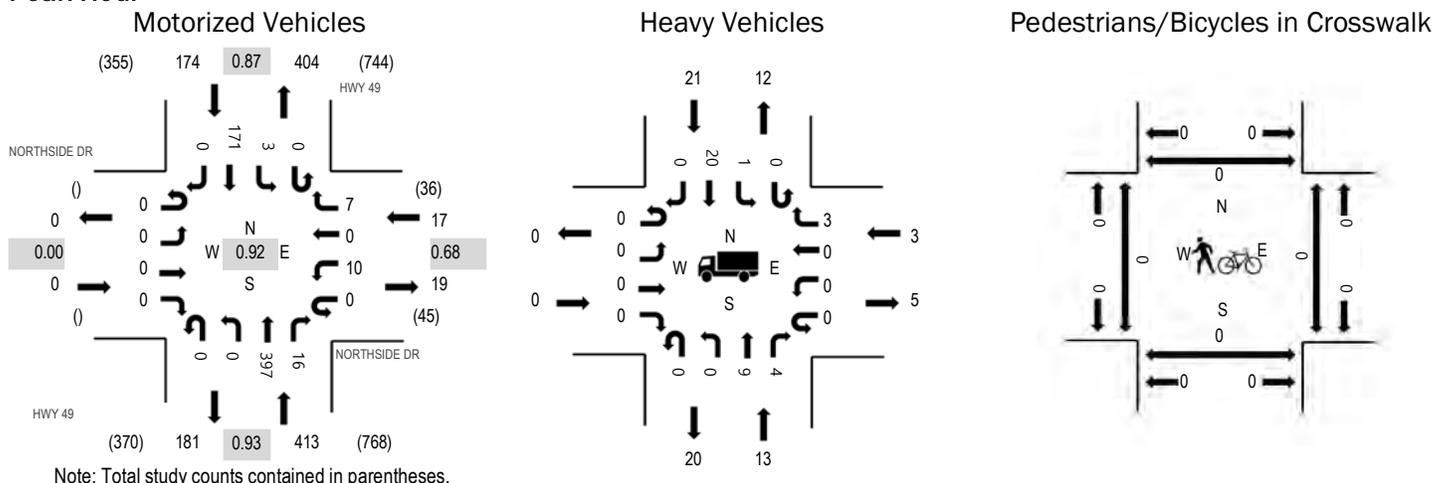
## Attachment A: Turning Movement Counts

# DR22-0007 Cool Station Automobile - based Commercial Project Exhibit K Traffic Analysis Study



**Location:** 1 HWY 49 & NORTHSIDE DR AM  
**Date:** Thursday, July 28, 2022  
**Peak Hour:** 07:00 AM - 08:00 AM  
**Peak 15-Minutes:** 07:00 AM - 07:15 AM

## Peak Hour



## Traffic Counts - Motorized Vehicles

Interval Start Time	NORTHSIDE DR Eastbound				NORTHSIDE DR Westbound				HWY 49 Northbound				HWY 49 Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	0	0	0	3	0	1	0	0	97	4	0	1	59	0	165	604
7:15 AM	0	0	0	0	0	4	0	3	0	0	99	4	0	0	34	0	144	555
7:30 AM	0	0	0	0	0	1	0	2	0	0	109	2	0	2	27	0	143	553
7:45 AM	0	0	0	0	0	2	0	1	0	0	92	6	0	0	51	0	152	557
8:00 AM	0	0	0	0	0	0	0	1	0	0	73	4	0	0	38	0	116	555
8:15 AM	0	0	0	0	0	2	0	3	0	0	90	6	0	2	39	0	142	
8:30 AM	0	0	0	0	0	4	0	2	0	0	88	3	0	0	50	0	147	
8:45 AM	0	0	0	0	0	5	0	2	0	0	81	10	0	1	51	0	150	
Count Total	0	0	0	0	0	21	0	15	0	0	729	39	0	6	349	0	1,159	
Peak Hour	0	0	0	0	0	10	0	7	0	0	397	16	0	3	171	0	604	

## Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

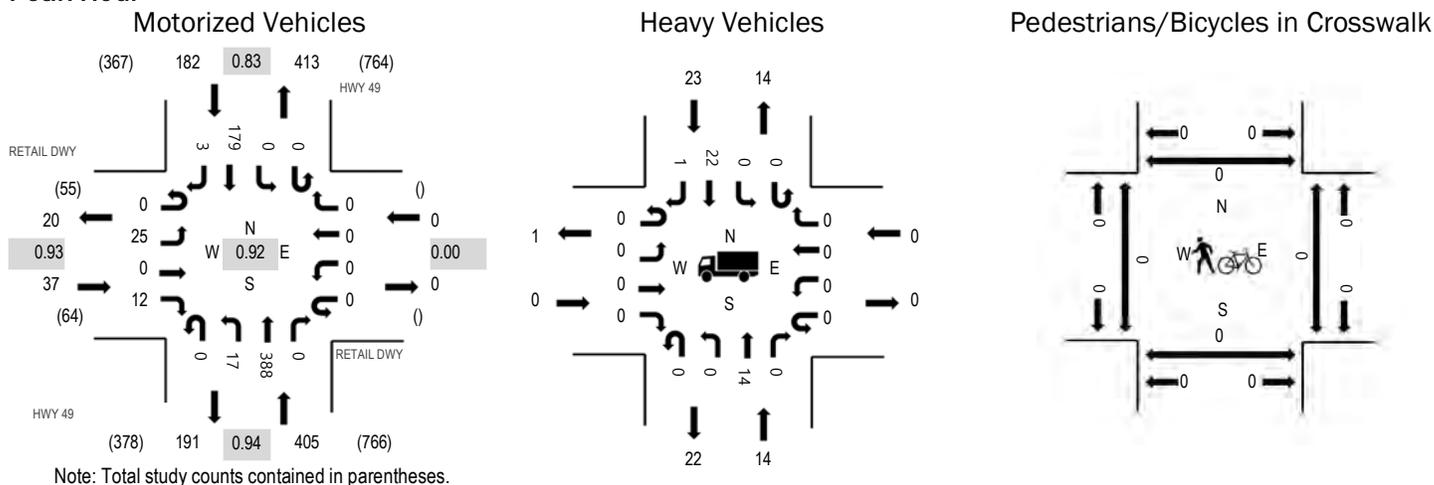
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	3	0	16	19	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:15 AM	0	2	2	2	6	7:15 AM	0	1	0	0	1	7:15 AM	0	0	0	0	0
7:30 AM	0	8	0	3	11	7:30 AM	0	1	0	0	1	7:30 AM	0	0	0	0	0
7:45 AM	0	0	1	0	1	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
8:00 AM	0	1	0	3	4	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:15 AM	0	2	0	3	5	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:30 AM	0	3	2	1	6	8:30 AM	0	1	0	0	1	8:30 AM	0	0	0	0	0
8:45 AM	0	2	1	3	6	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
Count Total	0	21	6	31	58	Count Total	0	3	0	0	3	Count Total	0	0	0	0	0
Peak Hour	0	13	3	21	37	Peak Hour	0	2	0	0	2	Peak Hour	0	0	0	0	0

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**Location:** 2 HWY 49 & RETAIL DWY AM  
**Date:** Thursday, July 28, 2022  
**Peak Hour:** 07:00 AM - 08:00 AM  
**Peak 15-Minutes:** 07:00 AM - 07:15 AM

**Peak Hour**



	HV%	PHF
EB	0.0%	0.93
WB	0.0%	0.00
NB	3.5%	0.94
SB	12.6%	0.83
All	5.9%	0.92

**Traffic Counts - Motorized Vehicles**

Interval Start Time	RETAIL DWY Eastbound				RETAIL DWY Westbound				HWY 49 Northbound				HWY 49 Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	7	0	2	0	0	0	0	0	8	93	0	0	0	59	1	170	624
7:15 AM	0	6	0	4	0	0	0	0	0	3	99	0	0	0	40	0	152	572
7:30 AM	0	6	0	4	0	0	0	0	0	4	104	0	0	0	27	1	146	569
7:45 AM	0	6	0	2	0	0	0	0	0	2	92	0	0	0	53	1	156	577
8:00 AM	0	4	0	3	0	0	0	0	0	4	70	0	0	0	36	1	118	573
8:15 AM	0	3	0	1	0	0	0	0	0	11	95	0	0	0	39	0	149	
8:30 AM	0	5	0	6	0	0	0	0	0	7	83	0	0	0	47	6	154	
8:45 AM	0	5	0	0	0	0	0	0	0	5	86	0	0	0	55	1	152	
Count Total	0	42	0	22	0	0	0	0	0	44	722	0	0	0	356	11	1,197	
Peak Hour	0	25	0	12	0	0	0	0	0	17	388	0	0	0	179	3	624	

**Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk**

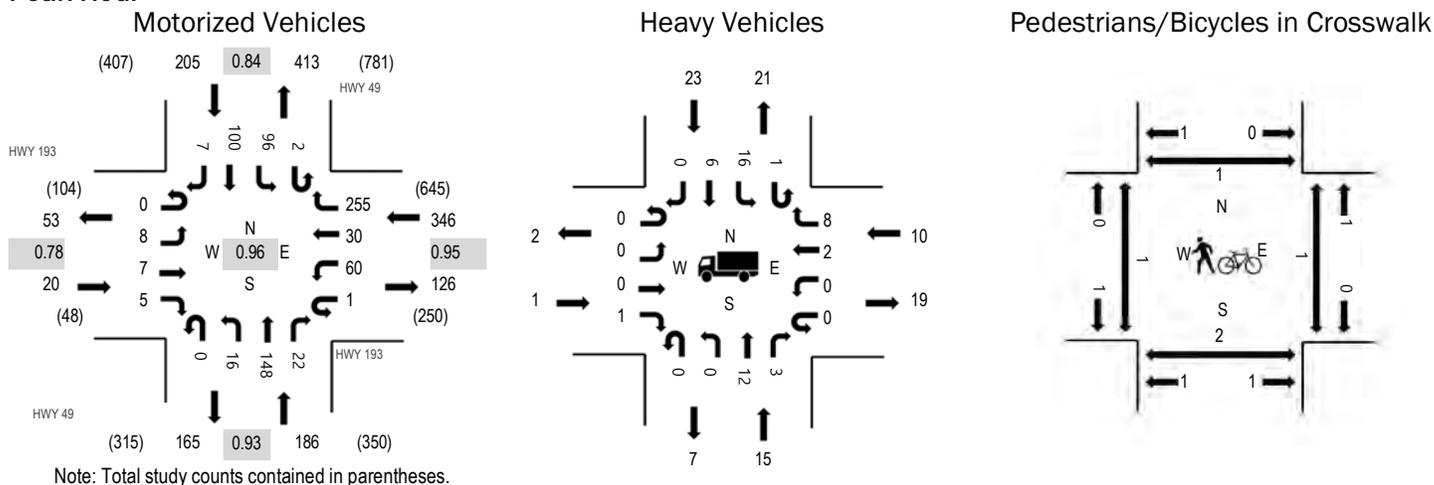
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	3	0	15	18	7:00 AM	0	1	0	0	1	7:00 AM	0	0	0	0	0
7:15 AM	0	3	0	4	7	7:15 AM	0	1	0	0	1	7:15 AM	0	0	0	0	0
7:30 AM	0	8	0	3	11	7:30 AM	0	1	0	1	2	7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	1	1	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
8:00 AM	0	1	0	4	5	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:15 AM	0	3	0	2	5	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:30 AM	0	3	0	4	7	8:30 AM	0	0	0	1	1	8:30 AM	0	0	0	0	0
8:45 AM	0	4	0	6	10	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
Count Total	0	25	0	39	64	Count Total	0	3	0	2	5	Count Total	0	0	0	0	0
Peak Hour	0	14	0	23	37	Peak Hour	0	3	0	1	4	Peak Hour	0	0	0	0	0

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**Location:** 3 HWY 49 & HWY 193 AM  
**Date:** Thursday, July 28, 2022  
**Peak Hour:** 07:00 AM - 08:00 AM  
**Peak 15-Minutes:** 07:00 AM - 07:15 AM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	5.0%	0.78
WB	2.9%	0.95
NB	8.1%	0.93
SB	11.2%	0.84
All	6.5%	0.96

**Traffic Counts - Motorized Vehicles**

Interval Start Time	HWY 193 Eastbound				HWY 193 Westbound				HWY 49 Northbound				HWY 49 Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right														
7:00 AM	0	1	1	1	1	12	10	68	0	5	33	5	0	34	26	1	198	757
7:15 AM	0	4	2	2	0	18	11	55	0	5	42	3	1	21	24	2	190	706
7:30 AM	0	2	1	1	0	16	4	67	0	1	38	5	1	16	18	1	171	701
7:45 AM	0	1	3	1	0	14	5	65	0	5	35	9	0	25	32	3	198	713
8:00 AM	0	2	4	1	0	10	6	44	0	7	27	5	1	18	22	0	147	693
8:15 AM	0	3	3	1	0	13	6	68	0	2	35	6	2	23	22	1	185	
8:30 AM	0	3	4	2	0	10	10	60	0	7	31	2	0	19	34	1	183	
8:45 AM	0	2	2	1	0	6	8	58	0	1	32	9	0	29	28	2	178	
Count Total	0	18	20	10	1	99	60	485	0	33	273	44	5	185	206	11	1,450	
Peak Hour	0	8	7	5	1	60	30	255	0	16	148	22	2	96	100	7	757	

**Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk**

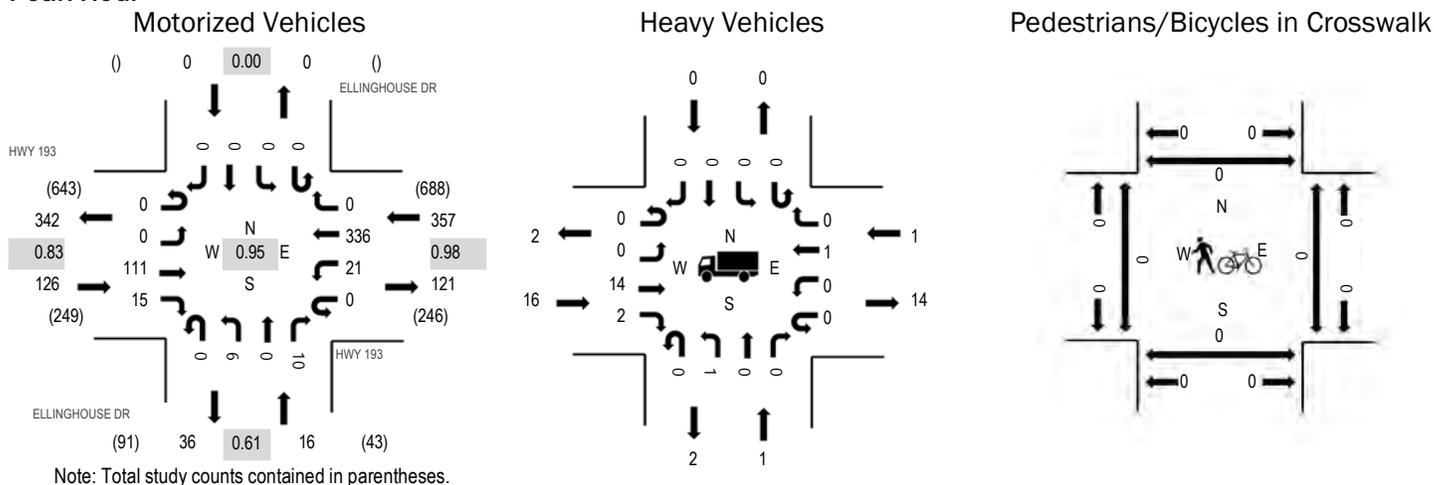
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	1	2	3	13	19	7:00 AM	0	0	0	0	0	7:00 AM	0	1	0	0	1
7:15 AM	0	5	2	5	12	7:15 AM	0	0	1	0	1	7:15 AM	0	0	0	0	0
7:30 AM	0	6	4	4	14	7:30 AM	0	0	0	1	1	7:30 AM	1	0	0	0	1
7:45 AM	0	2	1	1	4	7:45 AM	0	0	0	0	0	7:45 AM	0	1	1	1	3
8:00 AM	0	1	2	2	5	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:15 AM	0	5	0	4	9	8:15 AM	0	0	0	0	0	8:15 AM	1	0	0	0	1
8:30 AM	1	3	1	5	10	8:30 AM	0	0	0	0	0	8:30 AM	1	1	0	0	2
8:45 AM	0	2	2	7	11	8:45 AM	0	0	0	0	0	8:45 AM	0	1	0	0	1
Count Total	2	26	15	41	84	Count Total	0	0	1	1	2	Count Total	3	4	1	1	9
Peak Hour	1	15	10	23	49	Peak Hour	0	0	1	1	2	Peak Hour	1	2	1	1	5

# DR22-0007 Cool Station Automobile - based Commercial Project Exhibit K Traffic Analysis Study



**Location:** 4 ELLINGHOUSE DR & HWY 193 AM  
**Date:** Thursday, July 28, 2022  
**Peak Hour:** 07:00 AM - 08:00 AM  
**Peak 15-Minutes:** 07:45 AM - 08:00 AM

## Peak Hour



	HV%	PHF
EB	12.7%	0.83
WB	0.3%	0.98
NB	6.3%	0.61
SB	0.0%	0.00
All	3.6%	0.95

## Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 193 Eastbound				HWY 193 Westbound				ELLINGHOUSE DR Northbound				ELLINGHOUSE DR Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	35	3	0	3	86	0	0	1	0	2	0	0	0	0	130	499
7:15 AM	0	0	24	5	0	5	86	0	0	2	0	2	0	0	0	0	124	471
7:30 AM	0	0	21	1	0	4	82	0	0	2	0	4	0	0	0	0	114	484
7:45 AM	0	0	31	6	0	9	82	0	0	1	0	2	0	0	0	0	131	483
8:00 AM	0	0	22	4	0	12	59	0	0	1	0	4	0	0	0	0	102	481
8:15 AM	0	0	26	5	0	11	84	0	0	4	0	7	0	0	0	0	137	
8:30 AM	0	0	23	3	0	3	79	0	0	1	0	4	0	0	0	0	113	
8:45 AM	0	0	34	6	0	11	72	0	0	1	0	5	0	0	0	0	129	
Count Total	0	0	216	33	0	58	630	0	0	13	0	30	0	0	0	0	980	
Peak Hour	0	0	111	15	0	21	336	0	0	6	0	10	0	0	0	0	499	

## Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

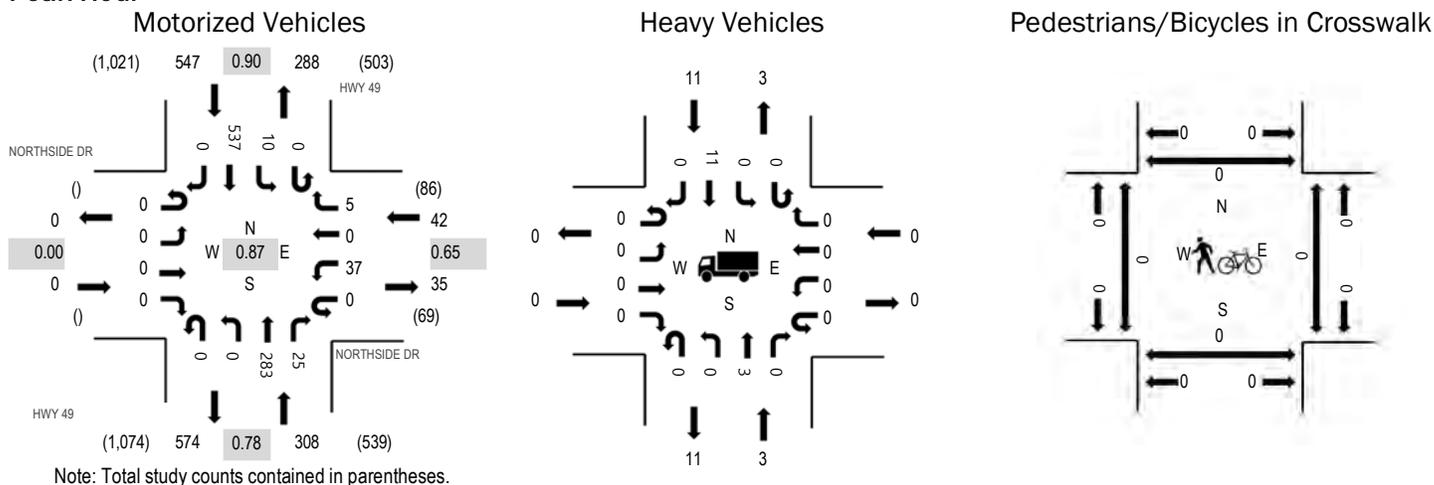
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	9	0	0	0	9	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:15 AM	4	0	0	0	4	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:30 AM	2	1	1	0	4	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:45 AM	1	0	0	0	1	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
8:00 AM	1	0	1	0	2	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:15 AM	2	0	1	0	3	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:30 AM	3	0	0	0	3	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:45 AM	1	0	1	0	2	8:45 AM	0	1	0	0	1	8:45 AM	0	0	0	0	0
Count Total	23	1	4	0	28	Count Total	0	1	0	0	1	Count Total	0	0	0	0	0
Peak Hour	16	1	1	0	18	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

# DR22-0007 Cool Station Automobile - based Commercial Project Exhibit K Traffic Analysis Study



**Location:** 1 HWY 49 & NORTHSIDE DR PM  
**Date:** Thursday, July 28, 2022  
**Peak Hour:** 04:00 PM - 05:00 PM  
**Peak 15-Minutes:** 04:00 PM - 04:15 PM

## Peak Hour



	HV%	PHF
EB	0.0%	0.00
WB	0.0%	0.65
NB	1.0%	0.78
SB	2.0%	0.90
All	1.6%	0.87

## Traffic Counts - Motorized Vehicles

Interval Start Time	NORTHSIDE DR Eastbound				NORTHSIDE DR Westbound				HWY 49 Northbound				HWY 49 Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	0	0	14	0	1	0	0	93	6	0	4	140	0	258	897
4:15 PM	0	0	0	0	0	7	0	0	0	0	58	4	0	0	120	0	189	811
4:30 PM	0	0	0	0	0	9	0	1	0	0	65	7	0	4	148	0	234	823
4:45 PM	0	0	0	0	0	7	0	3	0	0	67	8	0	2	129	0	216	791
5:00 PM	0	0	0	0	0	11	0	4	0	0	43	8	0	3	103	0	172	749
5:15 PM	0	0	0	0	0	6	0	1	0	0	56	5	0	3	130	0	201	
5:30 PM	0	0	0	0	0	5	0	0	0	0	71	7	0	3	116	0	202	
5:45 PM	0	0	0	0	0	15	0	2	0	0	38	3	0	2	114	0	174	
Count Total	0	0	0	0	0	74	0	12	0	0	491	48	0	21	1,000	0	1,646	
Peak Hour	0	0	0	0	0	37	0	5	0	0	283	25	0	10	537	0	897	

## Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

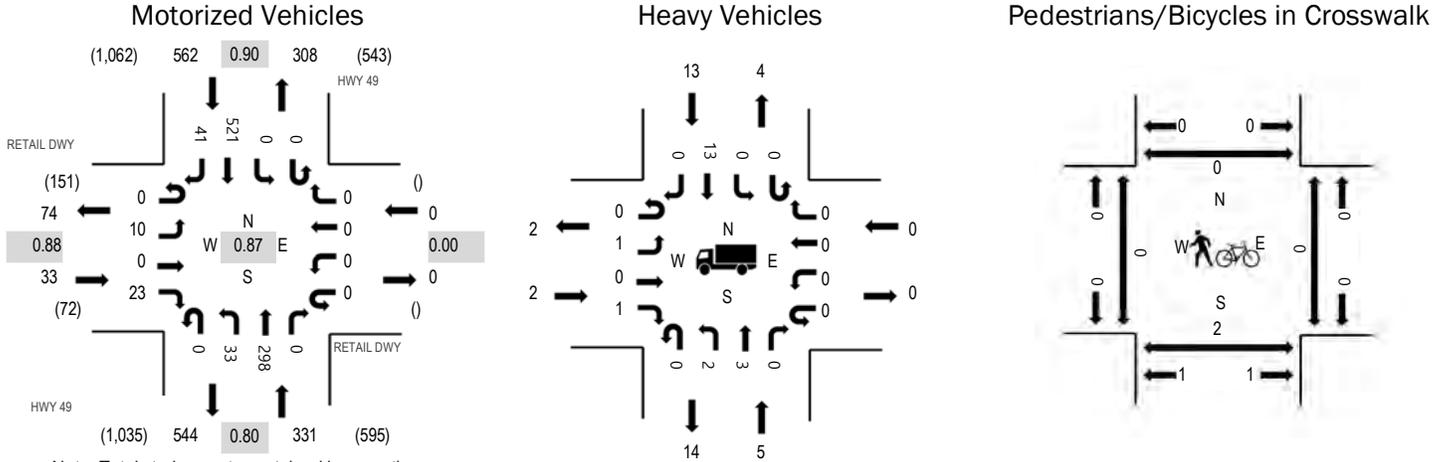
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	5	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	0	1	0	2	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:45 PM	0	2	0	2	4	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	0	3	0	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	0	5	1	0	6	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	0	13	1	11	25	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	0	3	0	11	14	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**



**Location:** 2 HWY 49 & RETAIL DWY PM  
**Date:** Thursday, July 28, 2022  
**Peak Hour:** 04:00 PM - 05:00 PM  
**Peak 15-Minutes:** 04:00 PM - 04:15 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	6.1%	0.88
WB	0.0%	0.00
NB	1.5%	0.80
SB	2.3%	0.90
All	2.2%	0.87

**Traffic Counts - Motorized Vehicles**

Interval Start Time	RETAIL DWY Eastbound				RETAIL DWY Westbound				HWY 49 Northbound				HWY 49 Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	3	0	8	0	0	0	0	0	6	97	0	0	0	139	14	267	926
4:15 PM	0	4	0	3	0	0	0	0	0	8	59	0	0	0	118	8	200	844
4:30 PM	0	1	0	6	0	0	0	0	0	7	71	0	0	0	150	6	241	861
4:45 PM	0	2	0	6	0	0	0	0	0	12	71	0	0	0	114	13	218	832
5:00 PM	0	2	0	10	0	0	0	0	0	10	50	0	0	0	101	12	185	803
5:15 PM	0	2	0	8	0	0	0	0	0	11	61	0	0	0	128	7	217	
5:30 PM	0	7	0	5	0	0	0	0	0	8	72	0	0	0	111	9	212	
5:45 PM	0	2	0	3	0	0	0	0	0	13	39	0	0	0	125	7	189	
Count Total	0	23	0	49	0	0	0	0	0	75	520	0	0	0	986	76	1,729	
Peak Hour	0	10	0	23	0	0	0	0	0	33	298	0	0	0	521	41	926	

**Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk**

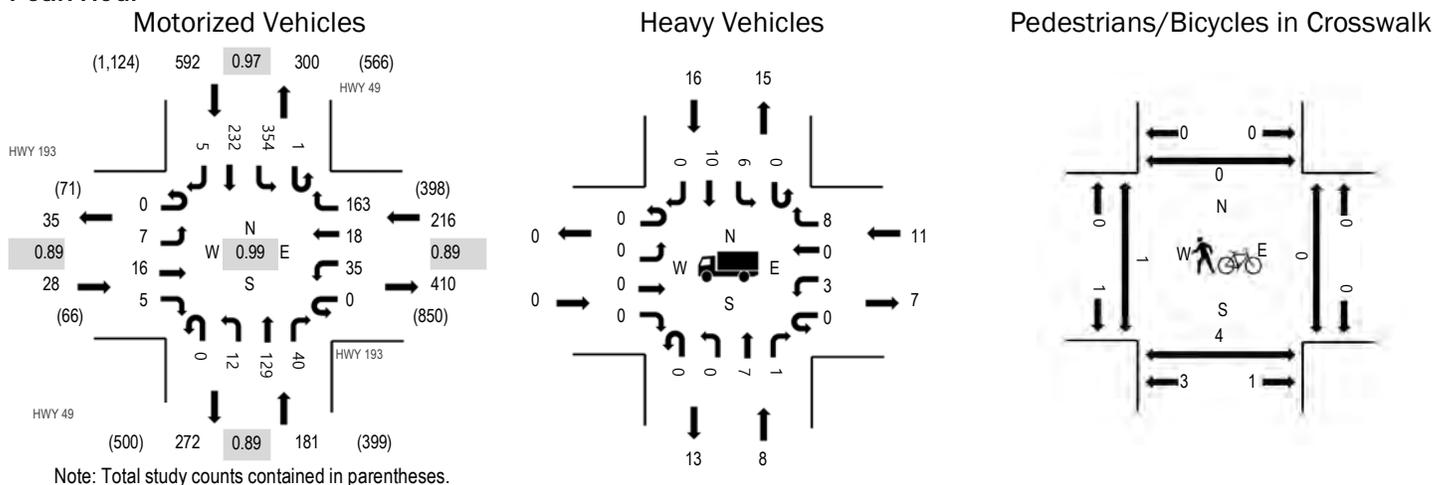
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk					
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total	
4:00 PM	0	1	0	0	3	4	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:15 PM	0	2	0	0	3	5	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	1	0	0	0	3	4	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:45 PM	1	2	0	0	4	7	4:45 PM	0	0	0	0	0	4:45 PM	0	2	0	0	2
5:00 PM	0	1	0	0	1	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	2	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	0	3	0	0	1	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	0	5	0	0	0	5	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	2	15	0	0	15	32	Count Total	0	0	0	0	0	Count Total	0	2	0	0	2
Peak Hour	2	5	0	0	13	20	Peak Hour	0	0	0	0	0	Peak Hour	0	2	0	0	2

# DR22-0007 Cool Station Automobile - based Commercial Project Exhibit K Traffic Analysis Study



**Location:** 3 HWY 49 & HWY 193 PM  
**Date:** Thursday, July 28, 2022  
**Peak Hour:** 04:00 PM - 05:00 PM  
**Peak 15-Minutes:** 04:45 PM - 05:00 PM

## Peak Hour



	HV%	PHF
EB	0.0%	0.89
WB	5.1%	0.89
NB	4.4%	0.89
SB	2.7%	0.97
All	3.4%	0.99

## Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 193 Eastbound				HWY 193 Westbound				HWY 49 Northbound				HWY 49 Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right														
4:00 PM	0	4	5	0	0	8	3	33	0	5	34	12	0	89	63	0	256	1,017
4:15 PM	0	0	3	2	0	12	4	40	0	2	29	16	0	89	51	1	249	988
4:30 PM	0	2	3	1	0	6	5	49	0	2	27	8	0	83	68	1	255	1,008
4:45 PM	0	1	5	2	0	9	6	41	0	3	39	4	1	93	50	3	257	995
5:00 PM	0	1	6	2	0	10	3	28	0	1	29	20	1	91	33	2	227	970
5:15 PM	0	1	9	1	0	18	2	41	0	2	32	20	0	97	45	1	269	
5:30 PM	0	4	3	4	0	8	6	31	0	7	45	9	1	73	47	4	242	
5:45 PM	0	1	6	0	0	8	6	21	0	1	29	23	1	83	52	1	232	
Count Total	0	14	40	12	0	79	35	284	0	23	264	112	4	698	409	13	1,987	
Peak Hour	0	7	16	5	0	35	18	163	0	12	129	40	1	354	232	5	1,017	

## Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	3	2	5	10	4:00 PM	0	0	0	0	0	4:00 PM	1	4	0	0	5
4:15 PM	0	0	4	4	8	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	0	3	4	3	10	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:45 PM	0	2	1	4	7	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	0	1	3	2	6	5:15 PM	0	0	0	0	0	5:15 PM	0	0	1	0	1
5:30 PM	0	1	4	0	5	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	0	4	2	0	6	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	0	14	21	18	53	Count Total	0	0	0	0	0	Count Total	1	4	1	0	6
Peak Hour	0	8	11	16	35	Peak Hour	0	0	0	0	0	Peak Hour	1	4	0	0	5

# DR22-0007 Cool Station

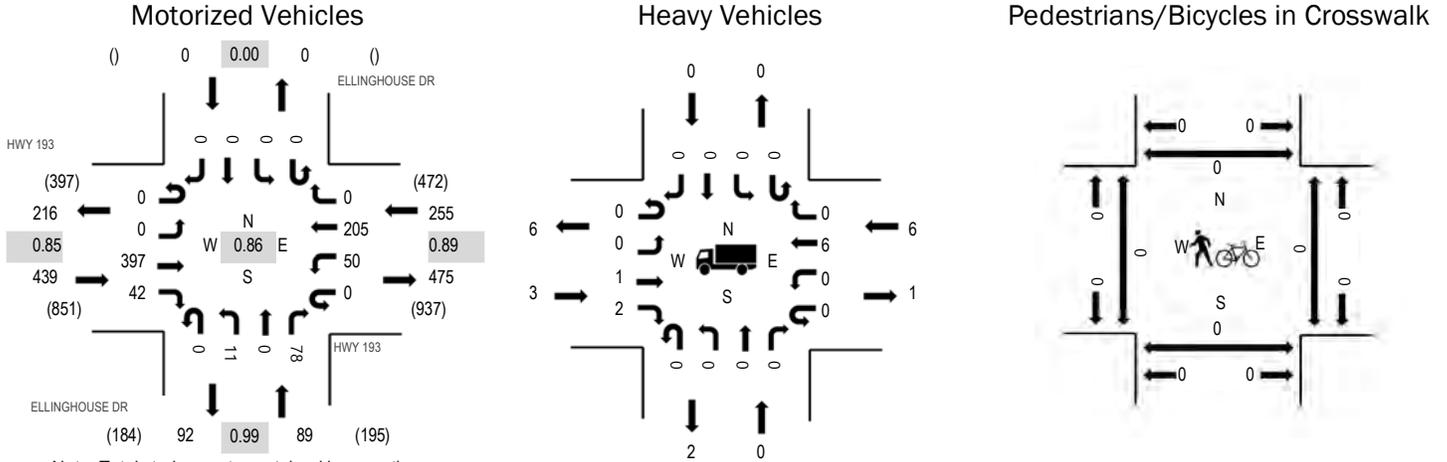
## Automobile - based Commercial Project

### Exhibit K Traffic Analysis Study



**Location:** 4 ELLINGHOUSE DR & HWY 193 PM  
**Date:** Thursday, July 28, 2022  
**Peak Hour:** 04:30 PM - 05:30 PM  
**Peak 15-Minutes:** 05:15 PM - 05:30 PM

#### Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.7%	0.85
WB	2.4%	0.89
NB	0.0%	0.99
SB	0.0%	0.00
All	1.1%	0.86

#### Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 193 Eastbound				HWY 193 Westbound				ELLINGHOUSE DR Northbound				ELLINGHOUSE DR Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	96	12	0	12	42	0	0	3	0	21	0	0	0	0	186	763
4:15 PM	0	0	95	13	0	14	52	0	0	5	0	20	0	0	0	0	199	754
4:30 PM	0	0	83	8	0	9	54	0	0	4	0	21	0	0	0	0	179	783
4:45 PM	0	0	92	12	0	15	55	0	0	1	0	24	0	0	0	0	199	775
5:00 PM	0	0	104	10	0	12	38	0	0	3	0	10	0	0	0	0	177	755
5:15 PM	0	0	118	12	0	14	58	0	0	3	0	23	0	0	0	0	228	
5:30 PM	0	0	76	10	0	12	42	0	0	2	0	29	0	0	0	0	171	
5:45 PM	0	0	101	9	0	10	33	0	0	2	0	24	0	0	0	0	179	
Count Total	0	0	765	86	0	98	374	0	0	23	0	172	0	0	0	0	1,518	
Peak Hour	0	0	397	42	0	50	205	0	0	11	0	78	0	0	0	0	783	

#### Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	1	2	0	4	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:15 PM	0	1	1	0	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	2	0	2	0	4	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	1	0	2	0	3	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	1	0	3	0	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	0	0	2	0	2	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	5	2	14	0	21	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	3	0	6	0	9	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

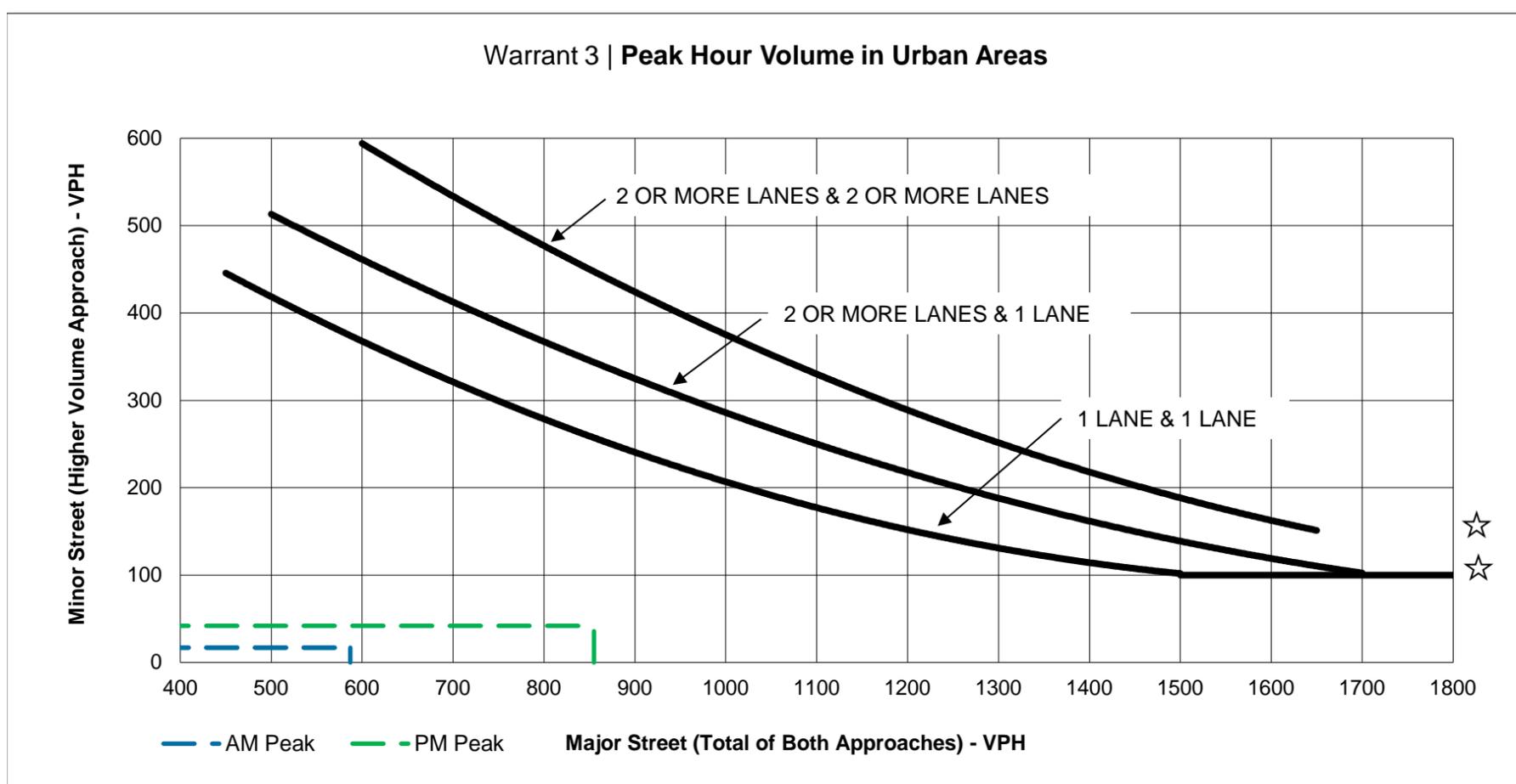
## Attachment B: Peak Hour Signal Warrants

**Intersection #1: Highway 49 & Northstar Drive**

**Existing Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



**NOTE:**

150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

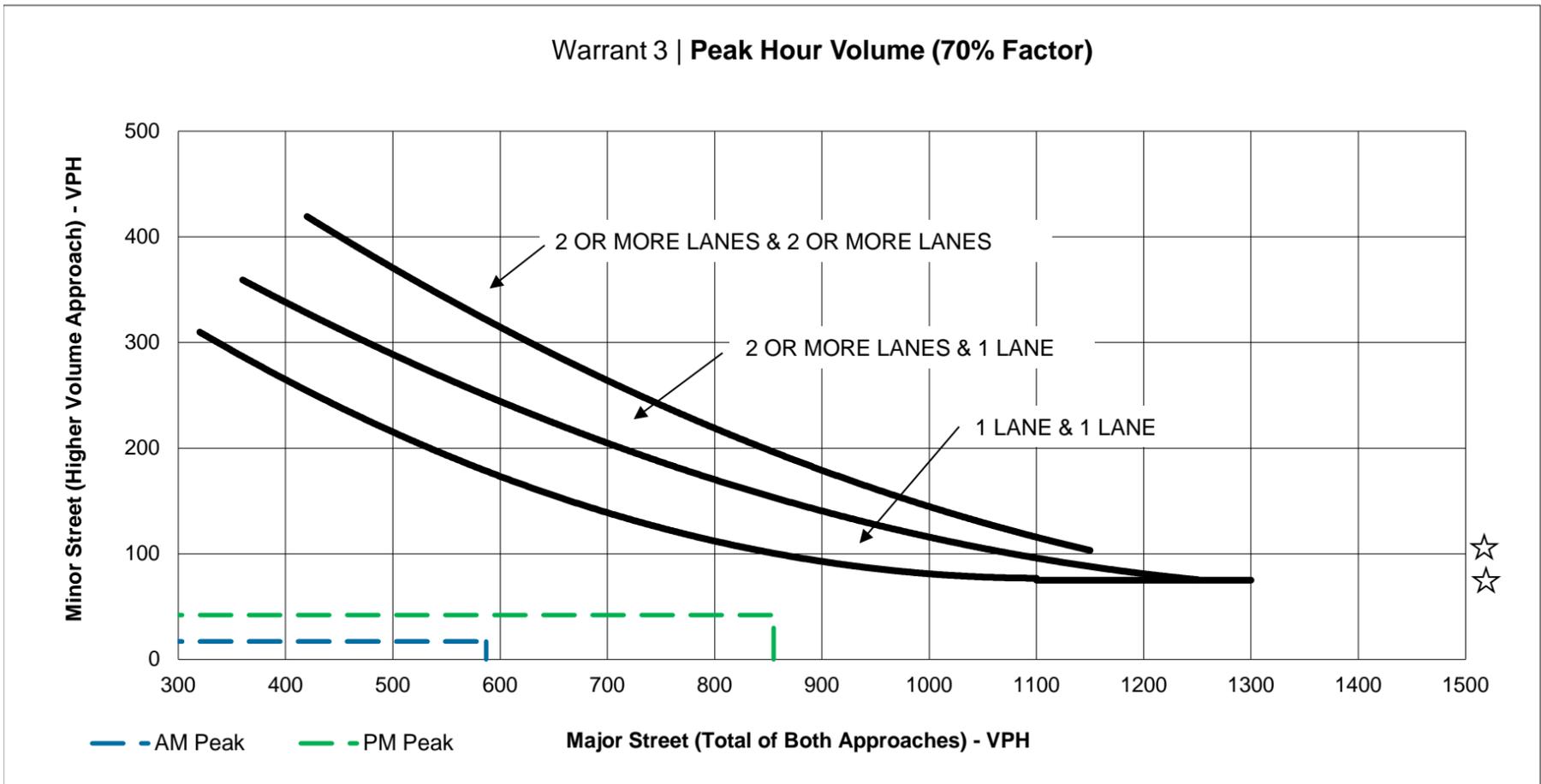
	Number of Lanes		
Major Approach	SR 49	2	
Minor Approach	Northside Dr.	1	
	AM Peak	PM Peak	Volumes for higher minor street
Major St. Volume (both approaches):	587	855	
Minor St. Volume (higher volume approach):	17	42	
Warrant Met?:	No	No	

Fig 4C-3 (100% Option)

**Existing Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

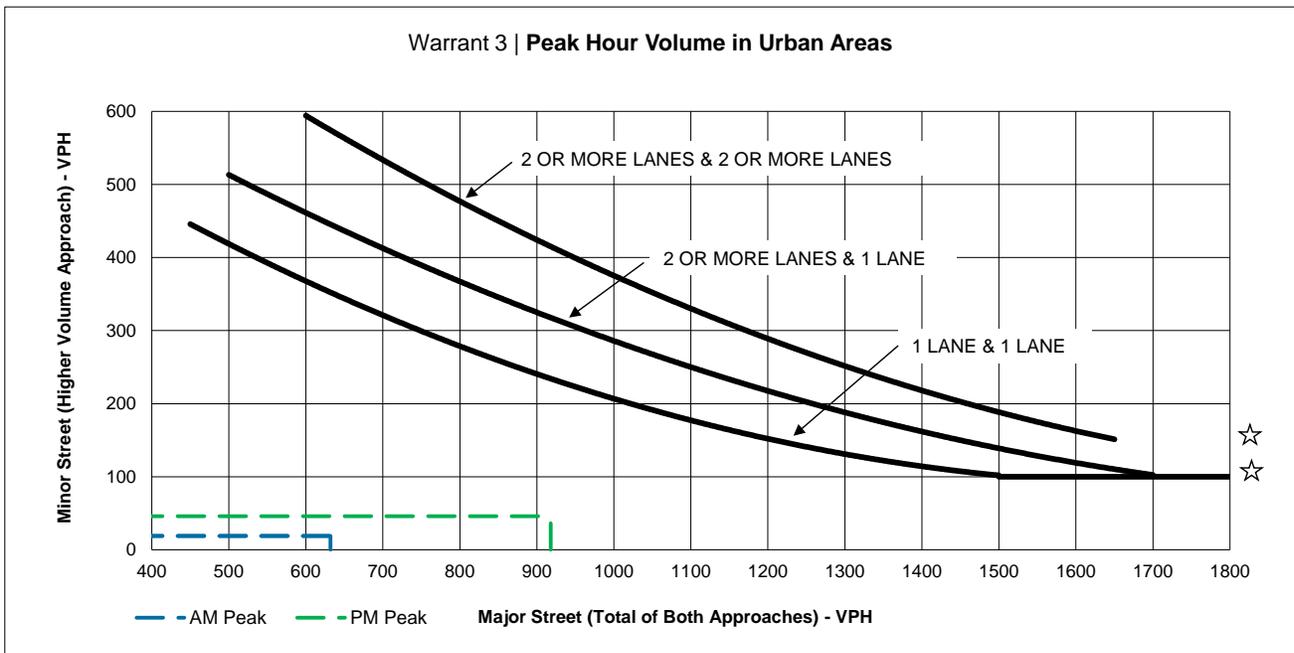
SCENARIO (AM/PM)		Number of Lanes	
Major Approach	SR 49	2	
Minor Approach	Northside Dr.	1	
	AM Peak	PM Peak	Volumes for higher minor street
Major St. Volume (both approaches):	587	855	
Minor St. Volume (higher volume approach):	17	42	
Warrant Met?:	No	No	

Fig 4C-4 (70% Option)

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Near Term Conditions**  
**Signal Warrant 3: Peak Hour**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



**NOTE:**

150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

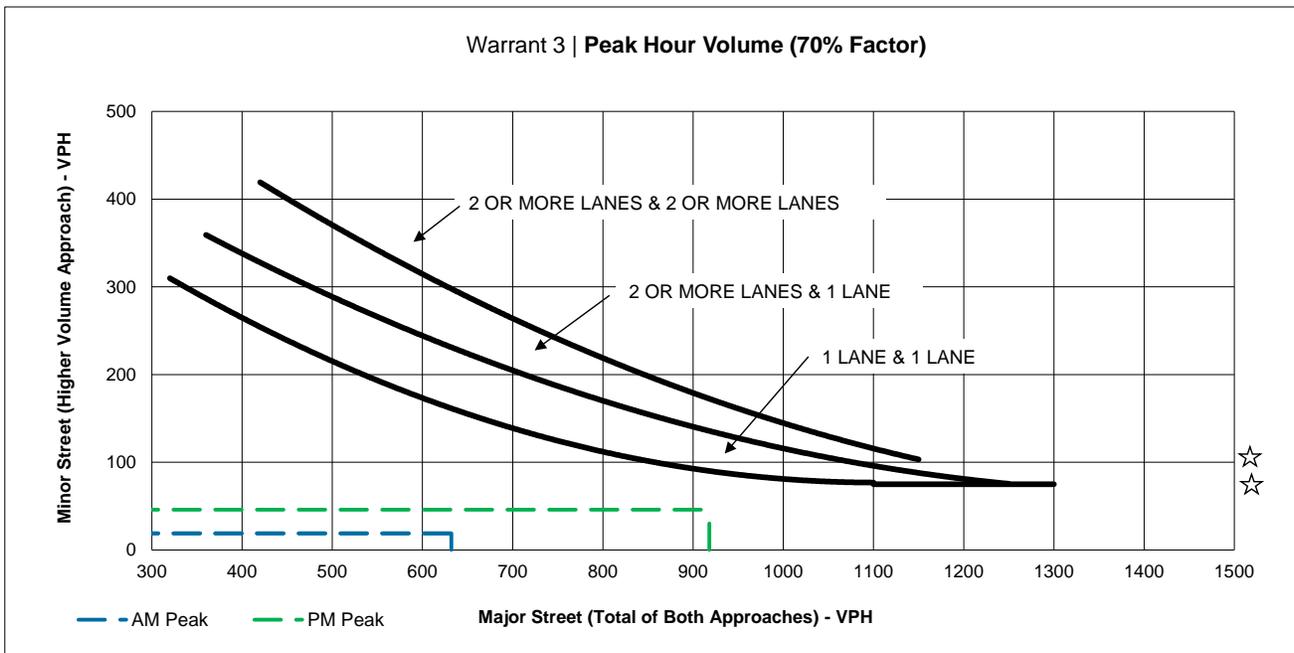
Major Approach	Number of Lanes		Volumes for higher minor street
	AM Peak	PM Peak	
SR 49		2	
Minor Approach	Northside Dr.		
		1	
Major St. Volume (both approaches):	632	918	
Minor St. Volume (higher volume approach):	19	46	
Warrant Met?:	NO	NO	

Fig 4C-3 (100% Option)

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study  
**Near Term Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
	AM Peak	PM Peak	
Major Approach	SR 49	2	
Minor Approach	Northside Dr.	1	
Major St. Volume (both approaches):	632	918	
Minor St. Volume (higher volume approach):	19	46	
Warrant Met?:	NO	NO	

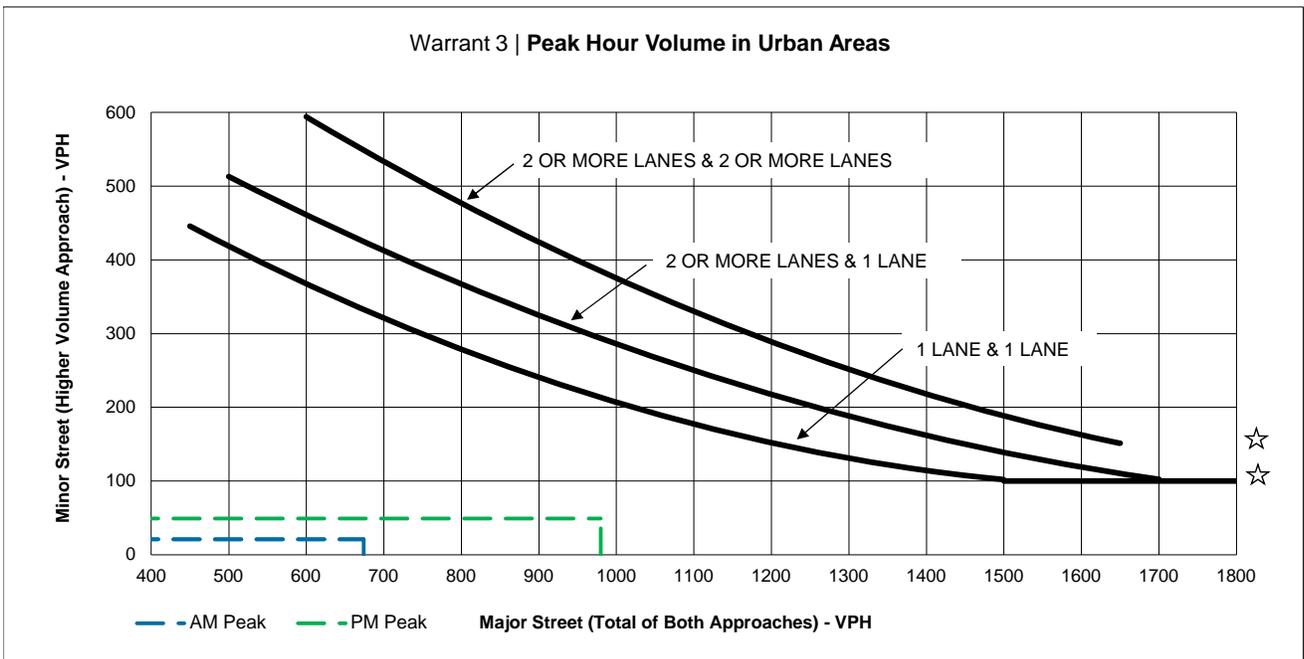
Fig 4C-4 (70% Option)

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Cumulative Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

	Number of Lanes	
Major Approach	SR 49	2
Minor Approach	Northside Dr.	1
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	674	980
Minor St. Volume (higher volume approach):	21	49
Warrant Met?:	<b>NO</b>	<b>NO</b>

**Volumes for higher minor street**

Fig 4C-3 (100% Option)

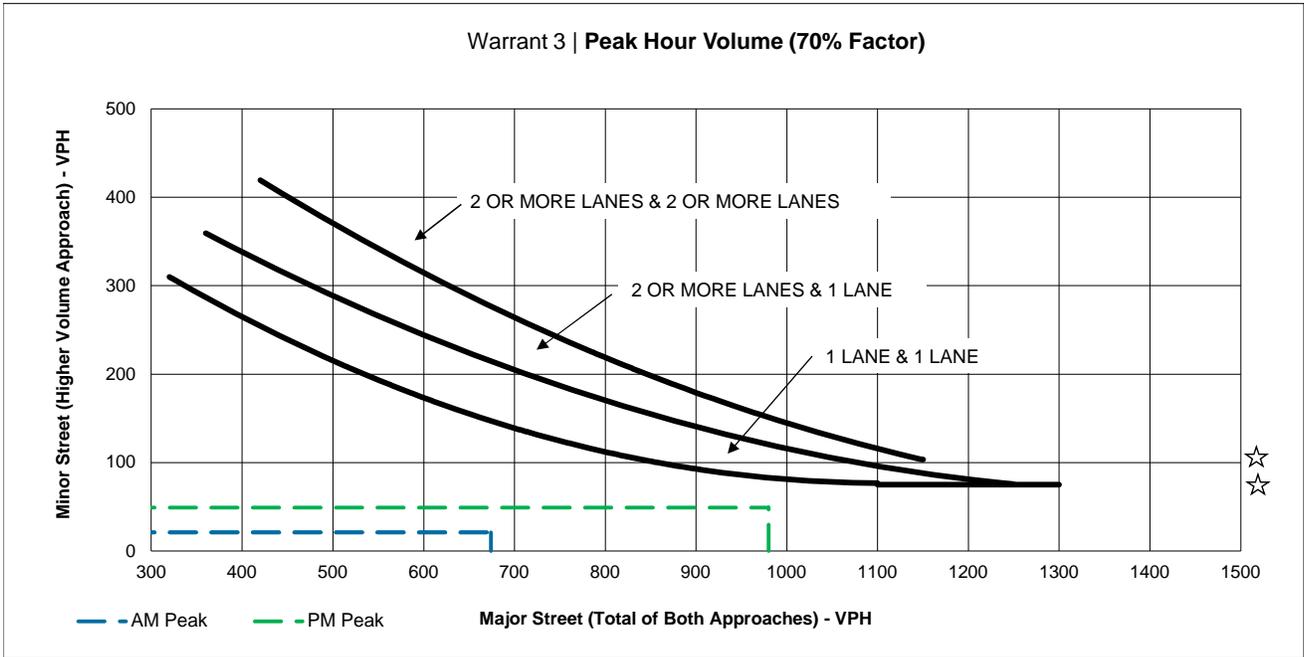
DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Cumulative Conditions**

Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

		Number of Lanes
Major Approach	SR 49	2
Minor Approach	Northside Dr.	1
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	674	980
Minor St. Volume (higher volume approach):	21	49
Warrant Met?:	<b>NO</b>	<b>NO</b>

**Volumes for higher minor street**

Fig 4C-4 (70% Option)

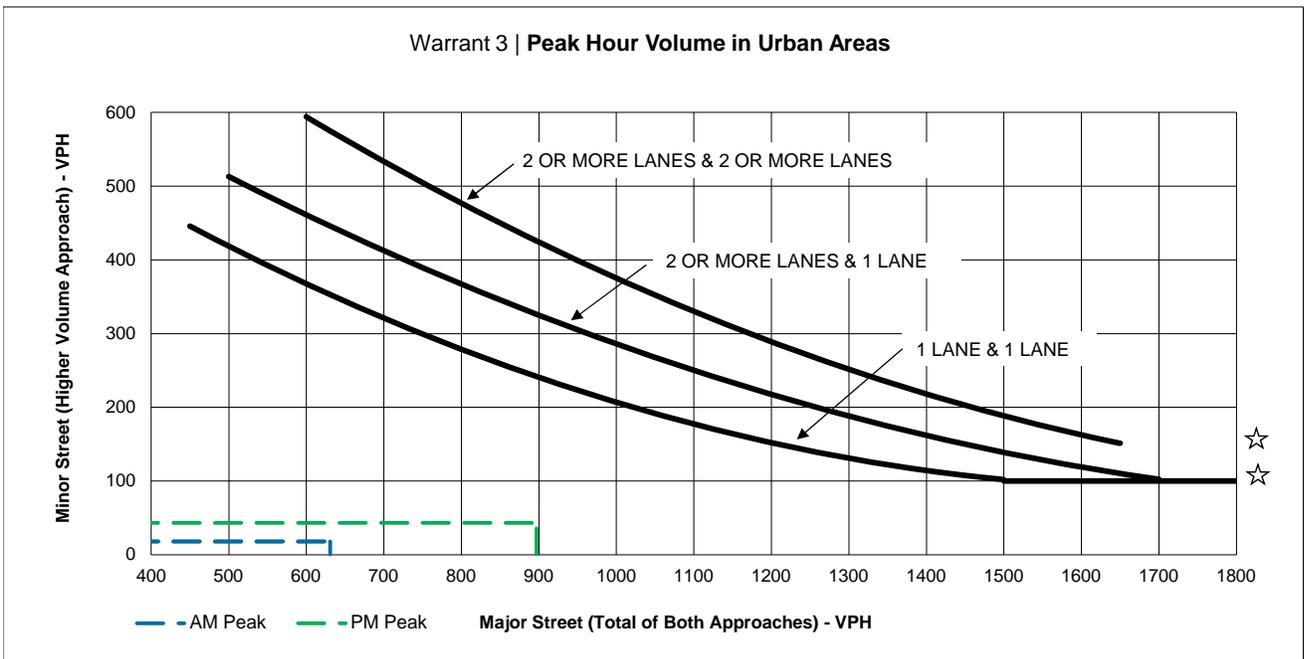
**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**

**Existing Plus Project Conditions**

Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

	Number of Lanes	
Major Approach	SR 49	2
Minor Approach	Northside Dr.	1
	AM Peak	PM Peak
Major St. Volume (both approaches):	631	897
Minor St. Volume (higher volume approach):	18	43
Warrant Met?:	<b>NO</b>	<b>NO</b>

**Volumes for higher minor street**

Fig 4C-3 (100% Option)

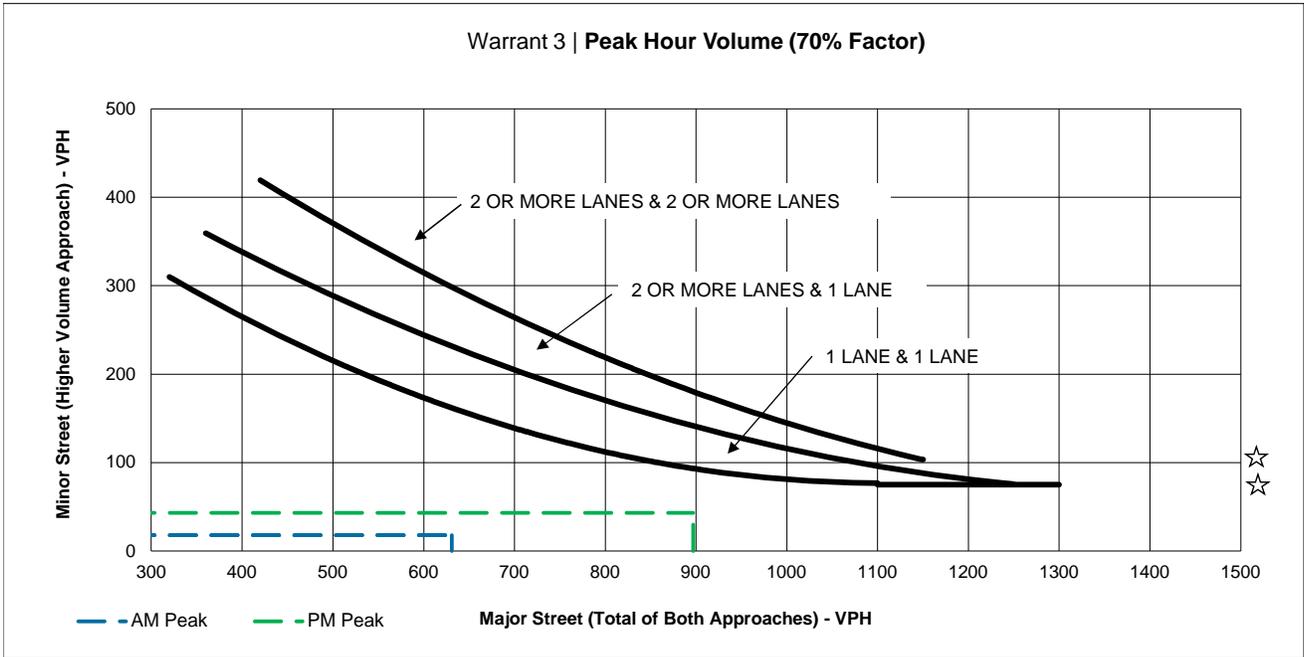
**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**

**Existing Plus Project Conditions**

Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

		Number of Lanes
Major Approach	SR 49	2
Minor Approach	Northside Dr.	1
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	631	897
Minor St. Volume (higher volume approach):	18	43
Warrant Met?:	<b>NO</b>	<b>NO</b>

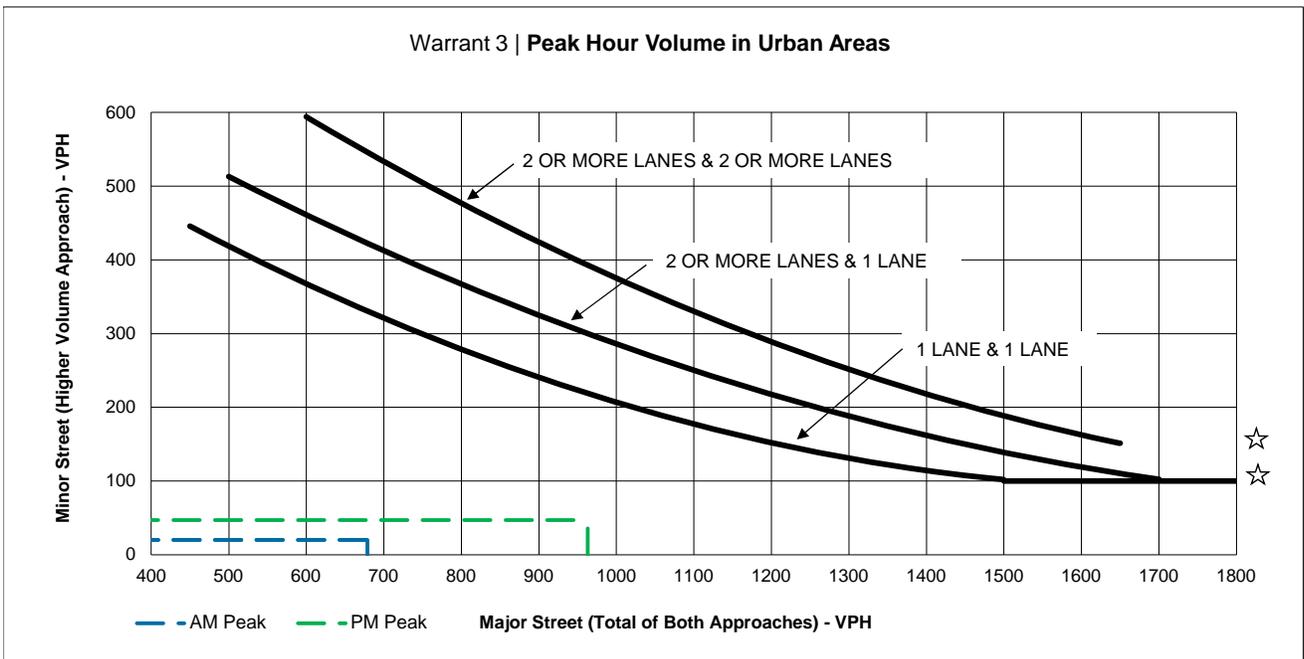
**Volumes for higher minor street**

Fig 4C-4 (70% Option)

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Near Term Plus Project Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:** 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

	Number of Lanes	
Major Approach	SR 49	2
Minor Approach	Northside Dr.	1
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	679	963
Minor St. Volume (higher volume approach):	20	47
Warrant Met?:	<b>NO</b>	<b>NO</b>

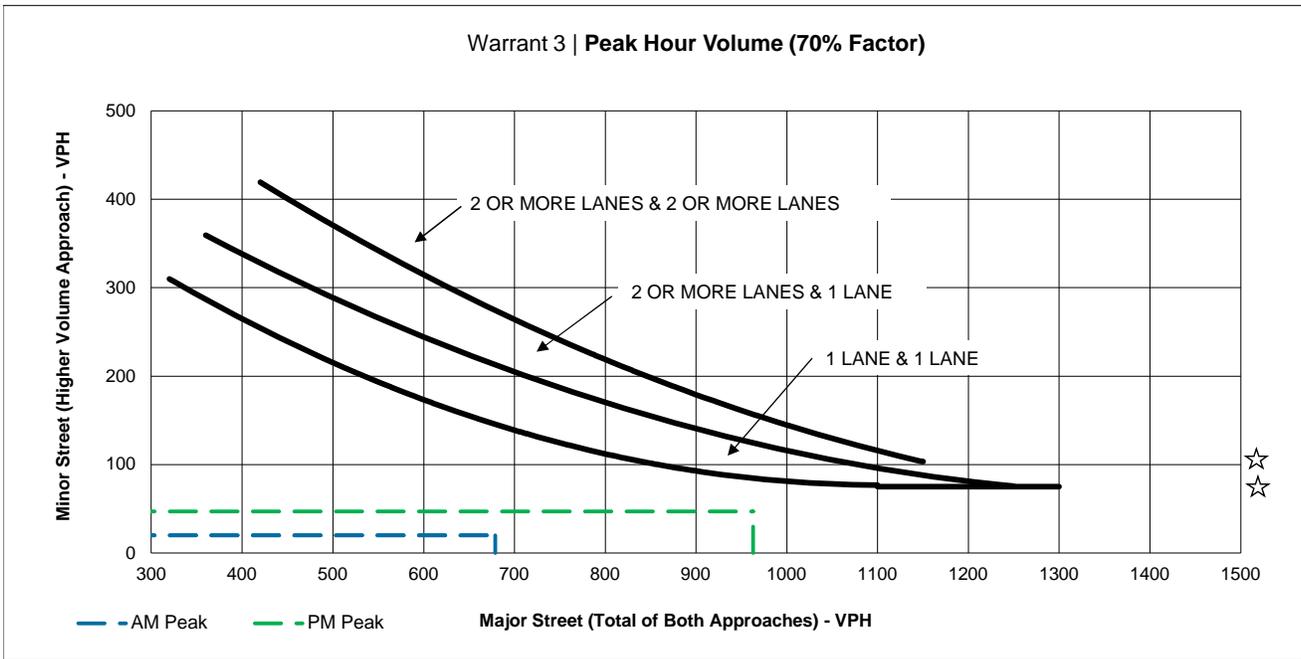
**Volumes for higher minor street**

Fig 4C-3 (100% Option)

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Near Term Plus Project Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

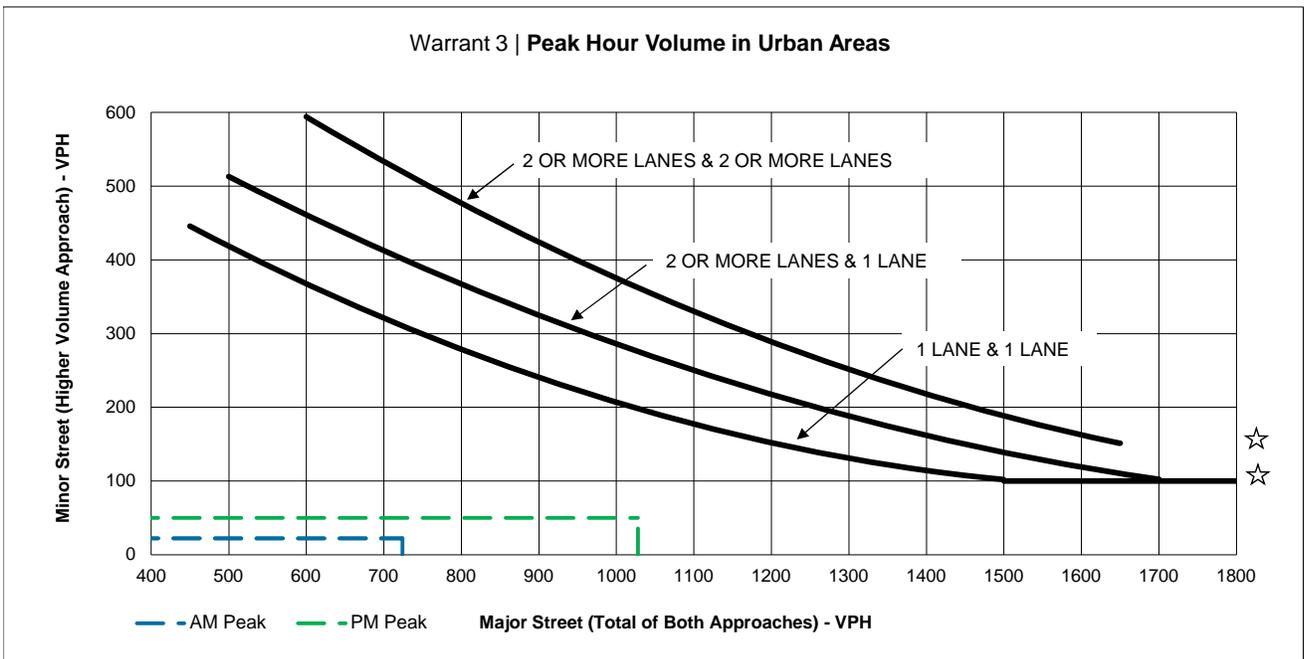
SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	Northside Dr.	2	1	
Major St. Volume (both approaches):		679	963	
Minor St. Volume (higher volume approach):		20	47	
Warrant Met?:		<b>NO</b>	<b>NO</b>	

Fig 4C-4 (70% Option)

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study  
**Cumulative Plus Project Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

	Number of Lanes	
Major Approach	SR 49	2
Minor Approach	Northside Dr.	1
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	724	1,028
Minor St. Volume (higher volume approach):	22	50
Warrant Met?:	<b>NO</b>	<b>NO</b>

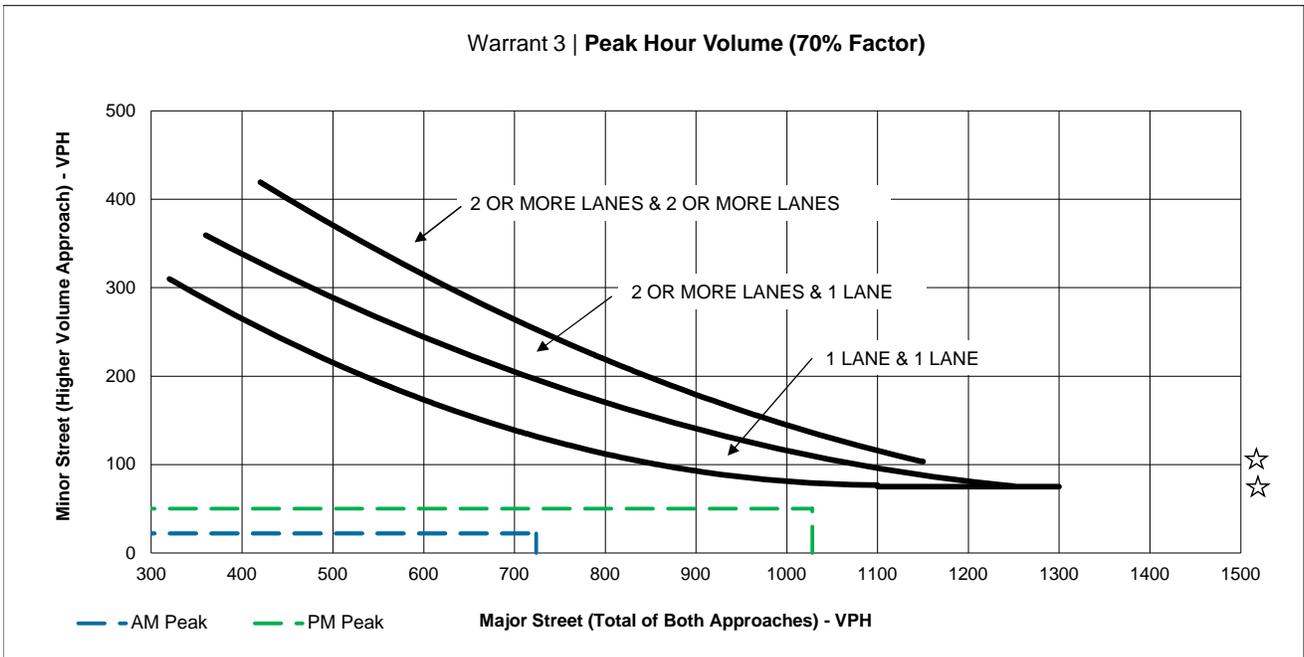
**Volumes for higher minor street**

Fig 4C-3 (100% Option)

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Cumulative Plus Project Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	Northside Dr.	2	1	
Major St. Volume (both approaches):		724	1,028	
Minor St. Volume (higher volume approach):		22	50	
Warrant Met?:		<b>NO</b>	<b>NO</b>	

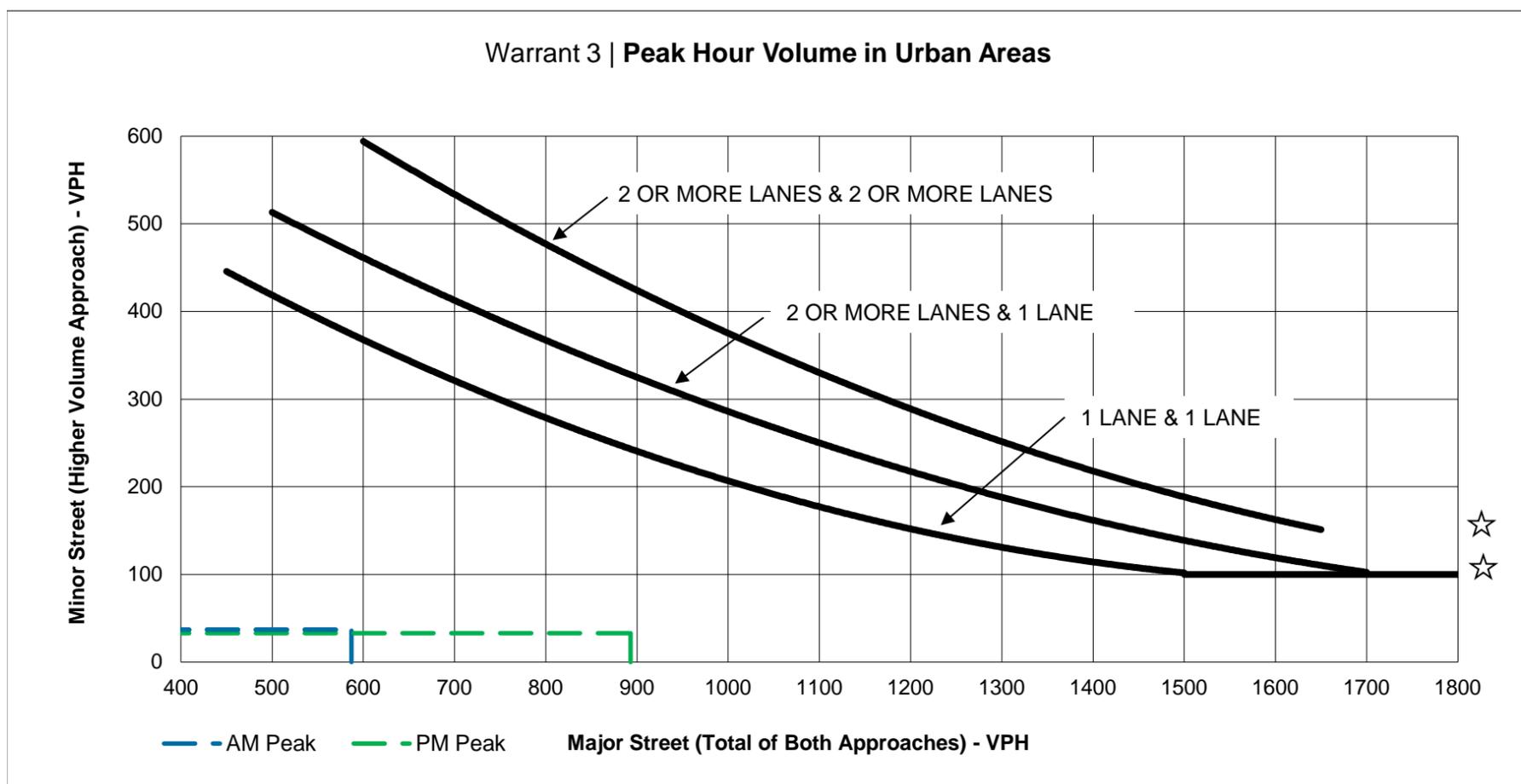
Fig 4C-4 (70% Option)

**Intersection #2: Highway 49 & Retail-Project Driveway**

**Existing Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



**NOTE:**

150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

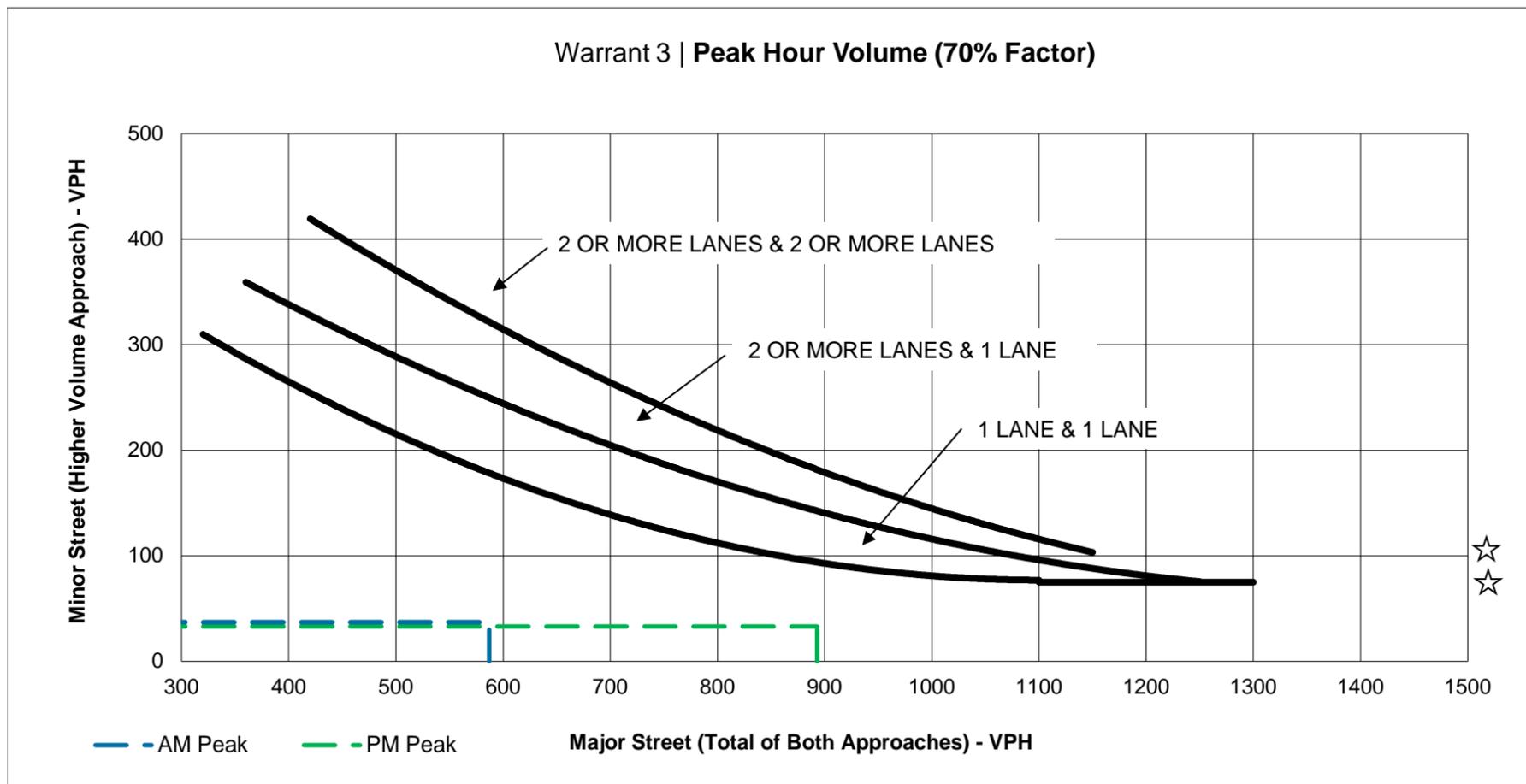
	Number of Lanes		
Major Approach	SR 49	2	
Minor Approach	Exist Retail Dr.	1	
	AM Peak	PM Peak	Volumes for higher minor street
Major St. Volume (both approaches):	587	893	
Minor St. Volume (higher volume approach):	37	33	
Warrant Met?:	No	No	

Fig 4C-3 (100% Option)

**Existing Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	Exist Retail Dr.	2	1	
Major St. Volume (both approaches):		587	893	
Minor St. Volume (higher volume approach):		37	33	
Warrant Met?:		NO	NO	

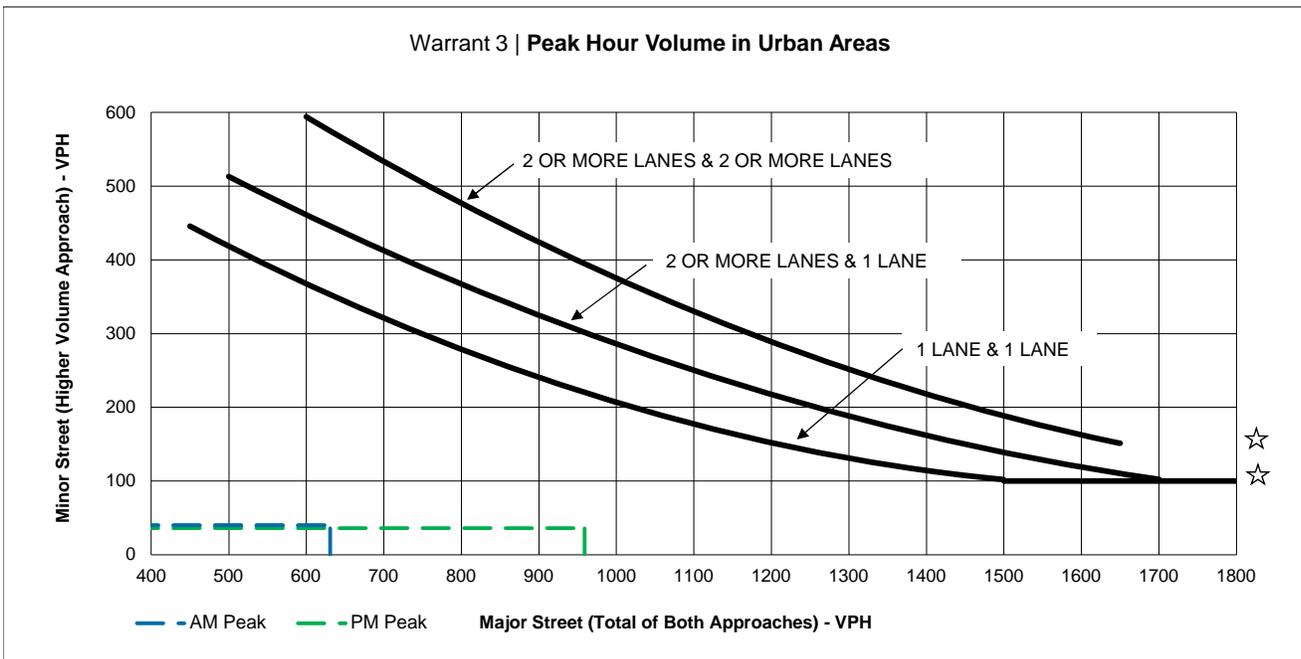
Fig 4C-4 (70% Option)

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Near Term Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:** 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

	Number of Lanes	
Major Approach	SR 49	2
Minor Approach	Exist Retail Dr.	1
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	631	959
Minor St. Volume (higher volume approach):	40	36
Warrant Met?:	<b>NO</b>	<b>NO</b>

**Volumes for higher minor street**

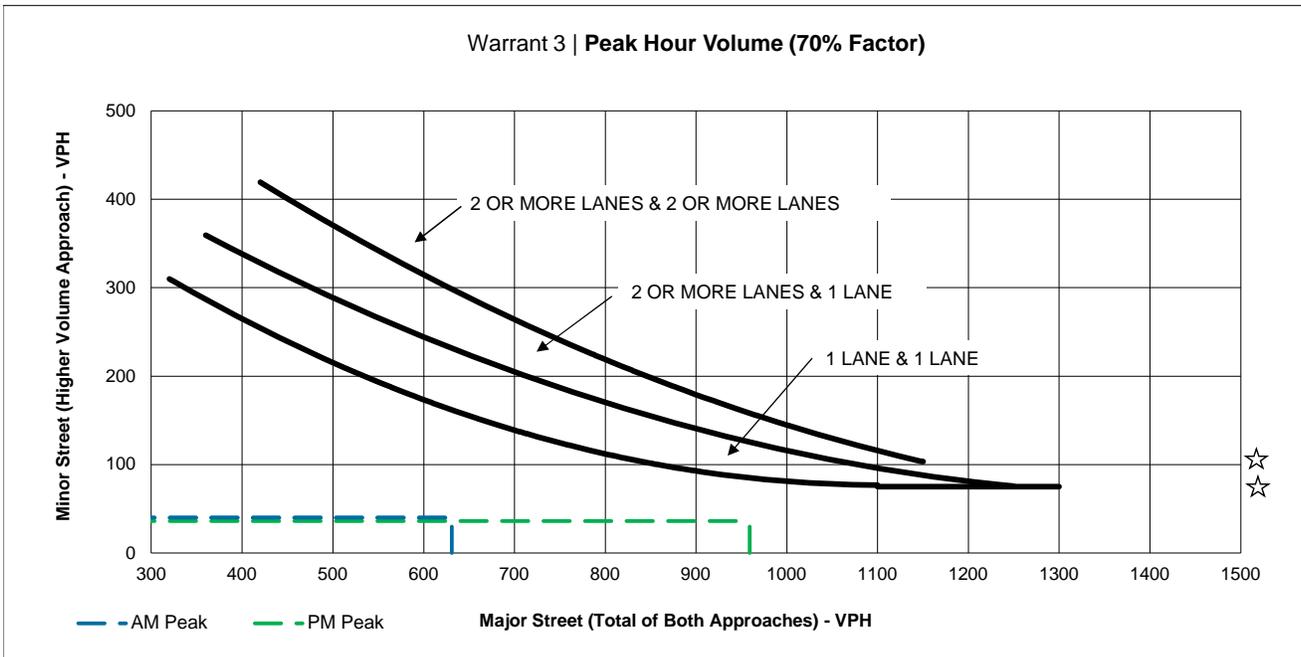
Fig 4C-3 (100% Option)

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Near Term Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	Exist Retail Dr.	2	1	
Major St. Volume (both approaches):		631	959	
Minor St. Volume (higher volume approach):		40	36	
Warrant Met?:		<b>NO</b>	<b>NO</b>	

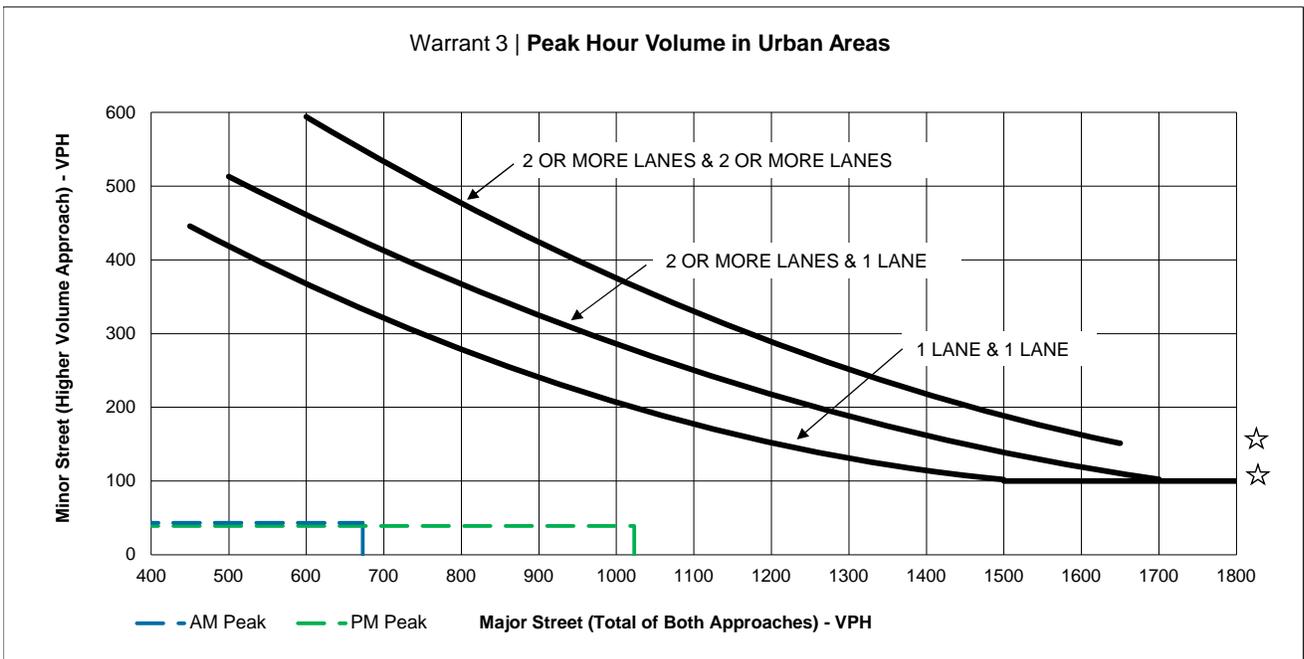
Fig 4C-4 (70% Option)

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Cumulative Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:** 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

	Number of Lanes	
Major Approach	SR 49	2
Minor Approach	Exist Retail Dr.	1
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	673	1,023
Minor St. Volume (higher volume approach):	43	39
Warrant Met?:	<b>NO</b>	<b>NO</b>

**Volumes for higher minor street**

Fig 4C-3 (100% Option)

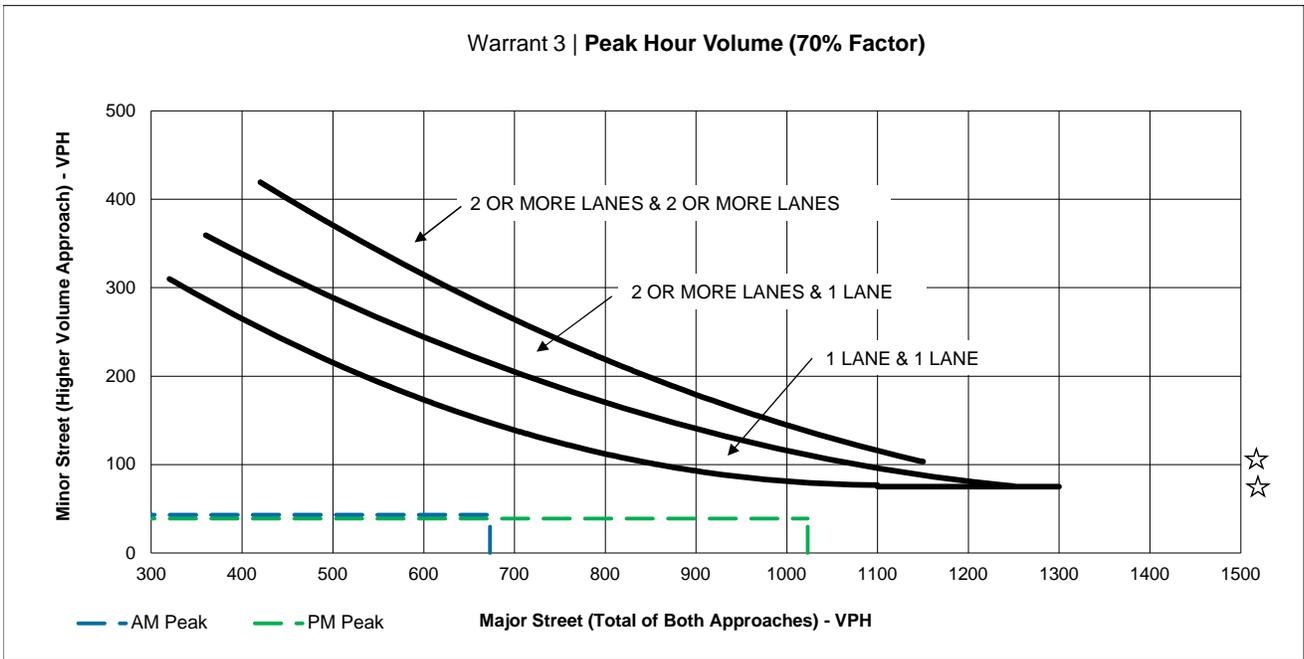
DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Cumulative Conditions**

Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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**SCENARIO (AM/PM)**

	Number of Lanes	
Major Approach	SR 49	2
Minor Approach	Exist Retail Dr.	1
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	673	1,023
Minor St. Volume (higher volume approach):	43	39
Warrant Met?:	<b>NO</b>	<b>NO</b>

**Volumes for higher minor street**

Fig 4C-4 (70% Option)

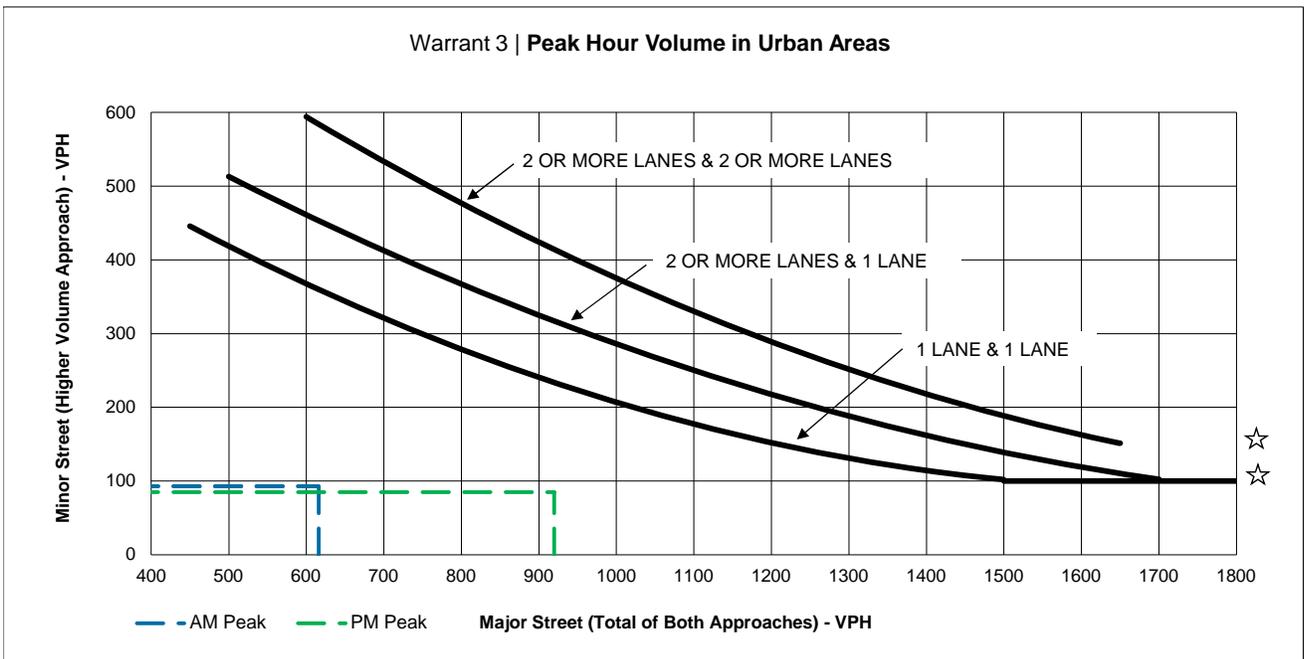
**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**

**Existing Plus Project Conditions**

Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**SCENARIO (AM/PM)**

	Number of Lanes	
Major Approach	SR 49	2
Minor Approach	Project Driveway	2
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	616	920
Minor St. Volume (higher volume approach):	93	85
Warrant Met?:	<b>NO</b>	<b>NO</b>

**Volumes for higher minor street**

Fig 4C-3 (100% Option)

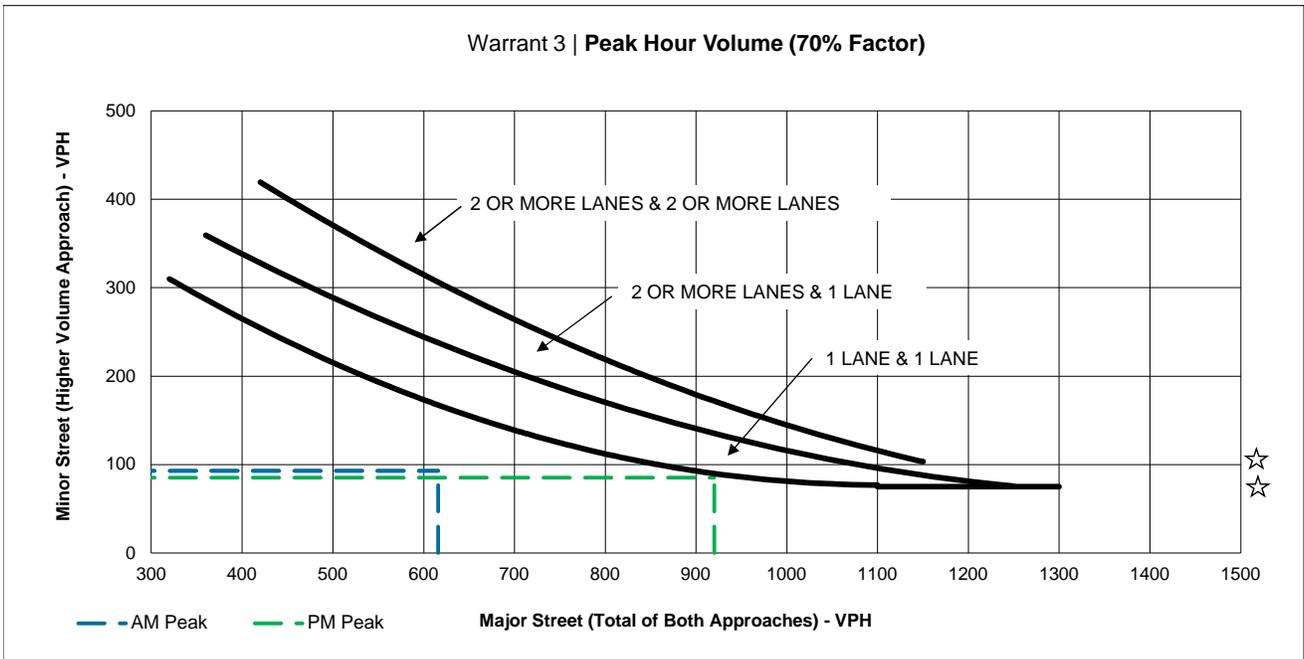
**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**

**Existing Plus Project Conditions**

Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

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**SCENARIO (AM/PM)**

		Number of Lanes
Major Approach	SR 49	2
Minor Approach	Project Driveway	2
	<b>AM Peak</b>	<b>PM Peak</b>
Major St. Volume (both approaches):	616	920
Minor St. Volume (higher volume approach):	93	85
Warrant Met?:	<b>NO</b>	<b>NO</b>

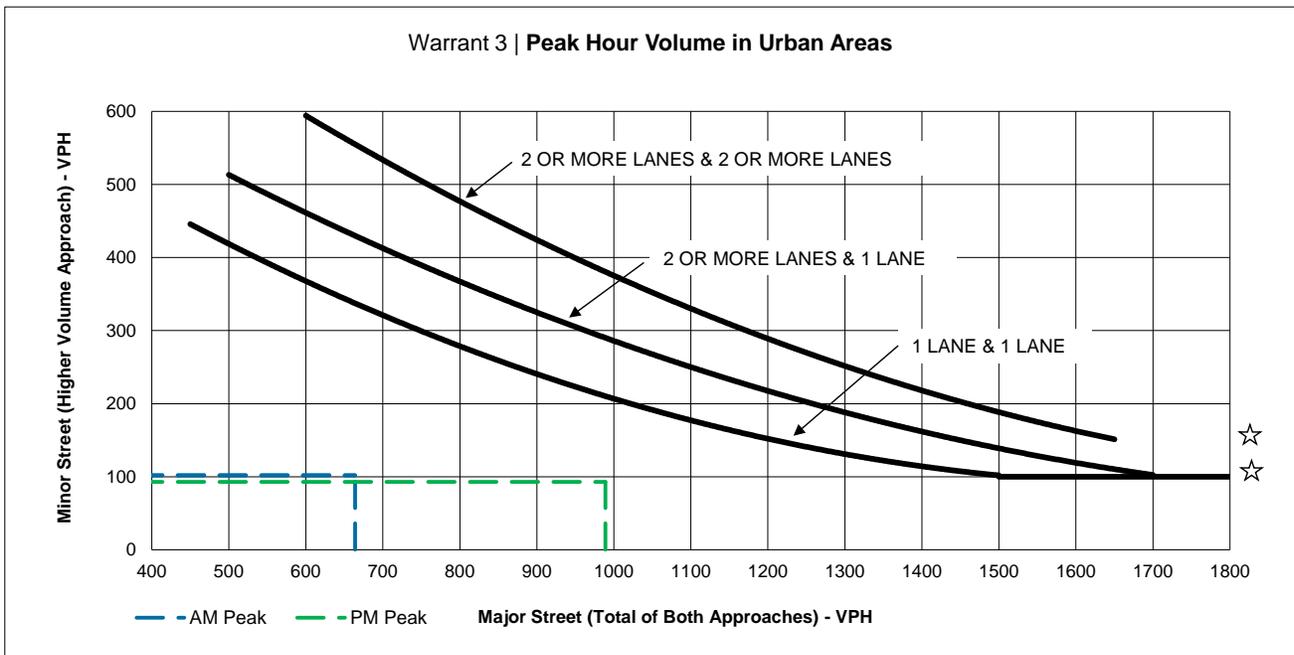
**Volumes for higher minor street**

Fig 4C-4 (70% Option)

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Near Term Plus Project Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
	AM Peak	PM Peak	
Major Approach	SR 49	2	
Minor Approach	Project Driveway	2	
Major St. Volume (both approaches):	664	989	
Minor St. Volume (higher volume approach):	102	93	
Warrant Met?:	<b>NO</b>	<b>NO</b>	

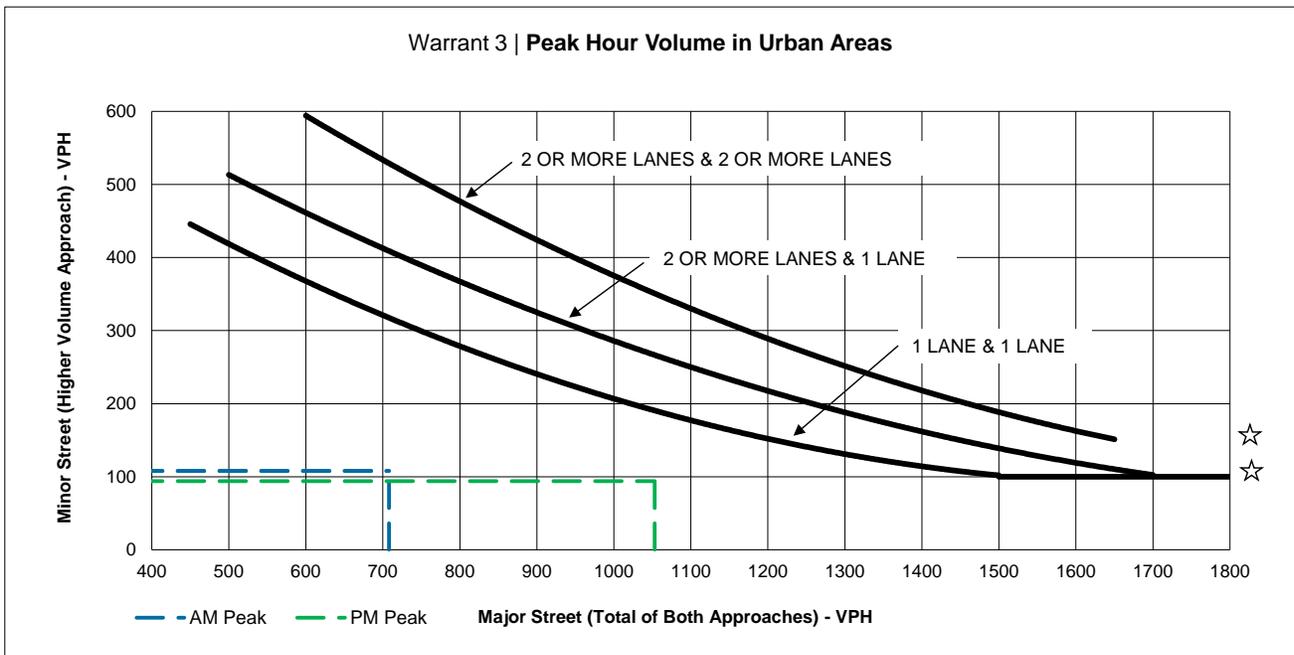
Fig 4C-3 (100% Option)



DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study  
**Cumulative Plus Project Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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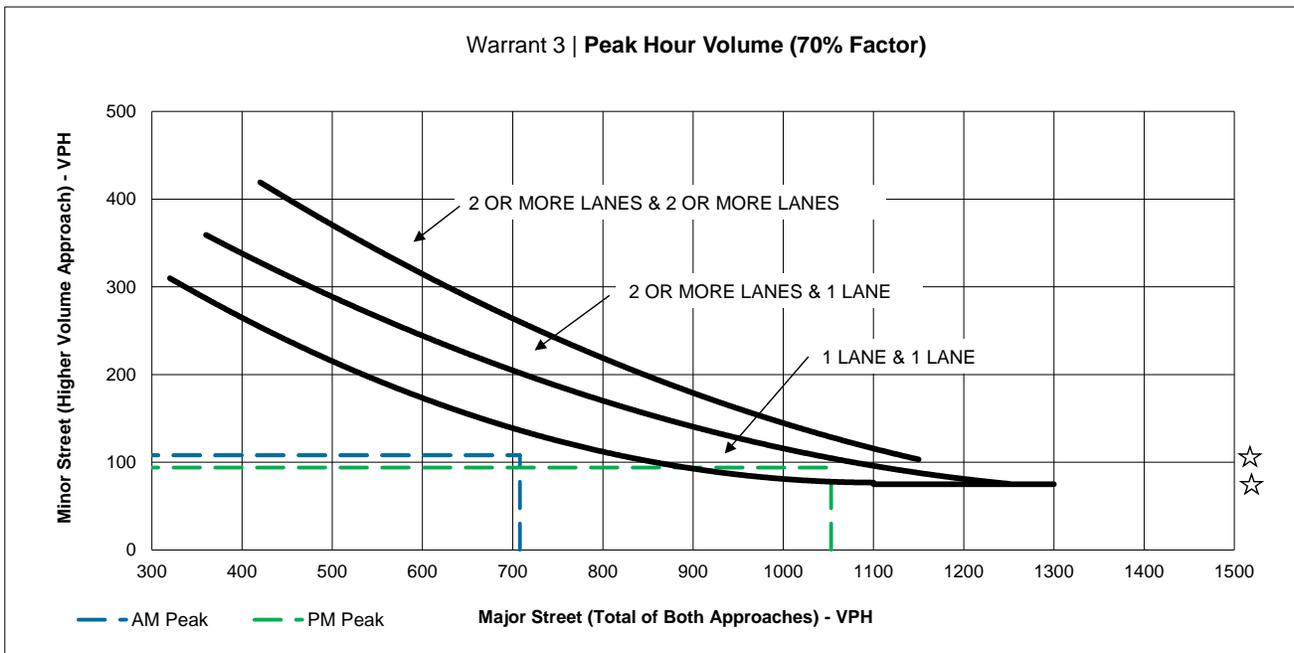
SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
Major Approach	SR 49	2	
Minor Approach	Project Driveway	2	
	AM Peak	PM Peak	
Major St. Volume (both approaches):	708	1,053	
Minor St. Volume (higher volume approach):	108	94	
Warrant Met?:	No	No	

Fig 4C-3 (100% Option)

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study  
**Cumulative Plus Project Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

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 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
Major Approach	SR 49	2	
Minor Approach	Project Driveway	2	
	AM Peak	PM Peak	
Major St. Volume (both approaches):	708	1,053	
Minor St. Volume (higher volume approach):	108	94	
Warrant Met?:	Yes	Yes	

Fig 4C-4 (70% Option)

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

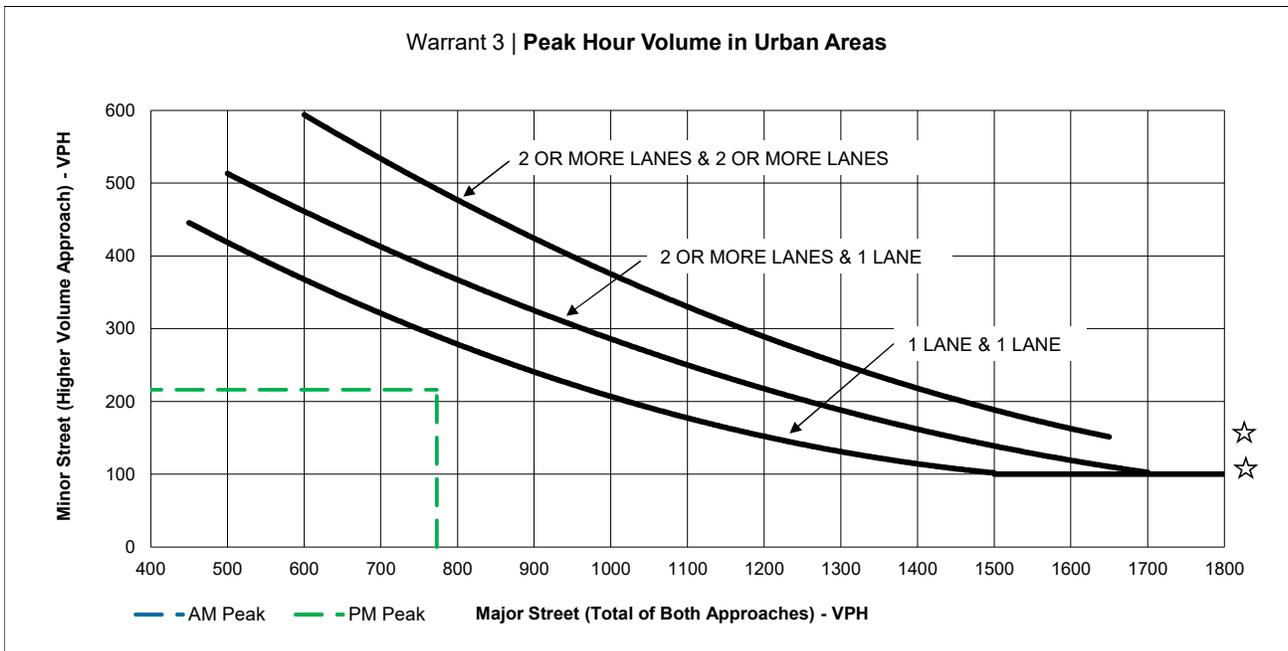
**Intersection #3: Highway 49 & Highway 193**

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Existing Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	SR 193			
		391	773	
		346	216	
		No	No	

Fig 4C-3 (100% Option)



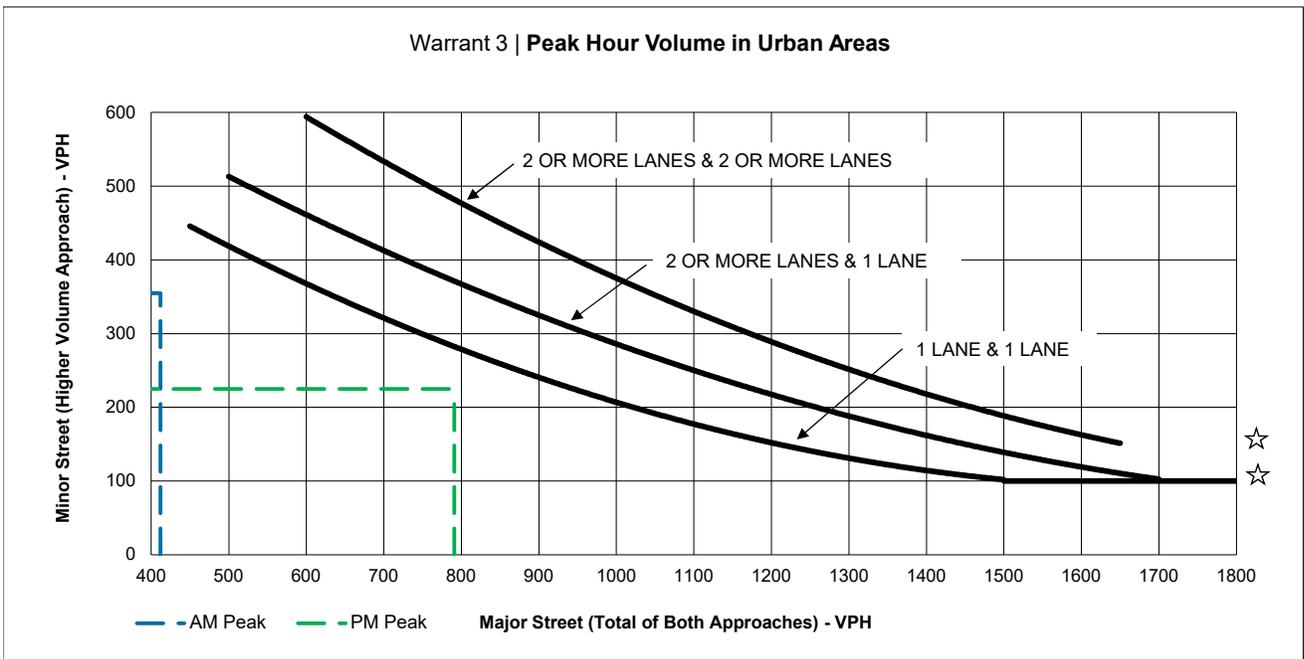
**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**

**Existing Plus Project Conditions**

Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	SR 193	2	1	
Major St. Volume (both approaches):		412	791	
Minor St. Volume (higher volume approach):		355	225	
Warrant Met?:		No	No	

Fig 4C-3 (100% Option)

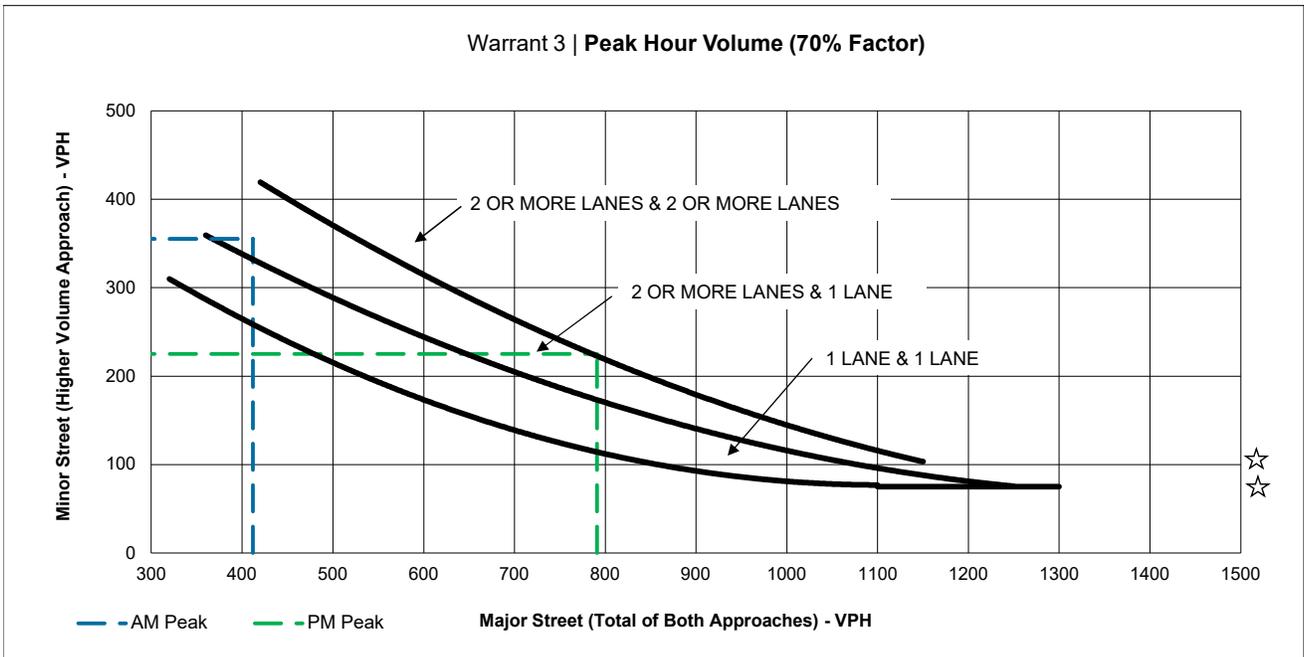
**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**

**Existing Plus Project Conditions**

Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

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SCENARIO (AM/PM)		Number of Lanes	
Major Approach	SR 49	2	
Minor Approach	SR 193	1	
	AM Peak	PM Peak	Volumes for higher minor street
Major St. Volume (both approaches):	412	791	
Minor St. Volume (higher volume approach):	355	225	
Warrant Met?:	Yes	Yes	

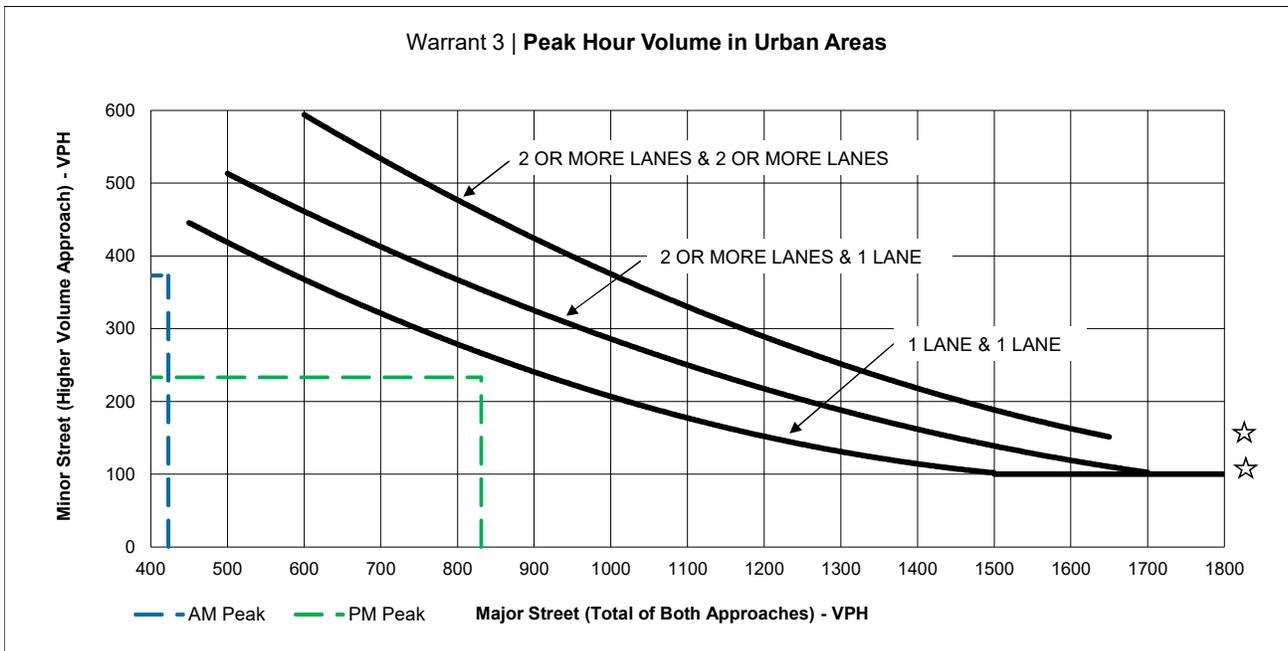
Fig 4C-4 (70% Option)

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Near Term Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	SR 193			
		423	831	
		373	233	
		No	No	

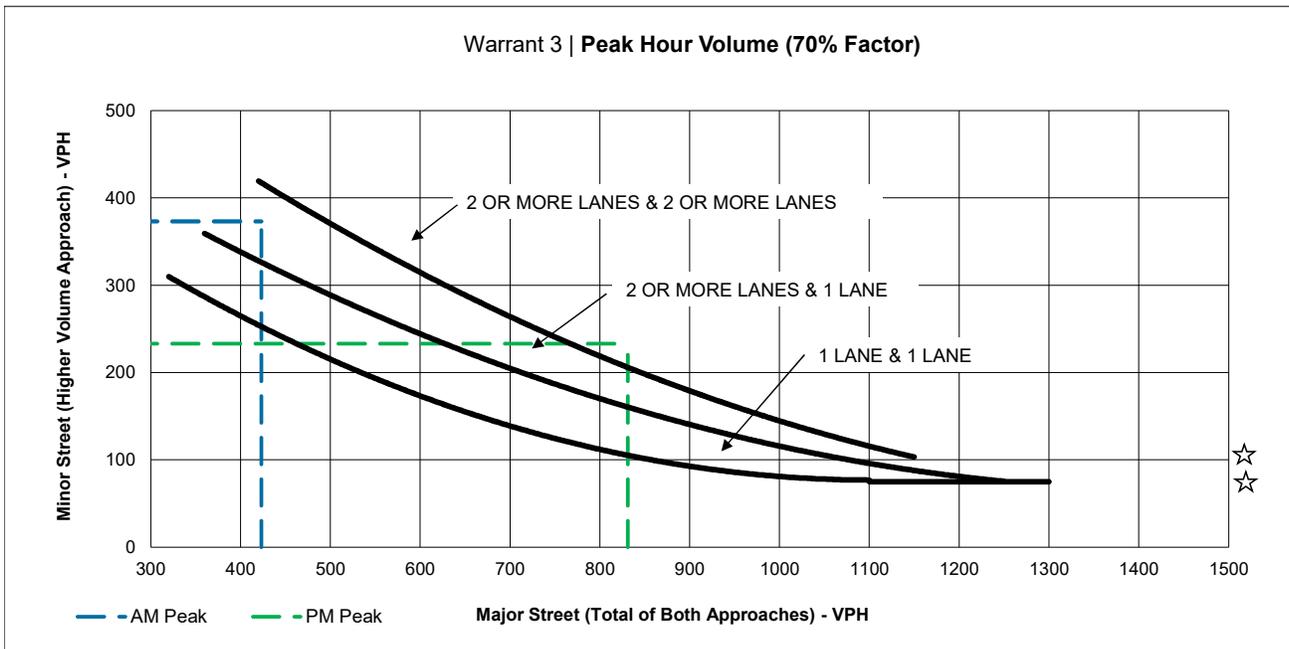
Fig 4C-3 (100% Option)

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Near Term Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

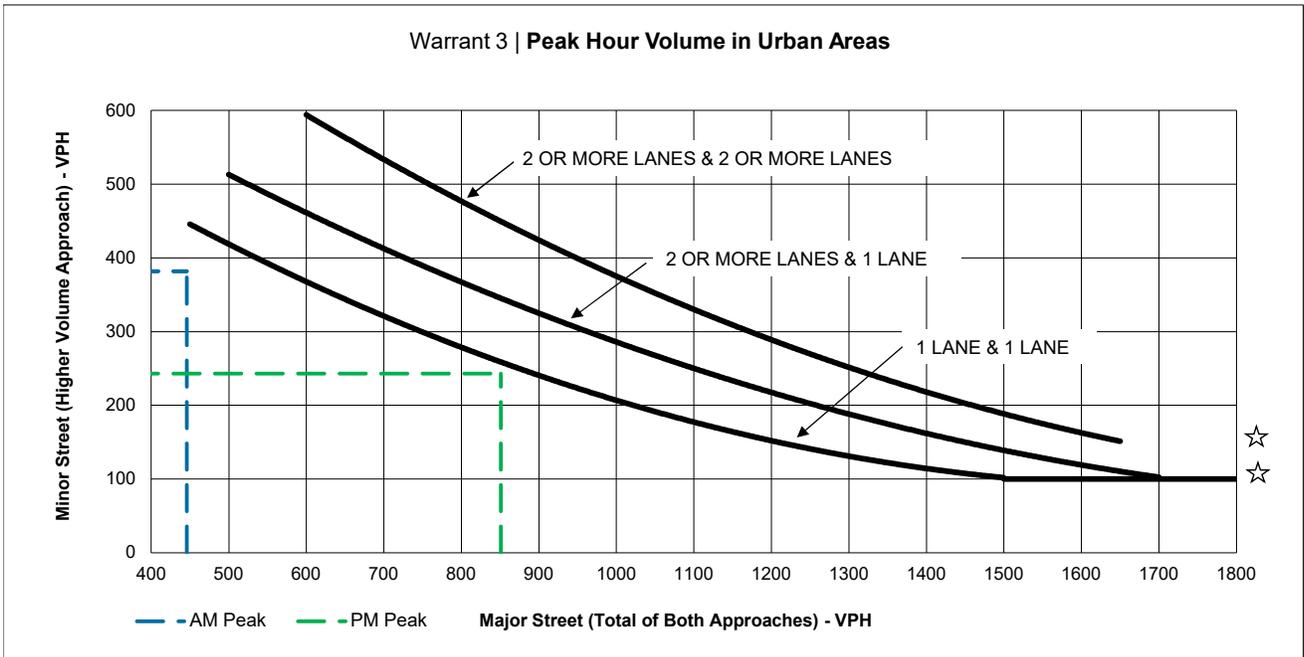
SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	SR 193	423	831	Warrant Met?: <b>Yes</b>
		373	233	
		<b>Yes</b>	<b>Yes</b>	

Fig 4C-4 (70% Option)

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Near Term Plus Project Conditions**  
**Signal Warrant 3: Peak Hour**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

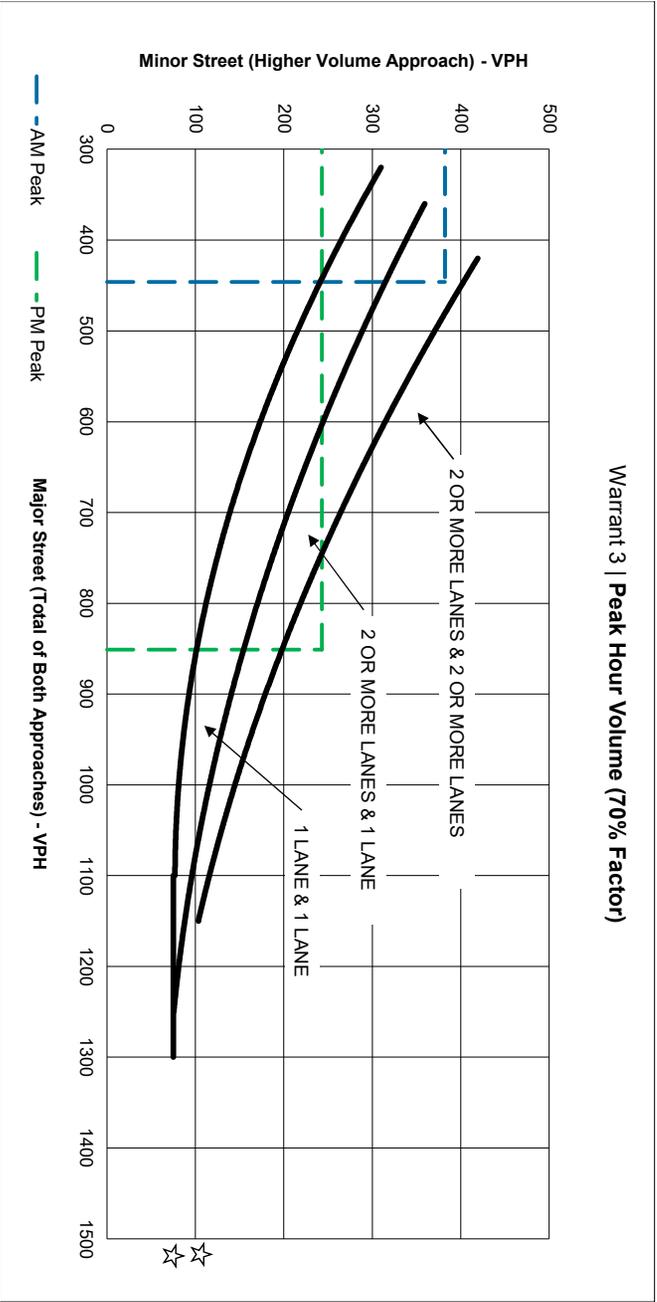
SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
Major Approach	SR 49	2	
Minor Approach	SR 193	1	
	AM Peak	PM Peak	
Major St. Volume (both approaches):	446	851	
Minor St. Volume (higher volume approach):	382	243	
Warrant Met?:	No	No	

Fig 4C-3 (100% Option)

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study  
**Near Term Plus Project Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)		Number of Lanes	
Major Approach	SR 49	2	
Minor Approach	SR 193	1	
Major St. Volume (both approaches):	AM Peak	PM Peak	Volumes for higher minor street
Minor St. Volume (higher volume approach):	446	851	
Warrant Met?:	382	243	
	Yes	Yes	

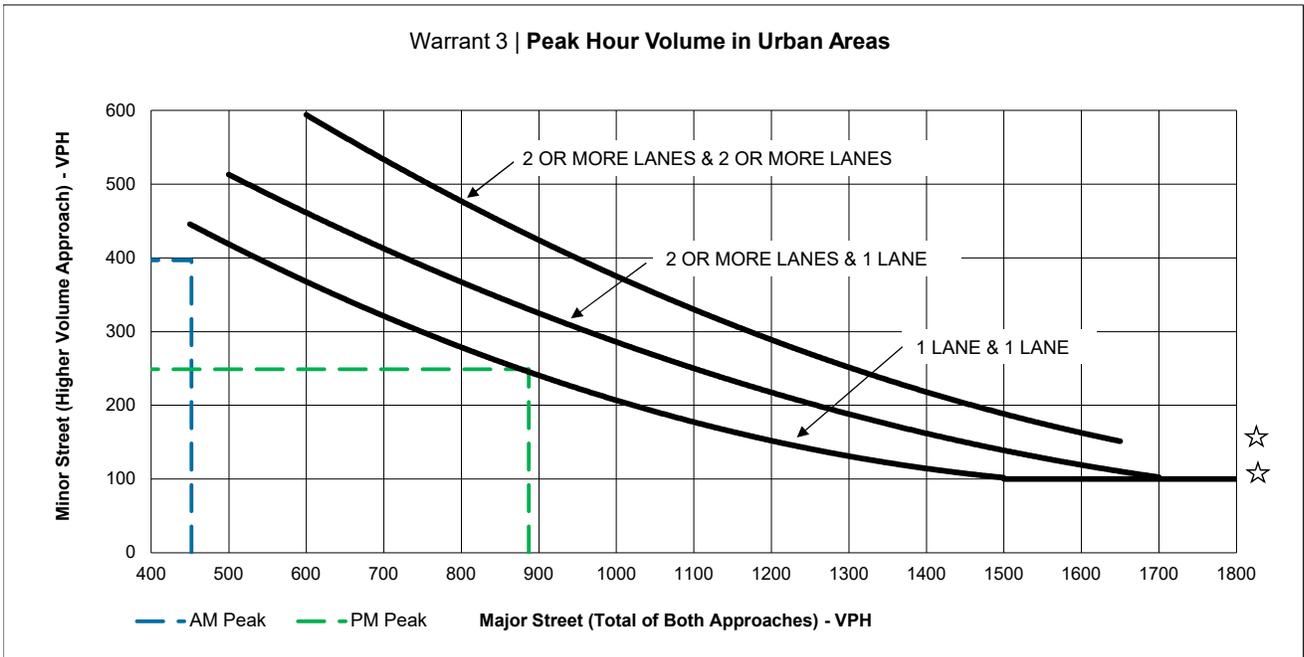
Fig 4C-4 (70% Option)

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Cumulative Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:** 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	SR 193	2	1	
Major St. Volume (both approaches):		452	887	
Minor St. Volume (higher volume approach):		397	249	
Warrant Met?:		No	No	

Fig 4C-3 (100% Option)

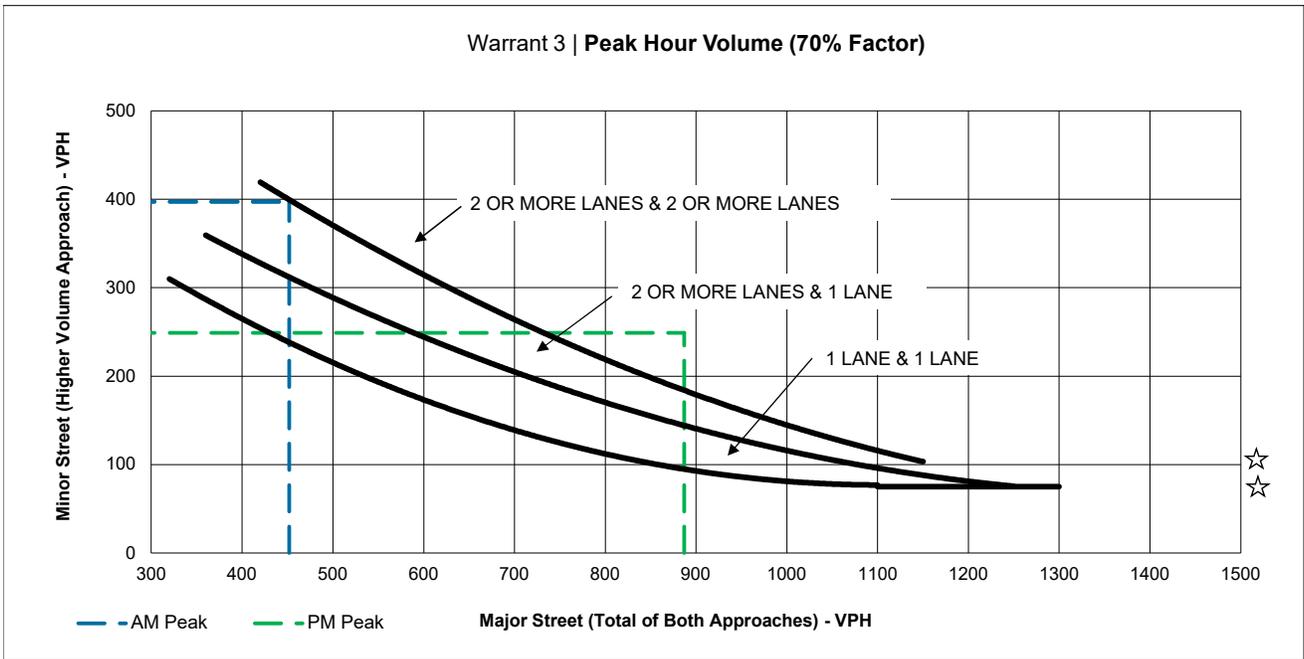
DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

**Cumulative Conditions**

Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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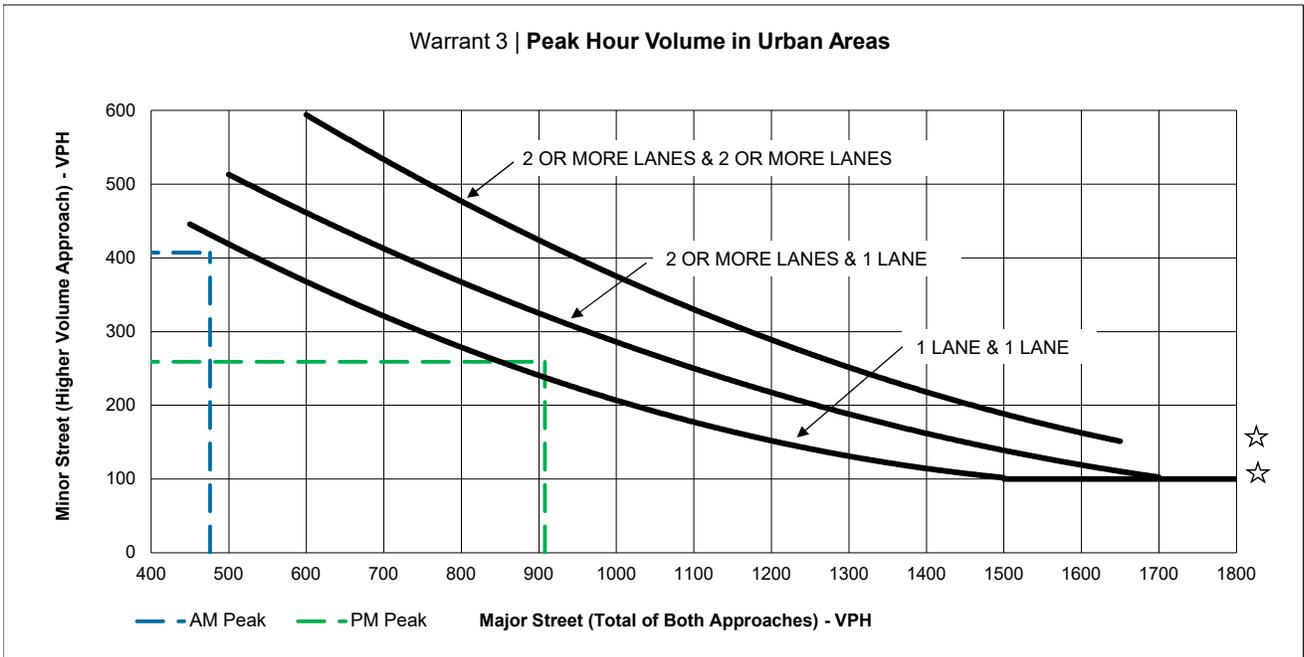
SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
	AM Peak	PM Peak	
Major Approach	SR 49	2	
Minor Approach	SR 193	1	
Major St. Volume (both approaches):	452	887	
Minor St. Volume (higher volume approach):	397	249	
Warrant Met?:	Yes	Yes	

Fig 4C-4 (70% Option)

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study  
**Cumulative Plus Project Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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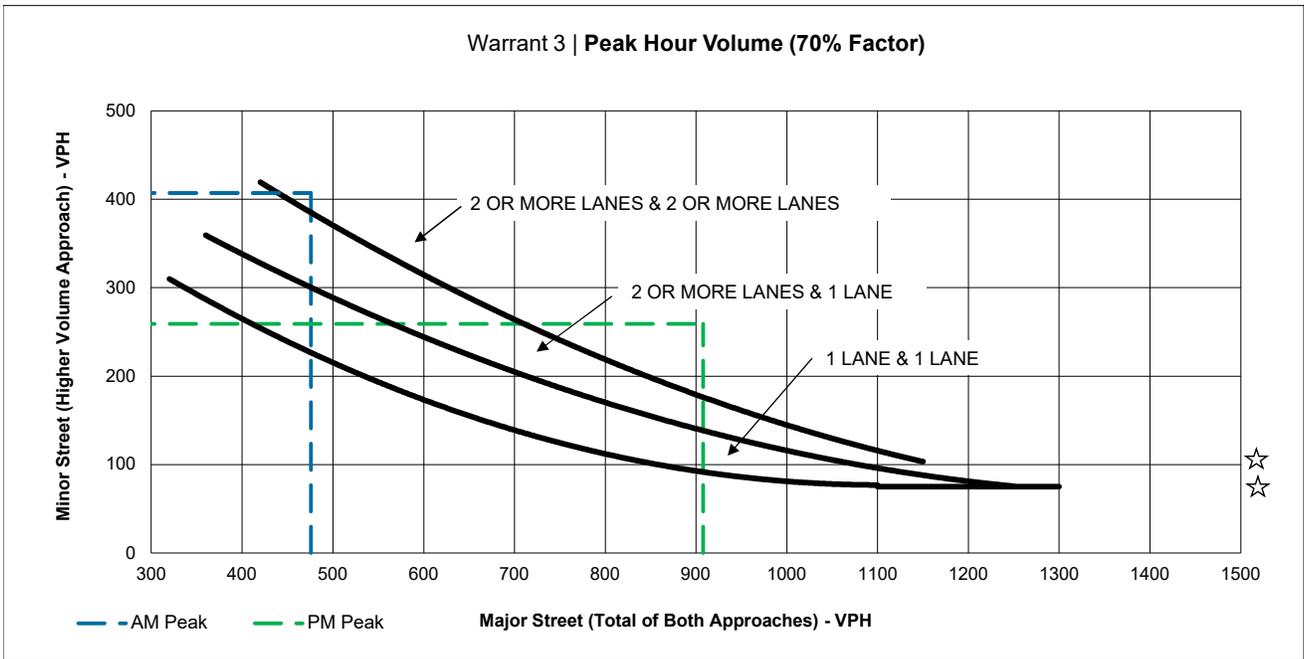
SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 49	SR 193	2	1	
Major St. Volume (both approaches):		476	908	
Minor St. Volume (higher volume approach):		407	259	
Warrant Met?:		No	No	

Fig 4C-3 (100% Option)

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study  
**Cumulative Plus Project Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
	AM Peak	PM Peak	
Major Approach	SR 49	2	
Minor Approach	SR 193	1	
Major St. Volume (both approaches):	476	908	
Minor St. Volume (higher volume approach):	407	259	
Warrant Met?:	Yes	Yes	

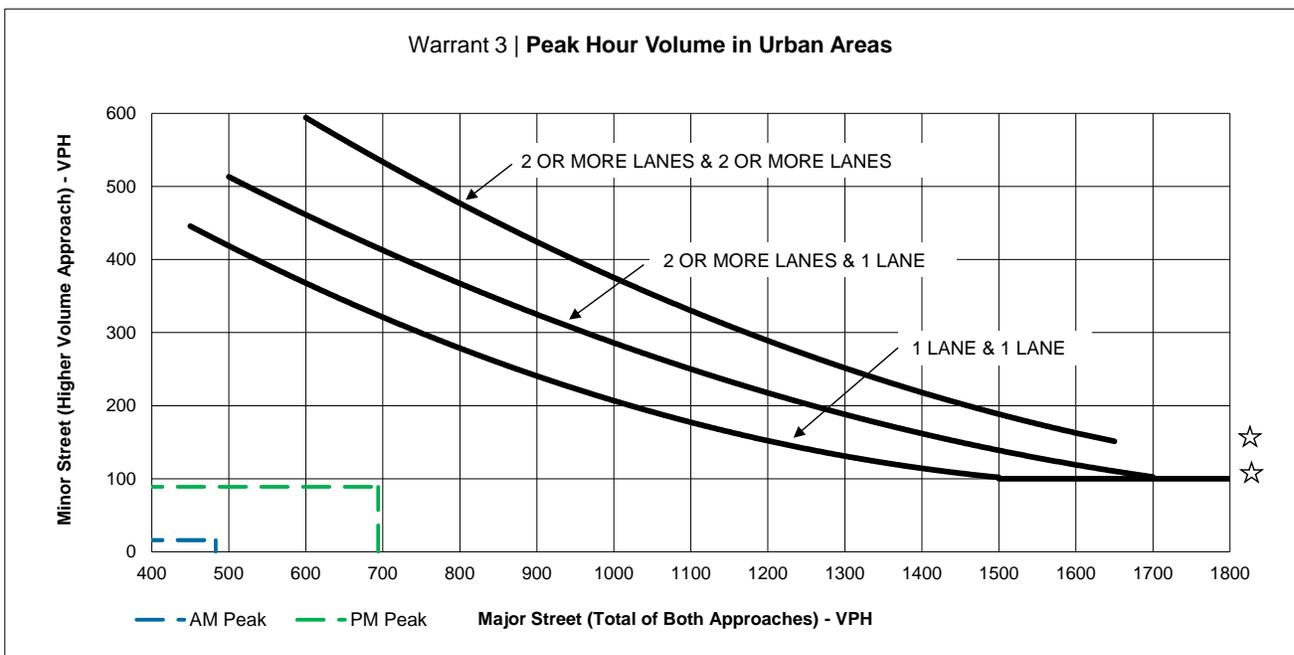
Fig 4C-4 (70% Option)

**Intersection #4: Highway 193 & Ellinghouse Drive-Project Driveway**

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Existing Conditions**  
**Signal Warrant 3: Peak Hour**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

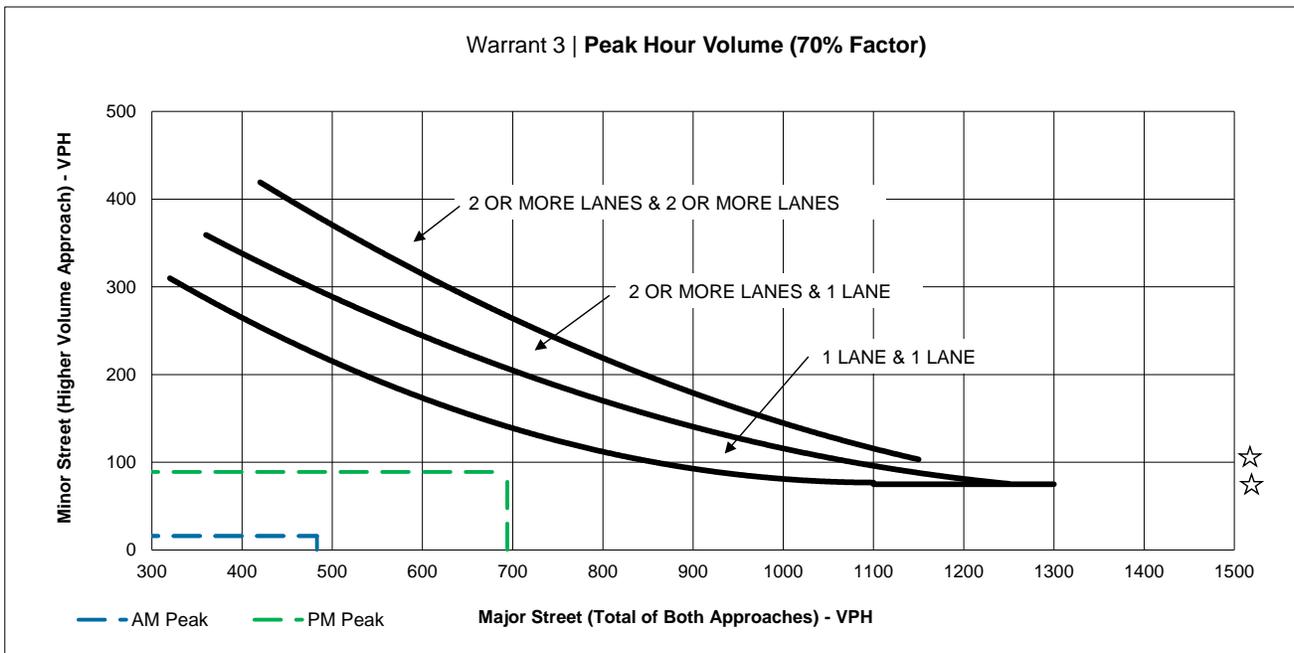
SCENARIO (AM/PM)		Number of Lanes		Volumes for higher minor street
Major Approach	Minor Approach	AM Peak	PM Peak	
SR 193	Ellinghouse Dr.	2	1	
Major St. Volume (both approaches):		483	694	
Minor St. Volume (higher volume approach):		16	89	
Warrant Met?:		No	No	

Fig 4C-3 (100% Option)

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Existing Conditions**  
**Signal Warrant 3: Peak Hour**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

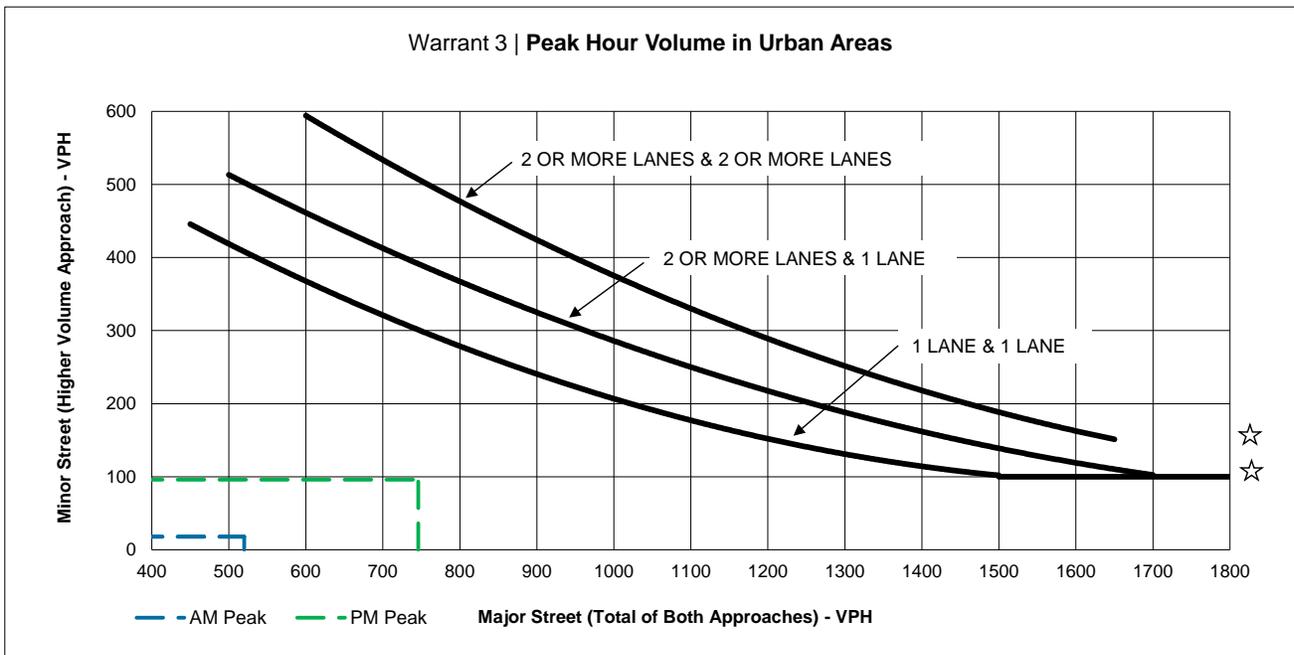
SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
	AM Peak	PM Peak	
Major Approach	SR 193	2	
Minor Approach	Ellinghouse Dr.	1	
Major St. Volume (both approaches):	483	694	
Minor St. Volume (higher volume approach):	16	89	
Warrant Met?:	NO	NO	

Fig 4C-4 (70% Option)

**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Near Term Conditions**  
**Signal Warrant 3: Peak Hour**

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)		Number of Lanes	
Major Approach	SR 193	2	
Minor Approach	Ellinghouse Dr.	1	
	AM Peak	PM Peak	Volumes for higher minor street
Major St. Volume (both approaches):	520	746	
Minor St. Volume (higher volume approach):	18	96	
Warrant Met?:	<b>NO</b>	<b>NO</b>	

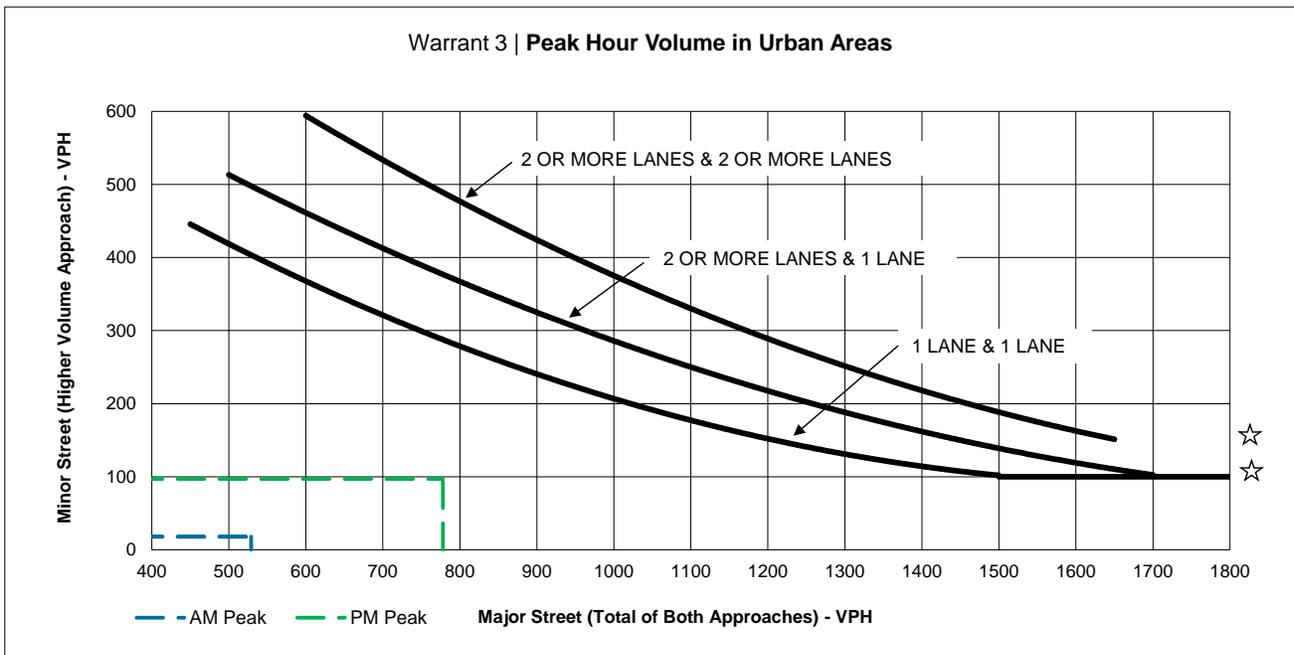
Fig 4C-3 (100% Option)



DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study  
**Cumulative Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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SCENARIO (AM/PM)		Number of Lanes	
Major Approach	SR 193	2	
Minor Approach	Ellinghouse Dr.	1	
	AM Peak	PM Peak	Volumes for higher minor street
Major St. Volume (both approaches):	529	778	
Minor St. Volume (higher volume approach):	18	97	
Warrant Met?:	<b>NO</b>	<b>NO</b>	

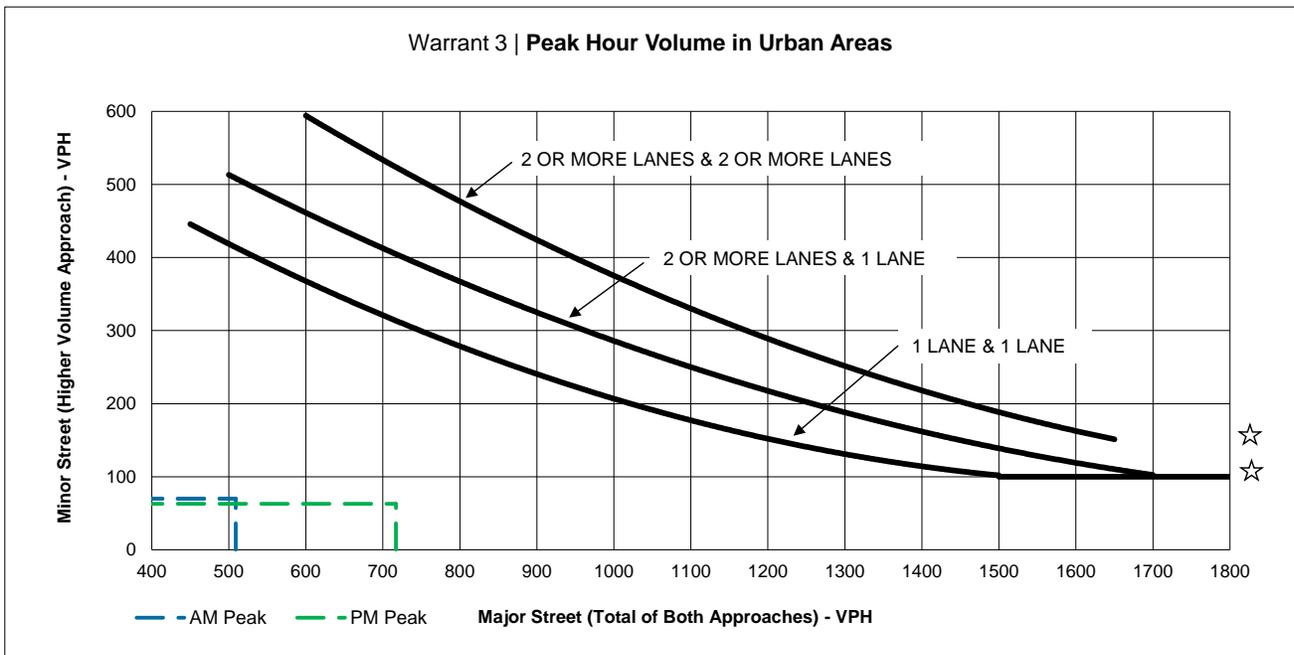
Fig 4C-3 (100% Option)



**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Existing Plus Project Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



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 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)		Number of Lanes	
Major Approach	SR 193	2	
Minor Approach	Ellinghouse-Prj. Dr.	2	
	AM Peak	PM Peak	Volumes for higher minor street
Major St. Volume (both approaches):	509	717	
Minor St. Volume (higher volume approach):	70	63	
Warrant Met?:	NO	NO	

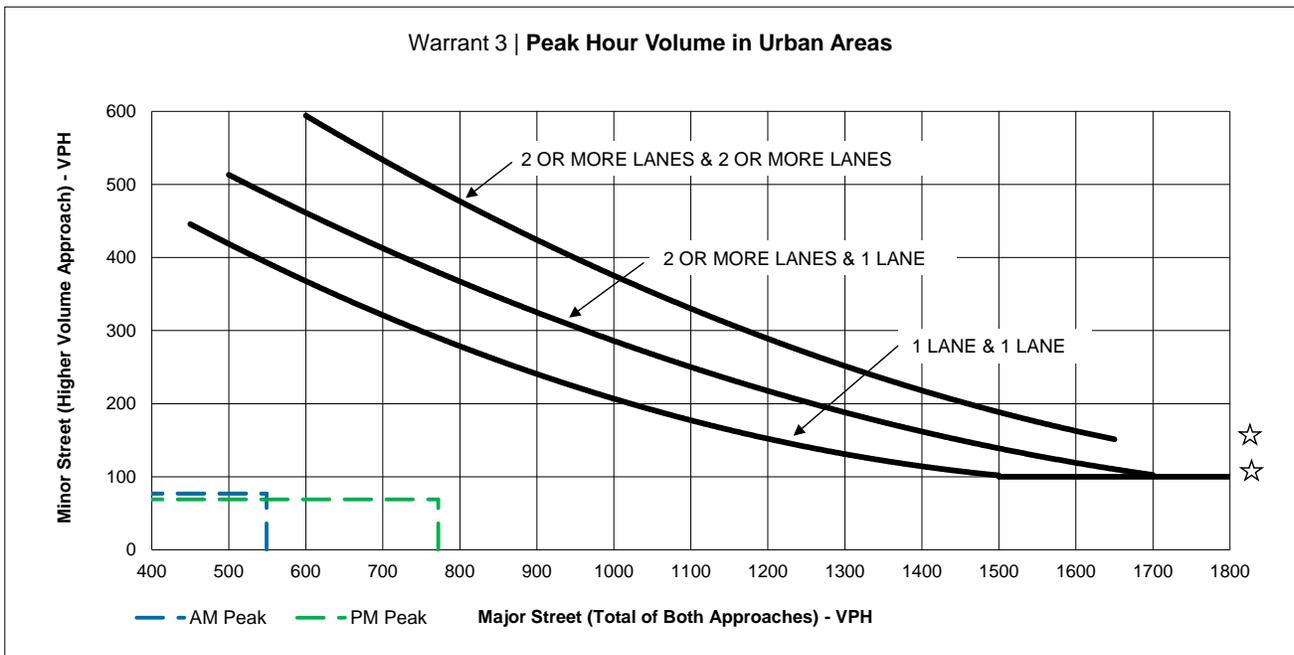
Fig 4C-3 (100% Option)



**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Near Term Plus Project Conditions**  
Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
	AM Peak	PM Peak	
Major Approach	SR 193	2	
Minor Approach	Ellinghouse-Prj. Dr.	2	
Major St. Volume (both approaches):	549	772	
Minor St. Volume (higher volume approach):	77	69	
Warrant Met?:	NO	NO	

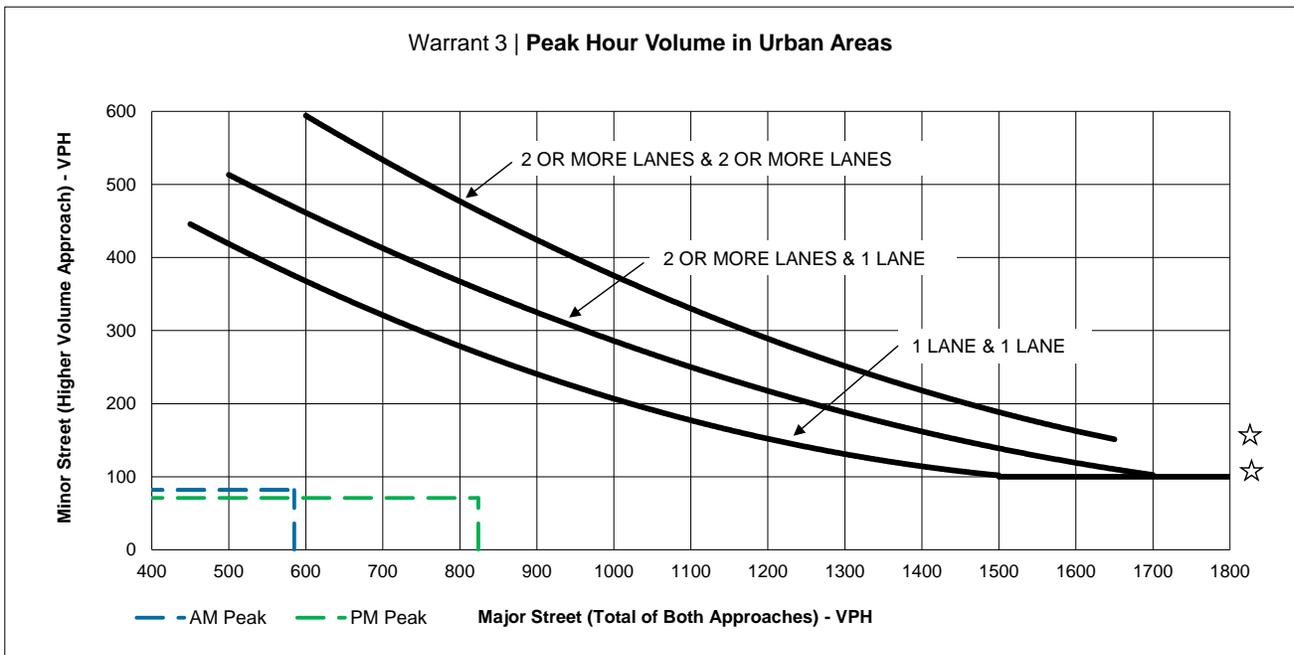
Fig 4C-3 (100% Option)



**DR22-0007 Cool Station**  
**Automobile - based Commercial Project**  
**Exhibit K Traffic Analysis Study**  
**Cumulative Plus Project Conditions**  
 Signal Warrant 3: Peak Hour

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

\* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ **NOTE:**  
 150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Number of Lanes		Volumes for higher minor street
	AM Peak	PM Peak	
Major Approach	SR 193	2	
Minor Approach	Ellinghouse-Prj. Dr.	2	
Major St. Volume (both approaches):	585	824	
Minor St. Volume (higher volume approach):	82	71	
Warrant Met?:	NO	NO	

Fig 4C-3 (100% Option)



## Attachment C: Synchro LOS Results

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Existing Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↙		↕		↘↙	↕
Traffic Vol, veh/h	10	7	397	16	3	171
Future Vol, veh/h	10	7	397	16	3	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	18	18	3	3	12	12
Mvmt Flow	11	8	432	17	3	186

Major/Minor	Minor1	Major1	Major2	Major3	Major4
Conflicting Flow All	633	441	0	0	449
Stage 1	441	-	-	-	-
Stage 2	192	-	-	-	-
Critical Hdwy	6.58	6.38	-	-	4.22
Critical Hdwy Stg 1	5.58	-	-	-	-
Critical Hdwy Stg 2	5.58	-	-	-	-
Follow-up Hdwy	3.662	3.462	-	-	2.308
Pot Cap-1 Maneuver	419	584	-	-	1060
Stage 1	616	-	-	-	-
Stage 2	804	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	418	584	-	-	1060
Mov Cap-2 Maneuver	501	-	-	-	-
Stage 1	616	-	-	-	-
Stage 2	802	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	532	1060
HCM Lane V/C Ratio	-	-	0.035	0.003
HCM Control Delay (s)	-	-	12	8.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Existing Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↗	↖	↗	↖		↖	↗
Traffic Vol, veh/h	25	0	12	0	0	0	17	388	0	0	179	3
Future Vol, veh/h	25	0	12	0	0	0	17	388	0	0	179	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	4	4	2	2	13	13
Mvmt Flow	27	0	13	0	0	0	18	422	0	0	195	3

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	655	655	197	661	656	422	198	0	0	422	0	0
Stage 1	197	197	-	458	458	-	-	-	-	-	-	-
Stage 2	458	458	-	203	198	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	379	386	844	376	385	632	1363	-	-	1137	-	-
Stage 1	805	738	-	583	567	-	-	-	-	-	-	-
Stage 2	583	567	-	799	737	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	375	381	844	367	380	632	1363	-	-	1137	-	-
Mov Cap-2 Maneuver	375	381	-	367	380	-	-	-	-	-	-	-
Stage 1	795	738	-	575	560	-	-	-	-	-	-	-
Stage 2	575	560	-	787	737	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.6	0	0.3	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1363	-	-	457	-	-	1137	-	-
HCM Lane V/C Ratio	0.014	-	-	0.088	-	-	-	-	-
HCM Control Delay (s)	7.7	-	-	13.6	0	0	0	-	-
HCM Lane LOS	A	-	-	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	-	-	0	-	-

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Automobile - based Commercial Project  
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HCM 6th AWSC

Existing Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	8	7	5	61	30	255	16	148	22	98	100	7
Future Vol, veh/h	8	7	5	61	30	255	16	148	22	98	100	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	5	5	5	3	3	3	8	8	8	11	11	11
Mvmt Flow	8	7	5	64	31	266	17	154	23	102	104	7
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	9.7	10.9	11	10.8
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	40%	67%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	35%	33%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	25%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	16	148	22	20	91	255	98	100	7
LT Vol	16	0	0	8	61	0	98	0	0
Through Vol	0	148	0	7	30	0	0	100	0
RT Vol	0	0	22	5	0	255	0	0	7
Lane Flow Rate	17	154	23	21	95	266	102	104	7
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.032	0.272	0.036	0.039	0.164	0.385	0.194	0.184	0.011
Departure Headway (Hd)	6.858	6.351	5.641	6.702	6.247	5.213	6.852	6.345	5.635
Convergence, Y/N	Yes								
Cap	522	566	634	534	575	691	524	566	635
Service Time	4.596	4.088	3.378	4.448	3.977	2.943	4.588	4.081	3.371
HCM Lane V/C Ratio	0.033	0.272	0.036	0.039	0.165	0.385	0.195	0.184	0.011
HCM Control Delay	9.8	11.5	8.6	9.7	10.2	11.2	11.2	10.5	8.4
HCM Lane LOS	A	B	A	A	B	B	B	B	A
HCM 95th-tile Q	0.1	1.1	0.1	0.1	0.6	1.8	0.7	0.7	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Existing Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	0	111	15	21	336	0	6	0	10	0	0	0
Future Vol, veh/h	0	111	15	21	336	0	6	0	10	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	95	95	95	95	92	95	92	95	92	92	92
Heavy Vehicles, %	2	13	13	2	2	2	6	2	6	2	2	2
Mvmt Flow	0	117	16	22	354	0	6	0	11	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	354	0	-	117	0	0	515	515	117	521	515	354
Stage 1	-	-	-	-	-	-	117	117	-	398	398	-
Stage 2	-	-	-	-	-	-	398	398	-	123	117	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.16	6.52	6.26	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.554	4.018	3.354	3.518	4.018	3.318
Pot Cap-1 Maneuver	1205	-	0	1471	-	-	464	464	924	466	464	690
Stage 1	-	-	0	-	-	-	878	799	-	628	603	-
Stage 2	-	-	0	-	-	-	620	603	-	881	799	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1205	-	-	1471	-	-	459	457	924	455	457	690
Mov Cap-2 Maneuver	-	-	-	-	-	-	459	457	-	455	457	-
Stage 1	-	-	-	-	-	-	878	799	-	628	594	-
Stage 2	-	-	-	-	-	-	611	594	-	871	799	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.4			10.5			0		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	670	1205	-	1471	-	-	-
HCM Lane V/C Ratio	0.025	-	-	0.015	-	-	-
HCM Control Delay (s)	10.5	0	-	7.5	-	-	0
HCM Lane LOS	B	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	0	-	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
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HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Existing Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↙		↕		↘↙	↕
Traffic Vol, veh/h	37	5	283	25	10	537
Future Vol, veh/h	37	5	283	25	10	537
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	6	325	29	11	617

Major/Minor	Minor1	Major1	Major2	Major3	Major4
Conflicting Flow All	979	340	0	0	354
Stage 1	340	-	-	-	-
Stage 2	639	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	277	702	-	-	1205
Stage 1	721	-	-	-	-
Stage 2	526	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	275	702	-	-	1205
Mov Cap-2 Maneuver	396	-	-	-	-
Stage 1	721	-	-	-	-
Stage 2	521	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	418	1205
HCM Lane V/C Ratio	-	-	0.115	0.01
HCM Control Delay (s)	-	-	14.7	8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
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HCM 6th TWSC

Existing Conditions

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

PM Peak Hour

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔			↕	↗	↖	↗	↖		↖	↗
Traffic Vol, veh/h	10	0	23	0	0	0	33	298	0	0	521	41
Future Vol, veh/h	10	0	23	0	0	0	33	298	0	0	521	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	92	87	92	92	92	87	87	92	92	87	87
Heavy Vehicles, %	6	2	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	26	0	0	0	38	343	0	0	599	47

Major/Minor	Minor2		Minor1		Major1		Major2				
Conflicting Flow All	1042	1042	623	1055	1065	343	646	0	343	0	0
Stage 1	623	623	-	419	419	-	-	-	-	-	-
Stage 2	419	419	-	636	646	-	-	-	-	-	-
Critical Hdwy	7.16	6.52	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-
Critical Hdwy Stg 1	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.018	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-
Pot Cap-1 Maneuver	204	230	479	204	223	700	939	-	-	1216	-
Stage 1	467	478	-	612	590	-	-	-	-	-	-
Stage 2	604	590	-	466	467	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-
Mov Cap-1 Maneuver	198	221	479	187	214	700	939	-	-	1216	-
Mov Cap-2 Maneuver	198	221	-	187	214	-	-	-	-	-	-
Stage 1	448	478	-	588	566	-	-	-	-	-	-
Stage 2	580	566	-	440	467	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.1	0	0.9	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	939	-	-	335	-	-	1216	-	-
HCM Lane V/C Ratio	0.04	-	-	0.113	-	-	-	-	-
HCM Control Delay (s)	9	-	-	17.1	0	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	-	-	0	-	-

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Automobile - based Commercial Project  
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HCM 6th AWSC

Existing Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	14.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	7	16	5	35	18	163	12	129	40	355	232	5
Future Vol, veh/h	7	16	5	35	18	163	12	129	40	355	232	5
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles, %	2	2	2	5	5	5	4	4	4	3	3	3
Mvmt Flow	7	16	5	35	18	165	12	130	40	359	234	5
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	10.6	11.3	11.1	17
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	25%	66%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	57%	34%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	18%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	12	129	40	28	53	163	355	232	5
LT Vol	12	0	0	7	35	0	355	0	0
Through Vol	0	129	0	16	18	0	0	232	0
RT Vol	0	0	40	5	0	163	0	0	5
Lane Flow Rate	12	130	40	28	54	165	359	234	5
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.025	0.247	0.069	0.058	0.108	0.284	0.642	0.387	0.007
Departure Headway (Hd)	7.325	6.818	6.108	7.343	7.229	6.199	6.444	5.938	5.23
Convergence, Y/N	Yes								
Cap	488	525	584	486	495	578	559	605	683
Service Time	5.088	4.58	3.87	5.12	4.99	3.96	4.188	3.683	2.975
HCM Lane V/C Ratio	0.025	0.248	0.068	0.058	0.109	0.285	0.642	0.387	0.007
HCM Control Delay	10.3	11.8	9.3	10.6	10.9	11.4	20.1	12.4	8
HCM Lane LOS	B	B	A	B	B	B	C	B	A
HCM 95th-tile Q	0.1	1	0.2	0.2	0.4	1.2	4.5	1.8	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
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HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Existing Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	0	397	42	50	205	0	11	0	78	0	0	0
Future Vol, veh/h	0	397	42	50	205	0	11	0	78	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	86	86	86	86	92	86	92	86	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	462	49	58	238	0	13	0	91	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	238	0	-	462	0	0	816	816	462	862	816	238
Stage 1	-	-	-	-	-	-	462	462	-	354	354	-
Stage 2	-	-	-	-	-	-	354	354	-	508	462	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1329	-	0	1099	-	-	296	311	600	275	311	801
Stage 1	-	-	0	-	-	-	580	565	-	663	630	-
Stage 2	-	-	0	-	-	-	663	630	-	547	565	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1329	-	-	1099	-	-	284	295	600	224	295	801
Mov Cap-2 Maneuver	-	-	-	-	-	-	284	295	-	224	295	-
Stage 1	-	-	-	-	-	-	580	565	-	663	597	-
Stage 2	-	-	-	-	-	-	628	597	-	464	565	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			1.7			13.5			0		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	527	1329	-	1099	-	-	-
HCM Lane V/C Ratio	0.196	-	-	0.053	-	-	-
HCM Control Delay (s)	13.5	0	-	8.5	-	-	0
HCM Lane LOS	B	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.7	0	-	0.2	-	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Existing Plus Project Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖		↗		↖	↗
Traffic Vol, veh/h	11	7	419	16	3	193
Future Vol, veh/h	11	7	419	16	3	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	18	18	3	3	12	12
Mvmt Flow	12	8	455	17	3	210

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	680	464	0
Stage 1	464	-	-
Stage 2	216	-	-
Critical Hdwy	6.58	6.38	-
Critical Hdwy Stg 1	5.58	-	-
Critical Hdwy Stg 2	5.58	-	-
Follow-up Hdwy	3.662	3.462	-
Pot Cap-1 Maneuver	393	566	-
Stage 1	601	-	-
Stage 2	783	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	392	566	-
Mov Cap-2 Maneuver	482	-	-
Stage 1	601	-	-
Stage 2	781	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	512	1040
HCM Lane V/C Ratio	-	-	0.038	0.003
HCM Control Delay (s)	-	-	12.3	8.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

Existing Plus Project Conditions

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

AM Peak Hour

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	25	1	12	26	1	67	17	340	53	44	159	3
Future Vol, veh/h	25	1	12	26	1	67	17	340	53	44	159	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	2	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	1	13	28	1	73	18	370	58	48	173	3

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	743	735	175	713	707	399	176	0	0	428	0	0
Stage 1	271	271	-	435	435	-	-	-	-	-	-	-
Stage 2	472	464	-	278	272	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.52	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.018	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	326	347	858	347	360	651	1400	-	-	1131	-	-
Stage 1	726	685	-	600	580	-	-	-	-	-	-	-
Stage 2	565	564	-	728	685	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	277	328	858	327	341	651	1400	-	-	1131	-	-
Mov Cap-2 Maneuver	277	328	-	327	341	-	-	-	-	-	-	-
Stage 1	717	656	-	592	572	-	-	-	-	-	-	-
Stage 2	494	557	-	685	656	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.5		12.9		0.3		1.8	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1400	-	-	354	327	651	1131	-	-
HCM Lane V/C Ratio	0.013	-	-	0.117	0.09	0.112	0.042	-	-
HCM Control Delay (s)	7.6	-	-	16.5	17.1	11.2	8.3	-	-
HCM Lane LOS	A	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0.4	0.1	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

Existing Plus Project Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	8	8	5	69	31	255	16	154	31	98	106	7
Future Vol, veh/h	8	8	5	69	31	255	16	154	31	98	106	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	5	5	5	3	3	3	8	8	8	11	11	11
Mvmt Flow	8	8	5	72	32	266	17	160	32	102	110	7
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	9.8	11.1	11.1	11
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	38%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	38%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	24%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	16	154	31	21	100	255	98	106	7
LT Vol	16	0	0	8	69	0	98	0	0
Through Vol	0	154	0	8	31	0	0	106	0
RT Vol	0	0	31	5	0	255	0	0	7
Lane Flow Rate	17	160	32	22	104	266	102	110	7
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.032	0.286	0.051	0.041	0.183	0.39	0.197	0.197	0.012
Departure Headway (Hd)	6.924	6.417	5.706	6.804	6.33	5.286	6.936	6.428	5.718
Convergence, Y/N	Yes								
Cap	517	560	627	525	567	680	518	559	626
Service Time	4.663	4.156	3.445	4.555	4.065	3.021	4.673	4.166	3.455
HCM Lane V/C Ratio	0.033	0.286	0.051	0.042	0.183	0.391	0.197	0.197	0.011
HCM Control Delay	9.9	11.7	8.8	9.8	10.5	11.4	11.4	10.7	8.5
HCM Lane LOS	A	B	A	A	B	B	B	B	A
HCM 95th-tile Q	0.1	1.2	0.2	0.1	0.7	1.9	0.7	0.7	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Existing Plus Project Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	20	100	15	21	302	51	6	1	10	28	1	41
Future Vol, veh/h	20	100	15	21	302	51	6	1	10	28	1	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	105	16	22	318	54	6	1	11	29	1	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	372	0	-	105	0	0	558	563	105	542	536	345
Stage 1	-	-	-	-	-	-	147	147	-	389	389	-
Stage 2	-	-	-	-	-	-	411	416	-	153	147	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1186	-	0	1486	-	-	440	435	949	451	451	698
Stage 1	-	-	0	-	-	-	856	775	-	635	608	-
Stage 2	-	-	0	-	-	-	618	592	-	849	775	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1186	-	-	1486	-	-	401	420	949	434	436	698
Mov Cap-2 Maneuver	-	-	-	-	-	-	401	420	-	434	436	-
Stage 1	-	-	-	-	-	-	840	760	-	623	599	-
Stage 2	-	-	-	-	-	-	570	583	-	822	760	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.3			0.4			11.1			12.4		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	610	1186	-	1486	-	-	558
HCM Lane V/C Ratio	0.029	0.018	-	0.015	-	-	0.132
HCM Control Delay (s)	11.1	8.1	0	7.5	-	-	12.4
HCM Lane LOS	B	A	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	0	-	-	0.5

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Existing Plus Project Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↑
Traffic Vol, veh/h	38	5	304	25	10	558
Future Vol, veh/h	38	5	304	25	10	558
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	6	349	29	11	641

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1027	364	0
Stage 1	364	-	-
Stage 2	663	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	260	681	-
Stage 1	703	-	-
Stage 2	512	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	258	681	-
Mov Cap-2 Maneuver	381	-	-
Stage 1	703	-	-
Stage 2	507	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	402	1180
HCM Lane V/C Ratio	-	-	0.123	0.01
HCM Control Delay (s)	-	-	15.2	8.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

Existing Plus Project Conditions

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

PM Peak Hour

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	10	1	23	43	1	41	33	277	28	58	483	41
Future Vol, veh/h	10	1	23	43	1	41	33	277	28	58	483	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	6	2	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	1	26	49	1	47	38	318	32	67	555	47

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1147	1139	579	1136	1146	334	602	0	0	350	0	0
Stage 1	713	713	-	410	410	-	-	-	-	-	-	-
Stage 2	434	426	-	726	736	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.52	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.018	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	173	201	507	179	199	708	975	-	-	1209	-	-
Stage 1	417	435	-	619	595	-	-	-	-	-	-	-
Stage 2	593	586	-	416	425	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	149	183	507	157	181	708	975	-	-	1209	-	-
Mov Cap-2 Maneuver	149	183	-	157	181	-	-	-	-	-	-	-
Stage 1	401	411	-	595	572	-	-	-	-	-	-	-
Stage 2	531	563	-	371	402	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB	
HCM Control Delay, s	19.5		24.9		0.9			0.8	
HCM LOS	C		C						

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	975	-	-	288	157	708	1209	-	-
HCM Lane V/C Ratio	0.039	-	-	0.136	0.322	0.067	0.055	-	-
HCM Control Delay (s)	8.8	-	-	19.5	38.5	10.4	8.2	-	-
HCM Lane LOS	A	-	-	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	1.3	0.2	0.2	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

Existing Plus Project Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	7	17	5	43	19	163	12	134	48	355	237	5
Future Vol, veh/h	7	17	5	43	19	163	12	134	48	355	237	5
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles, %	2	2	2	5	5	5	4	4	4	3	3	3
Mvmt Flow	7	17	5	43	19	165	12	135	48	359	239	5
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	10.7	11.4	11.3	17.4
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	24%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	59%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	17%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	12	134	48	29	62	163	355	237	5
LT Vol	12	0	0	7	43	0	355	0	0
Through Vol	0	134	0	17	19	0	0	237	0
RT Vol	0	0	48	5	0	163	0	0	5
Lane Flow Rate	12	135	48	29	63	165	359	239	5
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.025	0.259	0.083	0.061	0.127	0.286	0.649	0.4	0.007
Departure Headway (Hd)	7.389	6.881	6.171	7.436	7.311	6.263	6.52	6.014	5.306
Convergence, Y/N	Yes								
Cap	483	520	578	480	489	571	552	598	672
Service Time	5.155	4.647	3.936	5.215	5.076	4.028	4.268	3.762	3.054
HCM Lane V/C Ratio	0.025	0.26	0.083	0.06	0.129	0.289	0.65	0.4	0.007
HCM Control Delay	10.3	12.1	9.5	10.7	11.1	11.5	20.6	12.7	8.1
HCM Lane LOS	B	B	A	B	B	B	C	B	A
HCM 95th-tile Q	0.1	1	0.3	0.2	0.4	1.2	4.6	1.9	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Existing Plus Project Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	32	372	42	50	191	30	11	1	78	39	1	23
Future Vol, veh/h	32	372	42	50	191	30	11	1	78	39	1	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	433	49	58	222	35	13	1	91	45	1	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	257	0	-	433	0	0	877	880	433	909	863	240
Stage 1	-	-	-	-	-	-	507	507	-	356	356	-
Stage 2	-	-	-	-	-	-	370	373	-	553	507	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1308	-	0	1127	-	-	269	286	623	256	292	799
Stage 1	-	-	0	-	-	-	548	539	-	661	629	-
Stage 2	-	-	0	-	-	-	650	618	-	517	539	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1308	-	-	1127	-	-	242	261	623	204	267	799
Mov Cap-2 Maneuver	-	-	-	-	-	-	242	261	-	204	267	-
Stage 1	-	-	-	-	-	-	528	519	-	637	597	-
Stage 2	-	-	-	-	-	-	595	586	-	424	519	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			1.5			13.7			22.2		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	516	1308	-	1127	-	-	282
HCM Lane V/C Ratio	0.203	0.028	-	0.052	-	-	0.26
HCM Control Delay (s)	13.7	7.8	0	8.4	-	-	22.2
HCM Lane LOS	B	A	A	A	-	-	C
HCM 95th %tile Q(veh)	0.8	0.1	-	0.2	-	-	1

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Automobile - based Commercial Project  
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HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Near Term Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↘		↙	↘
Traffic Vol, veh/h	11	8	426	18	4	184
Future Vol, veh/h	11	8	426	18	4	184
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	18	18	3	3	12	12
Mvmt Flow	12	9	463	20	4	200

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	681	473	0
Stage 1	473	-	-
Stage 2	208	-	-
Critical Hdwy	6.58	6.38	-
Critical Hdwy Stg 1	5.58	-	-
Critical Hdwy Stg 2	5.58	-	-
Follow-up Hdwy	3.662	3.462	-
Pot Cap-1 Maneuver	392	560	-
Stage 1	595	-	-
Stage 2	790	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	390	560	-
Mov Cap-2 Maneuver	479	-	-
Stage 1	595	-	-
Stage 2	787	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	510	1030
HCM Lane V/C Ratio	-	-	0.04	0.004
HCM Control Delay (s)	-	-	12.4	8.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

Near Term Conditions

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

AM Peak Hour

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	27	0	13	0	0	0	19	416	0	0	192	4
Future Vol, veh/h	27	0	13	0	0	0	19	416	0	0	192	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	4	4	2	2	13	13
Mvmt Flow	29	0	14	0	0	0	21	452	0	0	209	4

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	705	705	211	712	707	452	213	0	0	452	0	0
Stage 1	211	211	-	494	494	-	-	-	-	-	-	-
Stage 2	494	494	-	218	213	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	351	361	829	347	360	608	1345	-	-	1109	-	-
Stage 1	791	728	-	557	546	-	-	-	-	-	-	-
Stage 2	557	546	-	784	726	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	347	355	829	337	354	608	1345	-	-	1109	-	-
Mov Cap-2 Maneuver	347	355	-	337	354	-	-	-	-	-	-	-
Stage 1	778	728	-	548	537	-	-	-	-	-	-	-
Stage 2	548	537	-	771	726	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	0	0.3	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1345	-	-	428	-	-	1109	-	-
HCM Lane V/C Ratio	0.015	-	-	0.102	-	-	-	-	-
HCM Control Delay (s)	7.7	-	-	14.4	0	0	0	-	-
HCM Lane LOS	A	-	-	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	-	-	0	-	-

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Automobile - based Commercial Project  
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HCM 6th AWSC

Near Term Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	9	8	6	66	33	274	18	159	24	106	108	8
Future Vol, veh/h	9	8	6	66	33	274	18	159	24	106	108	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	5	5	3	3	3	8	8	8	11	11	11
Mvmt Flow	10	9	7	72	36	298	20	173	26	115	117	9
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	10.1	12.1	11.8	11.5
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	39%	67%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	35%	33%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	26%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	18	159	24	23	99	274	106	108	8
LT Vol	18	0	0	9	66	0	106	0	0
Through Vol	0	159	0	8	33	0	0	108	0
RT Vol	0	0	24	6	0	274	0	0	8
Lane Flow Rate	20	173	26	25	108	298	115	117	9
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.039	0.318	0.043	0.049	0.193	0.449	0.228	0.215	0.014
Departure Headway (Hd)	7.128	6.619	5.908	7.015	6.457	5.424	7.113	6.605	5.893
Convergence, Y/N	Yes								
Cap	502	543	605	509	555	661	505	542	606
Service Time	4.879	4.37	3.658	4.781	4.202	3.17	4.865	4.357	3.645
HCM Lane V/C Ratio	0.04	0.319	0.043	0.049	0.195	0.451	0.228	0.216	0.015
HCM Control Delay	10.2	12.4	8.9	10.1	10.8	12.6	12	11.2	8.7
HCM Lane LOS	B	B	A	B	B	B	B	B	A
HCM 95th-tile Q	0.1	1.4	0.1	0.2	0.7	2.3	0.9	0.8	0

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Automobile - based Commercial Project  
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HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Near Term Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↗	↖		↕			↕	
Traffic Vol, veh/h	0	119	17	23	361	0	7	0	11	0	0	0
Future Vol, veh/h	0	119	17	23	361	0	7	0	11	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	13	13	2	2	2	6	2	6	2	2	2
Mvmt Flow	0	129	18	25	392	0	8	0	12	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	392	0	-	129	0	0	571	571	129	577	571	392
Stage 1	-	-	-	-	-	-	129	129	-	442	442	-
Stage 2	-	-	-	-	-	-	442	442	-	135	129	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.16	6.52	6.26	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.554	4.018	3.354	3.518	4.018	3.318
Pot Cap-1 Maneuver	1167	-	0	1457	-	-	426	431	910	428	431	657
Stage 1	-	-	0	-	-	-	865	789	-	594	576	-
Stage 2	-	-	0	-	-	-	587	576	-	868	789	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1167	-	-	1457	-	-	420	424	910	417	424	657
Mov Cap-2 Maneuver	-	-	-	-	-	-	420	424	-	417	424	-
Stage 1	-	-	-	-	-	-	865	789	-	594	566	-
Stage 2	-	-	-	-	-	-	577	566	-	857	789	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.5			10.9			0		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	626	1167	-	1457	-	-	-
HCM Lane V/C Ratio	0.031	-	-	0.017	-	-	-
HCM Control Delay (s)	10.9	0	-	7.5	-	-	0
HCM Lane LOS	B	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	0.1	-	-	-

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Automobile - based Commercial Project  
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HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Near Term Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	40	6	304	27	11	576
Future Vol, veh/h	40	6	304	27	11	576
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	7	330	29	12	626

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	995	345	0
Stage 1	345	-	-
Stage 2	650	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	271	698	-
Stage 1	717	-	-
Stage 2	520	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	268	698	-
Mov Cap-2 Maneuver	390	-	-
Stage 1	717	-	-
Stage 2	515	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	414	1200
HCM Lane V/C Ratio	-	-	0.121	0.01
HCM Control Delay (s)	-	-	14.9	8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
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HCM 6th TWSC

Near Term Conditions

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

PM Peak Hour

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	11	0	25	0	0	0	36	320	0	0	559	44
Future Vol, veh/h	11	0	25	0	0	0	36	320	0	0	559	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	2	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	27	0	0	0	39	348	0	0	608	48

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1058	1058	632	1072	1082	348	656	0	0	348	0	0
Stage 1	632	632	-	426	426	-	-	-	-	-	-	-
Stage 2	426	426	-	646	656	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.52	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.018	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	199	225	473	198	217	695	931	-	-	1211	-	-
Stage 1	462	474	-	606	586	-	-	-	-	-	-	-
Stage 2	599	586	-	460	462	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	193	216	473	181	208	695	931	-	-	1211	-	-
Mov Cap-2 Maneuver	193	216	-	181	208	-	-	-	-	-	-	-
Stage 1	443	474	-	581	561	-	-	-	-	-	-	-
Stage 2	574	561	-	434	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	0	0.9	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	328	-	-	1211	-	-
HCM Lane V/C Ratio	0.042	-	-	0.119	-	-	-	-	-
HCM Control Delay (s)	9	-	-	17.5	0	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	-	-	0	-	-

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Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

Near Term Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	18.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	8	18	6	38	20	175	13	139	43	381	249	6
Future Vol, veh/h	8	18	6	38	20	175	13	139	43	381	249	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	5	5	5	4	4	4	3	3	3
Mvmt Flow	9	20	7	41	22	190	14	151	47	414	271	7
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	11.3	12.6	12.3	23.2
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	25%	66%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	56%	34%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	19%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	13	139	43	32	58	175	381	249	6
LT Vol	13	0	0	8	38	0	381	0	0
Through Vol	0	139	0	18	20	0	0	249	0
RT Vol	0	0	43	6	0	175	0	0	6
Lane Flow Rate	14	151	47	35	63	190	414	271	7
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.03	0.304	0.085	0.077	0.133	0.348	0.776	0.469	0.01
Departure Headway (Hd)	7.753	7.244	6.531	7.949	7.621	6.591	6.744	6.237	5.527
Convergence, Y/N	Yes								
Cap	459	493	544	454	468	542	534	576	644
Service Time	5.547	5.037	4.324	5.649	5.41	4.379	4.511	4.003	3.293
HCM Lane V/C Ratio	0.031	0.306	0.086	0.077	0.135	0.351	0.775	0.47	0.011
HCM Control Delay	10.8	13.2	9.9	11.3	11.6	12.9	29.2	14.4	8.3
HCM Lane LOS	B	B	A	B	B	B	D	B	A
HCM 95th-tile Q	0.1	1.3	0.3	0.2	0.5	1.5	7	2.5	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Near Term Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↗	↖		↕			↕	
Traffic Vol, veh/h	0	426	46	54	220	0	12	0	84	0	0	0
Future Vol, veh/h	0	426	46	54	220	0	12	0	84	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	463	50	59	239	0	13	0	91	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	239	0	-	463	0	0	820	820	463	866	820	239
Stage 1	-	-	-	-	-	-	463	463	-	357	357	-
Stage 2	-	-	-	-	-	-	357	357	-	509	463	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1328	-	0	1098	-	-	294	310	599	274	310	800
Stage 1	-	-	0	-	-	-	579	564	-	661	628	-
Stage 2	-	-	0	-	-	-	661	628	-	547	564	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1328	-	-	1098	-	-	282	293	599	223	293	800
Mov Cap-2 Maneuver	-	-	-	-	-	-	282	293	-	223	293	-
Stage 1	-	-	-	-	-	-	579	564	-	661	594	-
Stage 2	-	-	-	-	-	-	625	594	-	464	564	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.7	13.6	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	525	1328	-	1098	-	-	-
HCM Lane V/C Ratio	0.199	-	-	0.053	-	-	-
HCM Control Delay (s)	13.6	0	-	8.5	-	-	0
HCM Lane LOS	B	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.7	0	-	0.2	-	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Near Term Plus Project Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	12	8	450	18	4	207
Future Vol, veh/h	12	8	450	18	4	207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	18	18	3	3	12	12
Mvmt Flow	13	9	489	20	4	225

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	732	499	0
Stage 1	499	-	-
Stage 2	233	-	-
Critical Hdwy	6.58	6.38	-
Critical Hdwy Stg 1	5.58	-	-
Critical Hdwy Stg 2	5.58	-	-
Follow-up Hdwy	3.662	3.462	-
Pot Cap-1 Maneuver	366	541	-
Stage 1	578	-	-
Stage 2	769	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	365	541	-
Mov Cap-2 Maneuver	460	-	-
Stage 1	578	-	-
Stage 2	766	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	489	1007
HCM Lane V/C Ratio	-	-	0.044	0.004
HCM Control Delay (s)	-	-	12.7	8.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

Near Term Plus Project Conditions

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

AM Peak Hour

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	27	2	13	28	2	72	19	365	57	48	171	4
Future Vol, veh/h	27	2	13	28	2	72	19	365	57	48	171	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	2	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	2	14	30	2	78	21	397	62	52	186	4

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	802	793	188	770	764	428	190	0	0	459	0	0
Stage 1	292	292	-	470	470	-	-	-	-	-	-	-
Stage 2	510	501	-	300	294	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.52	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.018	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	298	321	844	318	334	627	1384	-	-	1102	-	-
Stage 1	707	671	-	574	560	-	-	-	-	-	-	-
Stage 2	539	543	-	709	670	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	247	301	844	296	314	627	1384	-	-	1102	-	-
Mov Cap-2 Maneuver	247	301	-	296	314	-	-	-	-	-	-	-
Stage 1	696	639	-	565	552	-	-	-	-	-	-	-
Stage 2	463	535	-	662	639	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	18.1		13.7		0.3		1.8	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1384	-	-	320	297	627	1102	-	-
HCM Lane V/C Ratio	0.015	-	-	0.143	0.11	0.125	0.047	-	-
HCM Control Delay (s)	7.6	-	-	18.1	18.6	11.6	8.4	-	-
HCM Lane LOS	A	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.4	0.4	0.1	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

Near Term Plus Project Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	12
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	9	9	6	74	34	274	18	166	34	106	114	8
Future Vol, veh/h	9	9	6	74	34	274	18	166	34	106	114	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	5	5	3	3	3	8	8	8	11	11	11
Mvmt Flow	10	10	7	80	37	298	20	180	37	115	124	9
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	10.3	12.3	12	11.7
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	38%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	38%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	25%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	18	166	34	24	108	274	106	114	8
LT Vol	18	0	0	9	74	0	106	0	0
Through Vol	0	166	0	9	34	0	0	114	0
RT Vol	0	0	34	6	0	274	0	0	8
Lane Flow Rate	20	180	37	26	117	298	115	124	9
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.039	0.335	0.061	0.052	0.214	0.456	0.231	0.231	0.014
Departure Headway (Hd)	7.196	6.687	5.975	7.13	6.553	5.511	7.206	6.697	5.985
Convergence, Y/N	Yes								
Cap	496	536	597	500	547	652	498	535	596
Service Time	4.956	4.447	3.734	4.904	4.302	3.259	4.964	4.455	3.743
HCM Lane V/C Ratio	0.04	0.336	0.062	0.052	0.214	0.457	0.231	0.232	0.015
HCM Control Delay	10.3	12.8	9.1	10.3	11.1	12.8	12.1	11.5	8.8
HCM Lane LOS	B	B	A	B	B	B	B	B	A
HCM 95th-tile Q	0.1	1.5	0.2	0.2	0.8	2.4	0.9	0.9	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Near Term Plus Project Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	22	108	17	23	324	55	7	2	11	31	2	44
Future Vol, veh/h	22	108	17	23	324	55	7	2	11	31	2	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	117	18	25	352	60	8	2	12	34	2	48

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	412	0	-	117	0	0	622	627	117	604	597	382
Stage 1	-	-	-	-	-	-	165	165	-	432	432	-
Stage 2	-	-	-	-	-	-	457	462	-	172	165	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1147	-	0	1471	-	-	399	400	935	410	416	665
Stage 1	-	-	0	-	-	-	837	762	-	602	582	-
Stage 2	-	-	0	-	-	-	583	565	-	830	762	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1147	-	-	1471	-	-	358	384	935	391	400	665
Mov Cap-2 Maneuver	-	-	-	-	-	-	358	384	-	391	400	-
Stage 1	-	-	-	-	-	-	819	745	-	589	572	-
Stage 2	-	-	-	-	-	-	530	555	-	799	745	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.4			0.4			11.8			13.4		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	548	1147	-	1471	-	-	512
HCM Lane V/C Ratio	0.04	0.021	-	0.017	-	-	0.163
HCM Control Delay (s)	11.8	8.2	0	7.5	-	-	13.4
HCM Lane LOS	B	A	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	0.1	-	-	0.6

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Near Term Plus Project Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗		↖ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	41	6	326	27	11	599
Future Vol, veh/h	41	6	326	27	11	599
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	7	354	29	12	651

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1044	369	0
Stage 1	369	-	-
Stage 2	675	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	254	677	-
Stage 1	699	-	-
Stage 2	506	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	251	677	-
Mov Cap-2 Maneuver	376	-	-
Stage 1	699	-	-
Stage 2	501	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	399	1175
HCM Lane V/C Ratio	-	-	0.128	0.01
HCM Control Delay (s)	-	-	15.3	8.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

Near Term Plus Project Conditions

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

PM Peak Hour

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	11	2	25	47	2	44	36	297	31	63	518	44
Future Vol, veh/h	11	2	25	47	2	44	36	297	31	63	518	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	2	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	2	27	51	2	48	39	323	34	68	563	48

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1166	1158	587	1156	1165	340	611	0	0	357	0	0
Stage 1	723	723	-	418	418	-	-	-	-	-	-	-
Stage 2	443	435	-	738	747	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.52	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.018	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	168	196	502	174	194	702	968	-	-	1202	-	-
Stage 1	411	431	-	612	591	-	-	-	-	-	-	-
Stage 2	586	580	-	410	420	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	144	177	502	151	176	702	968	-	-	1202	-	-
Mov Cap-2 Maneuver	144	177	-	151	176	-	-	-	-	-	-	-
Stage 1	395	406	-	588	567	-	-	-	-	-	-	-
Stage 2	522	557	-	364	396	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	20.3		26.5		0.9		0.8	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	968	-	-	276	152	702	1202	-	-
HCM Lane V/C Ratio	0.04	-	-	0.15	0.35	0.068	0.057	-	-
HCM Control Delay (s)	8.9	-	-	20.3	40.9	10.5	8.2	-	-
HCM Lane LOS	A	-	-	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	1.4	0.2	0.2	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

Near Term Plus Project Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	19.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	8	19	6	47	21	175	13	144	52	381	255	6
Future Vol, veh/h	8	19	6	47	21	175	13	144	52	381	255	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	5	5	5	4	4	4	3	3	3
Mvmt Flow	9	21	7	51	23	190	14	157	57	414	277	7
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	11.5	12.9	12.7	24.3
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	24%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	58%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	18%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	13	144	52	33	68	175	381	255	6
LT Vol	13	0	0	8	47	0	381	0	0
Through Vol	0	144	0	19	21	0	0	255	0
RT Vol	0	0	52	6	0	175	0	0	6
Lane Flow Rate	14	157	57	36	74	190	414	277	7
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.031	0.323	0.105	0.081	0.161	0.358	0.787	0.488	0.01
Departure Headway (Hd)	7.94	7.426	6.716	8.08	7.824	6.775	6.842	6.334	5.624
Convergence, Y/N	Yes								
Cap	453	487	536	445	461	535	526	563	629
Service Time	5.653	5.143	4.429	5.799	5.526	4.476	4.64	4.132	3.421
HCM Lane V/C Ratio	0.031	0.322	0.106	0.081	0.161	0.355	0.787	0.492	0.011
HCM Control Delay	10.9	13.7	10.2	11.5	12	13.2	30.7	15.1	8.5
HCM Lane LOS	B	B	B	B	B	B	D	C	A
HCM 95th-tile Q	0.1	1.4	0.3	0.3	0.6	1.6	7.3	2.7	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Near Term Plus Project Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	35	399	46	54	205	33	12	2	84	42	2	25
Future Vol, veh/h	35	399	46	54	205	33	12	2	84	42	2	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	434	50	59	223	36	13	2	91	46	2	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	259	0	-	434	0	0	884	887	434	916	869	241
Stage 1	-	-	-	-	-	-	510	510	-	359	359	-
Stage 2	-	-	-	-	-	-	374	377	-	557	510	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1306	-	0	1126	-	-	266	283	622	253	290	798
Stage 1	-	-	0	-	-	-	546	538	-	659	627	-
Stage 2	-	-	0	-	-	-	647	616	-	515	538	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1306	-	-	1126	-	-	238	258	622	200	264	798
Mov Cap-2 Maneuver	-	-	-	-	-	-	238	258	-	200	264	-
Stage 1	-	-	-	-	-	-	525	518	-	634	594	-
Stage 2	-	-	-	-	-	-	590	584	-	421	518	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.5	14	22.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	507	1306	-	1126	-	-	277
HCM Lane V/C Ratio	0.21	0.029	-	0.052	-	-	0.271
HCM Control Delay (s)	14	7.8	0	8.4	-	-	22.8
HCM Lane LOS	B	A	A	A	-	-	C
HCM 95th %tile Q(veh)	0.8	0.1	-	0.2	-	-	1.1

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Cumulative Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↙		↔		↘↙	↕
Traffic Vol, veh/h	12	9	455	19	4	196
Future Vol, veh/h	12	9	455	19	4	196
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	18	18	3	3	12	12
Mvmt Flow	13	10	495	21	4	213

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	727	506	0	0	516
Stage 1	506	-	-	-	-
Stage 2	221	-	-	-	-
Critical Hdwy	6.58	6.38	-	-	4.22
Critical Hdwy Stg 1	5.58	-	-	-	-
Critical Hdwy Stg 2	5.58	-	-	-	-
Follow-up Hdwy	3.662	3.462	-	-	2.308
Pot Cap-1 Maneuver	368	536	-	-	1001
Stage 1	574	-	-	-	-
Stage 2	779	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	367	536	-	-	1001
Mov Cap-2 Maneuver	460	-	-	-	-
Stage 1	574	-	-	-	-
Stage 2	776	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	490	1001
HCM Lane V/C Ratio	-	-	0.047	0.004
HCM Control Delay (s)	-	-	12.7	8.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Cumulative Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔			↕	↗	↖	↗	↖		↖	↗
Traffic Vol, veh/h	29	0	14	0	0	0	20	444	0	0	205	4
Future Vol, veh/h	29	0	14	0	0	0	20	444	0	0	205	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	4	4	2	2	13	13
Mvmt Flow	32	0	15	0	0	0	22	483	0	0	223	4

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	752	752	225	760	754	483	227	0	0	483	0	0
Stage 1	225	225	-	527	527	-	-	-	-	-	-	-
Stage 2	527	527	-	233	227	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.236	-	-	2.218	-	-
Pot Cap-1 Maneuver	327	339	814	323	338	584	1330	-	-	1080	-	-
Stage 1	778	718	-	535	528	-	-	-	-	-	-	-
Stage 2	535	528	-	770	716	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	323	333	814	313	332	584	1330	-	-	1080	-	-
Mov Cap-2 Maneuver	323	333	-	313	332	-	-	-	-	-	-	-
Stage 1	765	718	-	526	519	-	-	-	-	-	-	-
Stage 2	526	519	-	756	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.1	0	0.3	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1330	-	-	402	-	-	1080	-	-
HCM Lane V/C Ratio	0.016	-	-	0.116	-	-	-	-	-
HCM Control Delay (s)	7.8	-	-	15.1	0	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	-	-	0	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

Cumulative Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	10	9	6	70	35	292	19	170	26	113	115	9
Future Vol, veh/h	10	9	6	70	35	292	19	170	26	113	115	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	5	5	3	3	3	8	8	8	11	11	11
Mvmt Flow	11	10	7	76	38	317	21	185	28	123	125	10
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	10.4	12.9	12.4	11.9
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	40%	67%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	36%	33%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	24%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	19	170	26	25	105	292	113	115	9
LT Vol	19	0	0	10	70	0	113	0	0
Through Vol	0	170	0	9	35	0	0	115	0
RT Vol	0	0	26	6	0	292	0	0	9
Lane Flow Rate	21	185	28	27	114	317	123	125	10
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.042	0.348	0.048	0.055	0.209	0.49	0.248	0.235	0.016
Departure Headway (Hd)	7.287	6.778	6.065	7.23	6.587	5.553	7.27	6.761	6.048
Convergence, Y/N	Yes								
Cap	490	528	588	493	543	647	493	529	589
Service Time	5.05	4.541	3.827	5.012	4.341	3.308	5.034	4.525	3.812
HCM Lane V/C Ratio	0.043	0.35	0.048	0.055	0.21	0.49	0.249	0.236	0.017
HCM Control Delay	10.4	13.1	9.1	10.4	11.1	13.6	12.4	11.6	8.9
HCM Lane LOS	B	B	A	B	B	B	B	B	A
HCM 95th-tile Q	0.1	1.5	0.2	0.2	0.8	2.7	1	0.9	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Cumulative Conditions  
AM Peak Hour

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	0	127	18	25	385	0	7	0	12	0	0	0
Future Vol, veh/h	0	127	18	25	385	0	7	0	12	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	13	13	2	2	2	6	2	6	2	2	2
Mvmt Flow	0	138	20	27	418	0	8	0	13	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	418	0	-	138	0	0	610	610	138	617	610	418
Stage 1	-	-	-	-	-	-	138	138	-	472	472	-
Stage 2	-	-	-	-	-	-	472	472	-	145	138	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.16	6.52	6.26	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.554	4.018	3.354	3.518	4.018	3.318
Pot Cap-1 Maneuver	1141	-	0	1446	-	-	401	409	900	402	409	635
Stage 1	-	-	0	-	-	-	856	782	-	573	559	-
Stage 2	-	-	0	-	-	-	565	559	-	858	782	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1141	-	-	1446	-	-	395	401	900	390	401	635
Mov Cap-2 Maneuver	-	-	-	-	-	-	395	401	-	390	401	-
Stage 1	-	-	-	-	-	-	856	782	-	573	548	-
Stage 2	-	-	-	-	-	-	554	548	-	846	782	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	11.1	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	612	1141	-	1446	-	-	-
HCM Lane V/C Ratio	0.034	-	-	0.019	-	-	-
HCM Control Delay (s)	11.1	0	-	7.5	-	-	0
HCM Lane LOS	B	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	0.1	-	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Cumulative Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T		T	T
Traffic Vol, veh/h	43	6	324	29	12	615
Future Vol, veh/h	43	6	324	29	12	615
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	7	352	32	13	668

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1062	368	0	0	384
Stage 1	368	-	-	-	-
Stage 2	694	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	247	677	-	-	1174
Stage 1	700	-	-	-	-
Stage 2	496	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	244	677	-	-	1174
Mov Cap-2 Maneuver	369	-	-	-	-
Stage 1	700	-	-	-	-
Stage 2	491	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	391	1174
HCM Lane V/C Ratio	-	-	0.136	0.011
HCM Control Delay (s)	-	-	15.7	8.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.5	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Cumulative Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↗	↖		↖	↗
Traffic Vol, veh/h	12	0	27	0	0	0	38	341	0	0	597	47
Future Vol, veh/h	12	0	27	0	0	0	38	341	0	0	597	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	2	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	0	29	0	0	0	41	371	0	0	649	51

Major/Minor	Minor2		Minor1		Major1		Major2				
Conflicting Flow All	1128	1128	675	1142	1153	371	700	0	371	0	0
Stage 1	675	675	-	453	453	-	-	-	-	-	-
Stage 2	453	453	-	689	700	-	-	-	-	-	-
Critical Hdwy	7.16	6.52	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-
Critical Hdwy Stg 1	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.018	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-
Pot Cap-1 Maneuver	178	204	447	177	197	675	897	-	-	1188	-
Stage 1	437	453	-	586	570	-	-	-	-	-	-
Stage 2	579	570	-	436	441	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-
Mov Cap-1 Maneuver	172	195	447	160	188	675	897	-	-	1188	-
Mov Cap-2 Maneuver	172	195	-	160	188	-	-	-	-	-	-
Stage 1	417	453	-	559	544	-	-	-	-	-	-
Stage 2	553	544	-	407	441	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19	0	0.9	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	897	-	-	300	-	-	1188	-	-
HCM Lane V/C Ratio	0.046	-	-	0.141	-	-	-	-	-
HCM Control Delay (s)	9.2	-	-	19	0	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	-	-	0	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

Cumulative Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	22.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	9	19	6	41	21	187	14	148	46	407	266	6
Future Vol, veh/h	9	19	6	41	21	187	14	148	46	407	266	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	5	5	5	4	4	4	3	3	3
Mvmt Flow	10	21	7	45	23	203	15	161	50	442	289	7
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	11.7	13.4	13.1	28.7
HCM LOS	B	B	B	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	26%	66%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	56%	34%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	18%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	14	148	46	34	62	187	407	266	6
LT Vol	14	0	0	9	41	0	407	0	0
Through Vol	0	148	0	19	21	0	0	266	0
RT Vol	0	0	46	6	0	187	0	0	6
Lane Flow Rate	15	161	50	37	67	203	442	289	7
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.034	0.338	0.095	0.085	0.148	0.389	0.847	0.513	0.01
Departure Headway (Hd)	8.073	7.562	6.847	8.239	7.917	6.895	7.001	6.492	5.781
Convergence, Y/N	Yes								
Cap	445	478	525	436	455	524	522	558	623
Service Time	5.793	5.282	4.567	5.961	5.63	4.595	4.701	4.192	3.481
HCM Lane V/C Ratio	0.034	0.337	0.095	0.085	0.147	0.387	0.847	0.518	0.011
HCM Control Delay	11.1	14.1	10.3	11.7	12	13.9	37.4	15.8	8.5
HCM Lane LOS	B	B	B	B	B	B	E	C	A
HCM 95th-tile Q	0.1	1.5	0.3	0.3	0.5	1.8	8.8	2.9	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Cumulative Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	0	455	49	58	235	0	13	0	90	0	0	0
Future Vol, veh/h	0	455	49	58	235	0	13	0	90	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	495	53	63	255	0	14	0	98	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	255	0	-	495	0	0	876	876	495	925	876	255
Stage 1	-	-	-	-	-	-	495	495	-	381	381	-
Stage 2	-	-	-	-	-	-	381	381	-	544	495	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1310	-	0	1069	-	-	269	287	575	250	287	784
Stage 1	-	-	0	-	-	-	556	546	-	641	613	-
Stage 2	-	-	0	-	-	-	641	613	-	523	546	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1310	-	-	1069	-	-	257	270	575	198	270	784
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	270	-	198	270	-
Stage 1	-	-	-	-	-	-	556	546	-	641	577	-
Stage 2	-	-	-	-	-	-	603	577	-	434	546	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.7	14.3	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	497	1310	-	1069	-	-	-
HCM Lane V/C Ratio	0.225	-	-	0.059	-	-	-
HCM Control Delay (s)	14.3	0	-	8.6	-	-	0
HCM Lane LOS	B	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.9	0	-	0.2	-	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Cumulative Plus Project Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↘		↙	↘
Traffic Vol, veh/h	13	9	480	19	4	221
Future Vol, veh/h	13	9	480	19	4	221
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	18	18	3	3	12	12
Mvmt Flow	14	10	522	21	4	240

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	781	533	0
Stage 1	533	-	-
Stage 2	248	-	-
Critical Hdwy	6.58	6.38	-
Critical Hdwy Stg 1	5.58	-	-
Critical Hdwy Stg 2	5.58	-	-
Follow-up Hdwy	3.662	3.462	-
Pot Cap-1 Maneuver	342	517	-
Stage 1	557	-	-
Stage 2	757	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	341	517	-
Mov Cap-2 Maneuver	441	-	-
Stage 1	557	-	-
Stage 2	754	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	469	977
HCM Lane V/C Ratio	-	-	0.051	0.004
HCM Control Delay (s)	-	-	13.1	8.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

Cumulative Plus Project Conditions

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

AM Peak Hour

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	29	2	14	30	2	77	20	389	61	51	182	4
Future Vol, veh/h	29	2	14	30	2	77	20	389	61	51	182	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	2	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	2	15	33	2	84	22	423	66	55	198	4

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	853	843	200	819	812	456	202	0	0	489	0	0
Stage 1	310	310	-	500	500	-	-	-	-	-	-	-
Stage 2	543	533	-	319	312	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.52	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.018	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	275	300	831	294	313	604	1370	-	-	1074	-	-
Stage 1	692	659	-	553	543	-	-	-	-	-	-	-
Stage 2	517	525	-	693	658	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	224	280	831	272	292	604	1370	-	-	1074	-	-
Mov Cap-2 Maneuver	224	280	-	272	292	-	-	-	-	-	-	-
Stage 1	681	625	-	544	534	-	-	-	-	-	-	-
Stage 2	436	517	-	643	624	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.7	14.3	0.3	1.8
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1370	-	-	293	273	604	1074	-	-
HCM Lane V/C Ratio	0.016	-	-	0.167	0.127	0.139	0.052	-	-
HCM Control Delay (s)	7.7	-	-	19.7	20.1	11.9	8.5	-	-
HCM Lane LOS	A	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0.5	0.2	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

Cumulative Plus Project Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	10	10	6	79	36	292	19	177	36	113	122	9
Future Vol, veh/h	10	10	6	79	36	292	19	177	36	113	122	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	5	5	3	3	3	8	8	8	11	11	11
Mvmt Flow	11	11	7	86	39	317	21	192	39	123	133	10
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	10.6	13.2	12.7	12.2
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	38%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	38%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	23%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	19	177	36	26	115	292	113	122	9
LT Vol	19	0	0	10	79	0	113	0	0
Through Vol	0	177	0	10	36	0	0	122	0
RT Vol	0	0	36	6	0	292	0	0	9
Lane Flow Rate	21	192	39	28	125	317	123	133	10
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.042	0.366	0.067	0.058	0.232	0.498	0.251	0.253	0.017
Departure Headway (Hd)	7.363	6.854	6.14	7.356	6.687	5.644	7.368	6.859	6.146
Convergence, Y/N	Yes								
Cap	485	523	580	484	535	635	486	521	579
Service Time	5.134	4.624	3.91	5.145	4.448	3.404	5.139	4.629	3.915
HCM Lane V/C Ratio	0.043	0.367	0.067	0.058	0.234	0.499	0.253	0.255	0.017
HCM Control Delay	10.5	13.6	9.4	10.6	11.5	13.9	12.6	12	9
HCM Lane LOS	B	B	A	B	B	B	B	B	A
HCM 95th-tile Q	0.1	1.7	0.2	0.2	0.9	2.8	1	1	0.1

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

Cumulative Plus Project Conditions

4: Ellinghouse Drive & Highway 193 (Georgetown Road)

AM Peak Hour

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	23	115	18	25	346	59	7	2	12	33	2	47
Future Vol, veh/h	23	115	18	25	346	59	7	2	12	33	2	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	125	20	27	376	64	8	2	13	36	2	51

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	440	0	-	125	0	0	664	669	125	645	637	408
Stage 1	-	-	-	-	-	-	175	175	-	462	462	-
Stage 2	-	-	-	-	-	-	489	494	-	183	175	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1120	-	0	1462	-	-	374	379	926	385	395	643
Stage 1	-	-	0	-	-	-	827	754	-	580	565	-
Stage 2	-	-	0	-	-	-	561	546	-	819	754	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1120	-	-	1462	-	-	332	363	926	366	378	643
Mov Cap-2 Maneuver	-	-	-	-	-	-	332	363	-	366	378	-
Stage 1	-	-	-	-	-	-	807	736	-	566	555	-
Stage 2	-	-	-	-	-	-	505	536	-	786	736	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.4			0.4			12.1			14		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	531	1120	-	1462	-	-	487
HCM Lane V/C Ratio	0.043	0.022	-	0.019	-	-	0.183
HCM Control Delay (s)	12.1	8.3	0	7.5	-	-	14
HCM Lane LOS	B	A	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	0.1	-	-	0.7

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC  
1: Highway 49 (Coloma Road) & Northside Drive

Cumulative Plus Project Conditions  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	44	6	348	29	12	639
Future Vol, veh/h	44	6	348	29	12	639
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	7	378	32	13	695

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1115	394	0
Stage 1	394	-	-
Stage 2	721	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	230	655	-
Stage 1	681	-	-
Stage 2	482	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	227	655	-
Mov Cap-2 Maneuver	354	-	-
Stage 1	681	-	-
Stage 2	477	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	375	1149
HCM Lane V/C Ratio	-	-	0.145	0.011
HCM Control Delay (s)	-	-	16.2	8.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.5	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

Cumulative Plus Project Conditions

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

PM Peak Hour

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	12	2	27	50	2	47	38	317	33	67	553	47
Future Vol, veh/h	12	2	27	50	2	47	38	317	33	67	553	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	2	29	54	2	51	41	345	36	73	601	51

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1245	1236	627	1233	1243	363	652	0	0	381	0	0
Stage 1	773	773	-	445	445	-	-	-	-	-	-	-
Stage 2	472	463	-	788	798	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	148	173	476	154	174	682	935	-	-	1177	-	-
Stage 1	386	403	-	592	575	-	-	-	-	-	-	-
Stage 2	565	557	-	384	398	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	125	155	476	132	156	682	935	-	-	1177	-	-
Mov Cap-2 Maneuver	125	155	-	132	156	-	-	-	-	-	-	-
Stage 1	369	378	-	566	550	-	-	-	-	-	-	-
Stage 2	498	532	-	336	373	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.7		31.7		0.9		0.8	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	935	-	-	248	133	682	1177	-	-
HCM Lane V/C Ratio	0.044	-	-	0.18	0.425	0.075	0.062	-	-
HCM Control Delay (s)	9	-	-	22.7	50.7	10.7	8.3	-	-
HCM Lane LOS	A	-	-	C	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	1.9	0.2	0.2	-	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

Cumulative Plus Project Conditions

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	23.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	9	20	6	50	22	187	14	154	55	407	272	6
Future Vol, veh/h	9	20	6	50	22	187	14	154	55	407	272	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	5	5	5	4	4	4	3	3	3
Mvmt Flow	10	22	7	54	24	203	15	167	60	442	296	7
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	11.9	13.7	13.4	31.4
HCM LOS	B	B	B	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	26%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	57%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	17%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	14	154	55	35	72	187	407	272	6
LT Vol	14	0	0	9	50	0	407	0	0
Through Vol	0	154	0	20	22	0	0	272	0
RT Vol	0	0	55	6	0	187	0	0	6
Lane Flow Rate	15	167	60	38	78	203	442	296	7
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.035	0.356	0.115	0.088	0.174	0.394	0.874	0.542	0.011
Departure Headway (Hd)	8.166	7.655	6.94	8.374	8.027	6.975	7.111	6.602	5.89
Convergence, Y/N	Yes								
Cap	439	470	517	428	448	516	513	550	611
Service Time	5.908	5.396	4.681	6.126	5.766	4.713	4.811	4.302	3.59
HCM Lane V/C Ratio	0.034	0.355	0.116	0.089	0.174	0.393	0.862	0.538	0.011
HCM Control Delay	11.2	14.6	10.6	11.9	12.5	14.2	41.5	16.8	8.7
HCM Lane LOS	B	B	B	B	B	B	E	C	A
HCM 95th-tile Q	0.1	1.6	0.4	0.3	0.6	1.9	9.5	3.2	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
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HCM 6th TWSC  
4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Cumulative Plus Project Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	37	426	49	58	219	35	13	2	90	45	2	27
Future Vol, veh/h	37	426	49	58	219	35	13	2	90	45	2	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	-	-	220	220	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	463	53	63	238	38	14	2	98	49	2	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	276	0	-	463	0	0	942	945	463	976	926	257
Stage 1	-	-	-	-	-	-	543	543	-	383	383	-
Stage 2	-	-	-	-	-	-	399	402	-	593	543	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1287	-	0	1098	-	-	243	262	599	230	269	782
Stage 1	-	-	0	-	-	-	524	520	-	640	612	-
Stage 2	-	-	0	-	-	-	627	600	-	492	520	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1287	-	-	1098	-	-	215	237	599	177	243	782
Mov Cap-2 Maneuver	-	-	-	-	-	-	215	237	-	177	243	-
Stage 1	-	-	-	-	-	-	502	498	-	613	577	-
Stage 2	-	-	-	-	-	-	567	566	-	393	498	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			1.6			14.9			26.2		
HCM LOS							B			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	479	1287	-	1098	-	-	249
HCM Lane V/C Ratio	0.238	0.031	-	0.057	-	-	0.323
HCM Control Delay (s)	14.9	7.9	0	8.5	-	-	26.2
HCM Lane LOS		B	A	A	-	-	D
HCM 95th %tile Q(veh)	0.9	0.1	-	0.2	-	-	1.3

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HCM 6th TWSC

1: Highway 49 (Coloma Road) & Northside Drive

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	7	419	16	3	193
Future Vol, veh/h	11	7	419	16	3	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	18	18	3	3	12	12
Mvmt Flow	12	8	455	17	3	210

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	680	464	0	0	472
Stage 1	464	-	-	-	-
Stage 2	216	-	-	-	-
Critical Hdwy	6.58	6.38	-	-	4.22
Critical Hdwy Stg 1	5.58	-	-	-	-
Critical Hdwy Stg 2	5.58	-	-	-	-
Follow-up Hdwy	3.662	3.462	-	-	2.308
Pot Cap-1 Maneuver	393	566	-	-	1040
Stage 1	601	-	-	-	-
Stage 2	783	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	392	566	-	-	1040
Mov Cap-2 Maneuver	482	-	-	-	-
Stage 1	601	-	-	-	-
Stage 2	781	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	512	1040
HCM Lane V/C Ratio	-	-	0.038	0.003
HCM Control Delay (s)	-	-	12.3	8.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	25	1	12	26	1	67	17	340	53	44	159	3
Future Vol, veh/h	25	1	12	26	1	67	17	340	53	44	159	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	4	4	4	13	13	13
Mvmt Flow	27	1	13	28	1	73	18	370	58	48	173	3

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	743	735	175	713	707	399	176	0	0	428	0	0
Stage 1	271	271	-	435	435	-	-	-	-	-	-	-
Stage 2	472	464	-	278	272	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.14	-	-	4.23	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.236	-	-	2.317	-	-
Pot Cap-1 Maneuver	331	347	868	347	360	651	1388	-	-	1075	-	-
Stage 1	735	685	-	600	580	-	-	-	-	-	-	-
Stage 2	573	564	-	728	685	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	281	327	868	326	339	651	1388	-	-	1075	-	-
Mov Cap-2 Maneuver	281	327	-	434	429	-	-	-	-	-	-	-
Stage 1	725	654	-	592	572	-	-	-	-	-	-	-
Stage 2	501	557	-	684	654	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.3		12		0.3		1.8	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1388	-	-	359	434	651	1075	-	-
HCM Lane V/C Ratio	0.013	-	-	0.115	0.068	0.112	0.044	-	-
HCM Control Delay (s)	7.6	-	-	16.3	13.9	11.2	8.5	-	-
HCM Lane LOS	A	-	-	C	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.2	0.4	0.1	-	-

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Automobile - based Commercial Project  
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HCM 6th AWSC

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	8	8	5	69	31	255	16	154	31	98	106	7
Future Vol, veh/h	8	8	5	69	31	255	16	154	31	98	106	7
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	5	5	5	3	3	3	8	8	8	11	11	11
Mvmt Flow	8	8	5	72	32	266	17	160	32	102	110	7
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	9.8	11.1	11.1	11
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	38%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	38%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	24%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	16	154	31	21	100	255	98	106	7
LT Vol	16	0	0	8	69	0	98	0	0
Through Vol	0	154	0	8	31	0	0	106	0
RT Vol	0	0	31	5	0	255	0	0	7
Lane Flow Rate	17	160	32	22	104	266	102	110	7
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.032	0.286	0.051	0.041	0.183	0.39	0.197	0.197	0.012
Departure Headway (Hd)	6.924	6.417	5.706	6.804	6.33	5.286	6.936	6.428	5.718
Convergence, Y/N	Yes								
Cap	517	560	627	525	567	680	518	559	626
Service Time	4.663	4.156	3.445	4.555	4.065	3.021	4.673	4.166	3.455
HCM Lane V/C Ratio	0.033	0.286	0.051	0.042	0.183	0.391	0.197	0.197	0.011
HCM Control Delay	9.9	11.7	8.8	9.8	10.5	11.4	11.4	10.7	8.5
HCM Lane LOS	A	B	A	A	B	B	B	B	A
HCM 95th-tile Q	0.1	1.2	0.2	0.1	0.7	1.9	0.7	0.7	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	100	15	21	302	51	6	1	10	28	1	41
Future Vol, veh/h	20	100	15	21	302	51	6	1	10	28	1	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	75	-	220	220	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	13	13	13	2	2	2	6	6	6	2	2	2
Mvmt Flow	21	105	16	22	318	54	6	1	11	29	1	43

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	372	0	-	105	0	0	558	563	105	542	536	345
Stage 1	-	-	-	-	-	-	147	147	-	389	389	-
Stage 2	-	-	-	-	-	-	411	416	-	153	147	-
Critical Hdwy	4.23	-	-	4.12	-	-	7.16	6.56	6.26	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.12	5.52	-
Follow-up Hdwy	2.317	-	-	2.218	-	-	3.554	4.054	3.354	3.518	4.018	3.318
Pot Cap-1 Maneuver	1128	-	0	1486	-	-	434	430	939	451	451	698
Stage 1	-	-	0	-	-	-	846	768	-	635	608	-
Stage 2	-	-	0	-	-	-	610	585	-	849	775	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1128	-	-	1486	-	-	396	415	939	434	436	698
Mov Cap-2 Maneuver	-	-	-	-	-	-	396	415	-	434	436	-
Stage 1	-	-	-	-	-	-	830	753	-	623	599	-
Stage 2	-	-	-	-	-	-	563	576	-	823	760	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	1.4		0.4		11.2		11.9
HCM LOS					B		B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	603	1128	-	1486	-	-	434	698
HCM Lane V/C Ratio	0.03	0.019	-	0.015	-	-	0.07	0.062
HCM Control Delay (s)	11.2	8.3	-	7.5	-	-	13.9	10.5
HCM Lane LOS	B	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	0.1	0.1	-	0	-	-	0.2	0.2

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

1: Highway 49 (Coloma Road) & Northside Drive

**Intersection**

Int Delay, s/veh            0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗		↖ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	38	5	304	25	10	558
Future Vol, veh/h	38	5	304	25	10	558
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	6	349	29	11	641

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1027	364	0
Stage 1	364	-	-
Stage 2	663	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	260	681	-
Stage 1	703	-	-
Stage 2	512	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	258	681	-
Mov Cap-2 Maneuver	381	-	-
Stage 1	703	-	-
Stage 2	507	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	402	1180
HCM Lane V/C Ratio	-	-	0.123	0.01
HCM Control Delay (s)	-	-	15.2	8.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0

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HCM 6th TWSC

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	10	1	23	43	1	41	33	277	28	58	483	41
Future Vol, veh/h	10	1	23	43	1	41	33	277	28	58	483	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	6	6	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	1	26	49	1	47	38	318	32	67	555	47

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1147	1139	579	1136	1146	334	602	0	0	350	0	0
Stage 1	713	713	-	410	410	-	-	-	-	-	-	-
Stage 2	434	426	-	726	736	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	173	198	507	179	199	708	975	-	-	1209	-	-
Stage 1	417	429	-	619	595	-	-	-	-	-	-	-
Stage 2	593	579	-	416	425	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	150	180	507	157	181	708	975	-	-	1209	-	-
Mov Cap-2 Maneuver	150	180	-	258	279	-	-	-	-	-	-	-
Stage 1	401	405	-	595	572	-	-	-	-	-	-	-
Stage 2	531	556	-	371	402	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	19.4		16.6		0.9		0.8	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	975	-	-	289	258	708	1209	-	-
HCM Lane V/C Ratio	0.039	-	-	0.135	0.196	0.067	0.055	-	-
HCM Control Delay (s)	8.8	-	-	19.4	22.3	10.4	8.2	-	-
HCM Lane LOS	A	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.7	0.2	0.2	-	-

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HCM 6th AWSC

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	7	17	5	43	19	163	12	134	48	355	237	5
Future Vol, veh/h	7	17	5	43	19	163	12	134	48	355	237	5
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles, %	2	2	2	5	5	5	4	4	4	3	3	3
Mvmt Flow	7	17	5	43	19	165	12	135	48	359	239	5
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	10.7	11.4	11.3	17.4
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	24%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	59%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	17%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	12	134	48	29	62	163	355	237	5
LT Vol	12	0	0	7	43	0	355	0	0
Through Vol	0	134	0	17	19	0	0	237	0
RT Vol	0	0	48	5	0	163	0	0	5
Lane Flow Rate	12	135	48	29	63	165	359	239	5
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.025	0.259	0.083	0.061	0.127	0.286	0.649	0.4	0.007
Departure Headway (Hd)	7.389	6.881	6.171	7.436	7.311	6.263	6.52	6.014	5.306
Convergence, Y/N	Yes								
Cap	483	520	578	480	489	571	552	598	672
Service Time	5.155	4.647	3.936	5.215	5.076	4.028	4.268	3.762	3.054
HCM Lane V/C Ratio	0.025	0.26	0.083	0.06	0.129	0.289	0.65	0.4	0.007
HCM Control Delay	10.3	12.1	9.5	10.7	11.1	11.5	20.6	12.7	8.1
HCM Lane LOS	B	B	A	B	B	B	C	B	A
HCM 95th-tile Q	0.1	1	0.3	0.2	0.4	1.2	4.6	1.9	0

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HCM 6th TWSC

4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	372	42	50	191	30	11	1	78	39	1	23
Future Vol, veh/h	32	372	42	50	191	30	11	1	78	39	1	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	75	-	220	220	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	433	49	58	222	35	13	1	91	45	1	27

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	257	0	-	433	0	0	877	880	433	909	863	240
Stage 1	-	-	-	-	-	-	507	507	-	356	356	-
Stage 2	-	-	-	-	-	-	370	373	-	553	507	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1308	-	0	1127	-	-	269	286	623	256	292	799
Stage 1	-	-	0	-	-	-	548	539	-	661	629	-
Stage 2	-	-	0	-	-	-	650	618	-	517	539	-
Platoon blocked, %		-										
Mov Cap-1 Maneuver	1308	-	-	1127	-	-	244	264	623	205	269	799
Mov Cap-2 Maneuver	-	-	-	-	-	-	244	264	-	205	269	-
Stage 1	-	-	-	-	-	-	533	524	-	642	597	-
Stage 2	-	-	-	-	-	-	595	586	-	428	524	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.6		1.5		13.7		21	
HCM LOS					B		C	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	517	1308	-	1127	-	-	206	799
HCM Lane V/C Ratio	0.202	0.028	-	0.052	-	-	0.226	0.033
HCM Control Delay (s)	13.7	7.8	-	8.4	-	-	27.5	9.7
HCM Lane LOS	B	A	-	A	-	-	D	A
HCM 95th %tile Q(veh)	0.8	0.1	-	0.2	-	-	0.8	0.1

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HCM 6th TWSC

1: Highway 49 (Coloma Road) & Northside Drive

**Intersection**

Int Delay, s/veh            0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗		↖ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	12	8	450	18	4	207
Future Vol, veh/h	12	8	450	18	4	207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	18	18	3	3	12	12
Mvmt Flow	13	9	489	20	4	225

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	732	499	0
Stage 1	499	-	-
Stage 2	233	-	-
Critical Hdwy	6.58	6.38	-
Critical Hdwy Stg 1	5.58	-	-
Critical Hdwy Stg 2	5.58	-	-
Follow-up Hdwy	3.662	3.462	-
Pot Cap-1 Maneuver	366	541	-
Stage 1	578	-	-
Stage 2	769	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	365	541	-
Mov Cap-2 Maneuver	460	-	-
Stage 1	578	-	-
Stage 2	766	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	489	1007
HCM Lane V/C Ratio	-	-	0.044	0.004
HCM Control Delay (s)	-	-	12.7	8.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

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HCM 6th TWSC

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	27	2	13	28	2	72	19	365	57	48	171	4
Future Vol, veh/h	27	2	13	28	2	72	19	365	57	48	171	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	4	4	4	13	13	13
Mvmt Flow	29	2	14	30	2	78	21	397	62	52	186	4

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	802	793	188	770	764	428	190	0	0	459	0	0
Stage 1	292	292	-	470	470	-	-	-	-	-	-	-
Stage 2	510	501	-	300	294	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.14	-	-	4.23	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.236	-	-	2.317	-	-
Pot Cap-1 Maneuver	302	321	854	318	334	627	1372	-	-	1046	-	-
Stage 1	716	671	-	574	560	-	-	-	-	-	-	-
Stage 2	546	543	-	709	670	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	250	300	854	296	313	627	1372	-	-	1046	-	-
Mov Cap-2 Maneuver	250	300	-	408	408	-	-	-	-	-	-	-
Stage 1	705	637	-	565	552	-	-	-	-	-	-	-
Stage 2	469	535	-	660	637	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18	12.5	0.3	1.9
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1372	-	-	323 408 627	1046	-	-
HCM Lane V/C Ratio	0.015	-	-	0.141 0.08 0.125	0.05	-	-
HCM Control Delay (s)	7.7	-	-	18 14.6 11.6	8.6	-	-
HCM Lane LOS	A	-	-	C B B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5 0.3 0.4	0.2	-	-

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HCM 6th AWSC

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	12
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	9	9	6	74	34	274	18	166	34	106	114	8
Future Vol, veh/h	9	9	6	74	34	274	18	166	34	106	114	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	5	5	3	3	3	8	8	8	11	11	11
Mvmt Flow	10	10	7	80	37	298	20	180	37	115	124	9
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	10.3	12.3	12	11.7
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	38%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	38%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	25%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	18	166	34	24	108	274	106	114	8
LT Vol	18	0	0	9	74	0	106	0	0
Through Vol	0	166	0	9	34	0	0	114	0
RT Vol	0	0	34	6	0	274	0	0	8
Lane Flow Rate	20	180	37	26	117	298	115	124	9
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.039	0.335	0.061	0.052	0.214	0.456	0.231	0.231	0.014
Departure Headway (Hd)	7.196	6.687	5.975	7.13	6.553	5.511	7.206	6.697	5.985
Convergence, Y/N	Yes								
Cap	496	536	597	500	547	652	498	535	596
Service Time	4.956	4.447	3.734	4.904	4.302	3.259	4.964	4.455	3.743
HCM Lane V/C Ratio	0.04	0.336	0.062	0.052	0.214	0.457	0.231	0.232	0.015
HCM Control Delay	10.3	12.8	9.1	10.3	11.1	12.8	12.1	11.5	8.8
HCM Lane LOS	B	B	A	B	B	B	B	B	A
HCM 95th-tile Q	0.1	1.5	0.2	0.2	0.8	2.4	0.9	0.9	0

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HCM 6th TWSC

4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	108	17	23	324	55	7	2	11	31	2	44
Future Vol, veh/h	22	108	17	23	324	55	7	2	11	31	2	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	75	-	220	220	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	2	2	2	6	6	6	2	2	2
Mvmt Flow	24	117	18	25	352	60	8	2	12	34	2	48

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	412	0	117	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.23	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.317	-	2.218	-
Pot Cap-1 Maneuver	1090	0	1471	-
Stage 1	-	0	-	-
Stage 2	-	0	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1090	-	1471	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.4	11.9	12.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	541	1090	-	1471	-	-	392	665
HCM Lane V/C Ratio	0.04	0.022	-	0.017	-	-	0.092	0.072
HCM Control Delay (s)	11.9	8.4	-	7.5	-	-	15.1	10.8
HCM Lane LOS	B	A	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	0.1	-	0.1	-	-	0.3	0.2

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HCM 6th TWSC

1: Highway 49 (Coloma Road) & Northside Drive

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	41	6	326	27	11	599
Future Vol, veh/h	41	6	326	27	11	599
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	7	354	29	12	651

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1044	369	0 0 383 0
Stage 1	369	-	- - - -
Stage 2	675	-	- - - -
Critical Hdwy	6.42	6.22	- - 4.12 -
Critical Hdwy Stg 1	5.42	-	- - - -
Critical Hdwy Stg 2	5.42	-	- - - -
Follow-up Hdwy	3.518	3.318	- - 2.218 -
Pot Cap-1 Maneuver	254	677	- - 1175 -
Stage 1	699	-	- - - -
Stage 2	506	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	251	677	- - 1175 -
Mov Cap-2 Maneuver	376	-	- - - -
Stage 1	699	-	- - - -
Stage 2	501	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	399	1175
HCM Lane V/C Ratio	-	-	0.128	0.01
HCM Control Delay (s)	-	-	15.3	8.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0

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HCM 6th TWSC

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	11	2	25	47	2	44	36	297	31	63	518	44
Future Vol, veh/h	11	2	25	47	2	44	36	297	31	63	518	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	2	27	51	2	48	39	323	34	68	563	48

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1166	1158	587	1156	1165	340	611	0	0	357	0	0
Stage 1	723	723	-	418	418	-	-	-	-	-	-	-
Stage 2	443	435	-	738	747	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	168	193	502	174	194	702	968	-	-	1202	-	-
Stage 1	411	425	-	612	591	-	-	-	-	-	-	-
Stage 2	586	574	-	410	420	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	144	175	502	151	176	702	968	-	-	1202	-	-
Mov Cap-2 Maneuver	144	175	-	251	274	-	-	-	-	-	-	-
Stage 1	395	401	-	588	567	-	-	-	-	-	-	-
Stage 2	522	551	-	364	396	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	20.3		17.1		0.9		0.8	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	968	-	-	276	252	702	1202	-
HCM Lane V/C Ratio	0.04	-	-	0.15	0.211	0.068	0.057	-
HCM Control Delay (s)	8.9	-	-	20.3	23.1	10.5	8.2	-
HCM Lane LOS	A	-	-	C	C	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.8	0.2	0.2	-

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HCM 6th AWSC

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	19.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	8	19	6	47	21	175	13	144	52	381	255	6
Future Vol, veh/h	8	19	6	47	21	175	13	144	52	381	255	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	5	5	5	4	4	4	3	3	3
Mvmt Flow	9	21	7	51	23	190	14	157	57	414	277	7
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	11.5	12.9	12.7	24.3
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	24%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	58%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	18%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	13	144	52	33	68	175	381	255	6
LT Vol	13	0	0	8	47	0	381	0	0
Through Vol	0	144	0	19	21	0	0	255	0
RT Vol	0	0	52	6	0	175	0	0	6
Lane Flow Rate	14	157	57	36	74	190	414	277	7
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.031	0.323	0.105	0.081	0.161	0.358	0.787	0.488	0.01
Departure Headway (Hd)	7.94	7.426	6.716	8.08	7.824	6.775	6.842	6.334	5.624
Convergence, Y/N	Yes								
Cap	453	487	536	445	461	535	526	563	629
Service Time	5.653	5.143	4.429	5.799	5.526	4.476	4.64	4.132	3.421
HCM Lane V/C Ratio	0.031	0.322	0.106	0.081	0.161	0.355	0.787	0.492	0.011
HCM Control Delay	10.9	13.7	10.2	11.5	12	13.2	30.7	15.1	8.5
HCM Lane LOS	B	B	B	B	B	B	D	C	A
HCM 95th-tile Q	0.1	1.4	0.3	0.3	0.6	1.6	7.3	2.7	0

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HCM 6th TWSC

4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	399	46	54	205	33	12	2	84	42	2	25
Future Vol, veh/h	35	399	46	54	205	33	12	2	84	42	2	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	75	-	220	220	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	434	50	59	223	36	13	2	91	46	2	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	259	0	-	434	0	0	884	887	434	916	869	241
Stage 1	-	-	-	-	-	-	510	510	-	359	359	-
Stage 2	-	-	-	-	-	-	374	377	-	557	510	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1306	-	0	1126	-	-	266	283	622	253	290	798
Stage 1	-	-	0	-	-	-	546	538	-	659	627	-
Stage 2	-	-	0	-	-	-	647	616	-	515	538	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1306	-	-	1126	-	-	240	261	622	201	267	798
Mov Cap-2 Maneuver	-	-	-	-	-	-	240	261	-	201	267	-
Stage 1	-	-	-	-	-	-	530	522	-	640	594	-
Stage 2	-	-	-	-	-	-	590	584	-	425	522	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.6		1.5		13.9		21.4	
HCM LOS					B		C	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	509	1306	-	1126	-	-	203	798
HCM Lane V/C Ratio	0.209	0.029	-	0.052	-	-	0.236	0.034
HCM Control Delay (s)	13.9	7.8	-	8.4	-	-	28.1	9.7
HCM Lane LOS	B	A	-	A	-	-	D	A
HCM 95th %tile Q(veh)	0.8	0.1	-	0.2	-	-	0.9	0.1

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HCM 6th TWSC

1: Highway 49 (Coloma Road) & Northside Drive

**Intersection**

Int Delay, s/veh            0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗		↖ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	13	9	480	19	4	221
Future Vol, veh/h	13	9	480	19	4	221
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	18	18	3	3	12	12
Mvmt Flow	14	10	522	21	4	240

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	781	533	0
Stage 1	533	-	-
Stage 2	248	-	-
Critical Hdwy	6.58	6.38	-
Critical Hdwy Stg 1	5.58	-	-
Critical Hdwy Stg 2	5.58	-	-
Follow-up Hdwy	3.662	3.462	-
Pot Cap-1 Maneuver	342	517	-
Stage 1	557	-	-
Stage 2	757	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	341	517	-
Mov Cap-2 Maneuver	441	-	-
Stage 1	557	-	-
Stage 2	754	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	469	977
HCM Lane V/C Ratio	-	-	0.051	0.004
HCM Control Delay (s)	-	-	13.1	8.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

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HCM 6th TWSC

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	29	2	14	30	2	77	20	389	61	51	182	4
Future Vol, veh/h	29	2	14	30	2	77	20	389	61	51	182	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	4	4	4	13	13	13
Mvmt Flow	32	2	15	33	2	84	22	423	66	55	198	4

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	853	843	200	819	812	456	202	0	0	489	0	0
Stage 1	310	310	-	500	500	-	-	-	-	-	-	-
Stage 2	543	533	-	319	312	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.14	-	-	4.23	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.236	-	-	2.317	-	-
Pot Cap-1 Maneuver	279	300	841	294	313	604	1358	-	-	1020	-	-
Stage 1	700	659	-	553	543	-	-	-	-	-	-	-
Stage 2	524	525	-	693	658	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	227	279	841	272	291	604	1358	-	-	1020	-	-
Mov Cap-2 Maneuver	227	279	-	388	390	-	-	-	-	-	-	-
Stage 1	689	623	-	544	534	-	-	-	-	-	-	-
Stage 2	442	517	-	642	622	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	19.5		12.9		0.3		1.9	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1358	-	-	297	388	604	1020	-
HCM Lane V/C Ratio	0.016	-	-	0.165	0.09	0.139	0.054	-
HCM Control Delay (s)	7.7	-	-	19.5	15.2	11.9	8.7	-
HCM Lane LOS	A	-	-	C	C	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.3	0.5	0.2	-

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HCM 6th AWSC

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↖	↗	↖	↖	↗	↗
Traffic Vol, veh/h	10	10	6	79	36	292	19	177	36	113	122	9
Future Vol, veh/h	10	10	6	79	36	292	19	177	36	113	122	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	5	5	3	3	3	8	8	8	11	11	11
Mvmt Flow	11	11	7	86	39	317	21	192	39	123	133	10
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	10.6	13.2	12.7	12.2
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	38%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	38%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	23%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	19	177	36	26	115	292	113	122	9
LT Vol	19	0	0	10	79	0	113	0	0
Through Vol	0	177	0	10	36	0	0	122	0
RT Vol	0	0	36	6	0	292	0	0	9
Lane Flow Rate	21	192	39	28	125	317	123	133	10
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.042	0.366	0.067	0.058	0.232	0.498	0.251	0.253	0.017
Departure Headway (Hd)	7.363	6.854	6.14	7.356	6.687	5.644	7.368	6.859	6.146
Convergence, Y/N	Yes								
Cap	485	523	580	484	535	635	486	521	579
Service Time	5.134	4.624	3.91	5.145	4.448	3.404	5.139	4.629	3.915
HCM Lane V/C Ratio	0.043	0.367	0.067	0.058	0.234	0.499	0.253	0.255	0.017
HCM Control Delay	10.5	13.6	9.4	10.6	11.5	13.9	12.6	12	9
HCM Lane LOS	B	B	A	B	B	B	B	B	A
HCM 95th-tile Q	0.1	1.7	0.2	0.2	0.9	2.8	1	1	0.1

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HCM 6th TWSC

4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	115	18	25	346	59	7	2	12	33	2	47
Future Vol, veh/h	23	115	18	25	346	59	7	2	12	33	2	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	75	-	220	220	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	2	2	2	6	6	6	2	2	2
Mvmt Flow	25	125	20	27	376	64	8	2	13	36	2	51

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	440	0	-	125	0	0	664	669	125	645	637	408
Stage 1	-	-	-	-	-	-	175	175	-	462	462	-
Stage 2	-	-	-	-	-	-	489	494	-	183	175	-
Critical Hdwy	4.23	-	-	4.12	-	-	7.16	6.56	6.26	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.12	5.52	-
Follow-up Hdwy	2.317	-	-	2.218	-	-	3.554	4.054	3.354	3.518	4.018	3.318
Pot Cap-1 Maneuver	1064	-	0	1462	-	-	369	374	915	385	395	643
Stage 1	-	-	0	-	-	-	818	747	-	580	565	-
Stage 2	-	-	0	-	-	-	553	540	-	819	754	-
Platoon blocked, %		-										
Mov Cap-1 Maneuver	1064	-	-	1462	-	-	327	359	915	366	379	643
Mov Cap-2 Maneuver	-	-	-	-	-	-	327	359	-	366	379	-
Stage 1	-	-	-	-	-	-	799	730	-	567	555	-
Stage 2	-	-	-	-	-	-	498	530	-	786	737	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.4	12.2	13.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	524	1064	-	1462	-	-	367	643
HCM Lane V/C Ratio	0.044	0.023	-	0.019	-	-	0.104	0.079
HCM Control Delay (s)	12.2	8.5	-	7.5	-	-	15.9	11.1
HCM Lane LOS	B	A	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	0.1	-	0.1	-	-	0.3	0.3

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

1: Highway 49 (Coloma Road) & Northside Drive

**Intersection**

Int Delay, s/veh            0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗		↖ ↗		↖ ↗	↖ ↗
Traffic Vol, veh/h	44	6	348	29	12	639
Future Vol, veh/h	44	6	348	29	12	639
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	75	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	7	378	32	13	695

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1115	394	0
Stage 1	394	-	-
Stage 2	721	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	230	655	-
Stage 1	681	-	-
Stage 2	482	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	227	655	-
Mov Cap-2 Maneuver	354	-	-
Stage 1	681	-	-
Stage 2	477	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	375	1149
HCM Lane V/C Ratio	-	-	0.145	0.011
HCM Control Delay (s)	-	-	16.2	8.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.5	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	12	2	27	50	2	47	38	317	33	67	553	47
Future Vol, veh/h	12	2	27	50	2	47	38	317	33	67	553	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	0	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	6	6	6	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	2	29	54	2	51	41	345	36	73	601	51

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1245	1236	627	1233	1243	363	652	0	0	381	0	0
Stage 1	773	773	-	445	445	-	-	-	-	-	-	-
Stage 2	472	463	-	788	798	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	148	173	476	154	174	682	935	-	-	1177	-	-
Stage 1	386	403	-	592	575	-	-	-	-	-	-	-
Stage 2	565	557	-	384	398	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	125	155	476	132	156	682	935	-	-	1177	-	-
Mov Cap-2 Maneuver	125	155	-	229	253	-	-	-	-	-	-	-
Stage 1	369	378	-	566	550	-	-	-	-	-	-	-
Stage 2	498	532	-	336	373	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.7		18.6		0.9		0.8	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	935	-	-	248	230	682	1177	-
HCM Lane V/C Ratio	0.044	-	-	0.18	0.246	0.075	0.062	-
HCM Control Delay (s)	9	-	-	22.7	25.7	10.7	8.3	-
HCM Lane LOS	A	-	-	C	D	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.9	0.2	0.2	-

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th AWSC

3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Intersection	
Intersection Delay, s/veh	23.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	9	20	6	50	22	187	14	154	55	407	272	6
Future Vol, veh/h	9	20	6	50	22	187	14	154	55	407	272	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	5	5	5	4	4	4	3	3	3
Mvmt Flow	10	22	7	54	24	203	15	167	60	442	296	7
Number of Lanes	0	1	0	0	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	1
HCM Control Delay	11.9	13.7	13.4	31.4
HCM LOS	B	B	B	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	26%	69%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	57%	31%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	17%	0%	100%	0%	0%	100%
Sign Control	Stop								
Traffic Vol by Lane	14	154	55	35	72	187	407	272	6
LT Vol	14	0	0	9	50	0	407	0	0
Through Vol	0	154	0	20	22	0	0	272	0
RT Vol	0	0	55	6	0	187	0	0	6
Lane Flow Rate	15	167	60	38	78	203	442	296	7
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.035	0.356	0.115	0.088	0.174	0.394	0.874	0.542	0.011
Departure Headway (Hd)	8.166	7.655	6.94	8.374	8.027	6.975	7.111	6.602	5.89
Convergence, Y/N	Yes								
Cap	439	470	517	428	448	516	513	550	611
Service Time	5.908	5.396	4.681	6.126	5.766	4.713	4.811	4.302	3.59
HCM Lane V/C Ratio	0.034	0.355	0.116	0.089	0.174	0.393	0.862	0.538	0.011
HCM Control Delay	11.2	14.6	10.6	11.9	12.5	14.2	41.5	16.8	8.7
HCM Lane LOS	B	B	B	B	B	B	E	C	A
HCM 95th-tile Q	0.1	1.6	0.4	0.3	0.6	1.9	9.5	3.2	0

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

HCM 6th TWSC

4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	426	49	58	219	35	13	2	90	45	2	27
Future Vol, veh/h	37	426	49	58	219	35	13	2	90	45	2	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	75	-	220	220	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	463	53	63	238	38	14	2	98	49	2	29

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	276	0	-	463	0	0	942	945	463	976	926	257
Stage 1	-	-	-	-	-	-	543	543	-	383	383	-
Stage 2	-	-	-	-	-	-	399	402	-	593	543	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1287	-	0	1098	-	-	243	262	599	230	269	782
Stage 1	-	-	0	-	-	-	524	520	-	640	612	-
Stage 2	-	-	0	-	-	-	627	600	-	492	520	-
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	1287	-	-	1098	-	-	217	239	599	178	246	782
Mov Cap-2 Maneuver	-	-	-	-	-	-	217	239	-	178	246	-
Stage 1	-	-	-	-	-	-	508	504	-	620	577	-
Stage 2	-	-	-	-	-	-	567	566	-	397	504	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0.6		1.6		14.8		24.3
HCM LOS					B		C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	480	1287	-	1098	-	-	180	782
HCM Lane V/C Ratio	0.238	0.031	-	0.057	-	-	0.284	0.038
HCM Control Delay (s)	14.8	7.9	-	8.5	-	-	32.7	9.8
HCM Lane LOS		B	A	-	A	-	D	A
HCM 95th %tile Q(veh)	0.9	0.1	-	0.2	-	-	1.1	0.1

## Attachment D: Intersection Queuing Results

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
Existing Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	54	24
Average Queue (ft)	12	2
95th Queue (ft)	39	12
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	NB
Directions Served	LTR	L
Maximum Queue (ft)	51	34
Average Queue (ft)	22	2
95th Queue (ft)	47	14
Link Distance (ft)	39	
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	28	56	99	37	96	59	66	65	29
Average Queue (ft)	10	25	39	10	47	16	29	27	3
95th Queue (ft)	30	43	73	32	78	44	52	50	15
Link Distance (ft)	111	560		623			320		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)			0	0	8	1			
Queuing Penalty (veh)			0	0	3	1			

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
Existing Conditions

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Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

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Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	25	58
Average Queue (ft)	2	15
95th Queue (ft)	14	43
Link Distance (ft)		286
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	220	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

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Network wide Queuing Penalty: 4

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
Existing Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	57	30
Average Queue (ft)	23	4
95th Queue (ft)	49	20
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	NB	SB
Directions Served	LTR	L	TR
Maximum Queue (ft)	63	52	6
Average Queue (ft)	21	12	0
95th Queue (ft)	49	36	4
Link Distance (ft)	39	115	
Upstream Blk Time (%)	2		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)	50		
Storage Blk Time (%)	1		
Queuing Penalty (veh)	2		

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	32	60	86	30	83	54	158	85	14
Average Queue (ft)	14	22	29	9	41	24	64	38	2
95th Queue (ft)	32	46	60	30	69	46	118	69	9
Link Distance (ft)	111	560		623			320		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)			0	0		6	1	0	
Queuing Penalty (veh)			0	0		3	2	0	

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
Existing Conditions

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Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

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Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	29	83
Average Queue (ft)	13	36
95th Queue (ft)	34	63
Link Distance (ft)		286
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	220	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

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Network wide Queuing Penalty: 7

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
Existing Plus Project Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	70	18
Average Queue (ft)	16	1
95th Queue (ft)	49	11
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	L	L	TR
Maximum Queue (ft)	62	39	55	24	48	6
Average Queue (ft)	23	13	17	2	12	0
95th Queue (ft)	52	34	36	14	38	4
Link Distance (ft)	39	194	194			115
Upstream Blk Time (%)	2					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)			50	50		
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	33	60	108	40	83	57	80	80	31
Average Queue (ft)	12	28	37	14	44	19	33	27	4
95th Queue (ft)	32	49	72	38	73	45	64	55	16
Link Distance (ft)	111	560			623		320		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)			0	1		7	1		
Queuing Penalty (veh)			0	1		3	1		

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
Existing Plus Project Conditions

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Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

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Movement	EB	WB	NB	SB
Directions Served	LT	L	LTR	LTR
Maximum Queue (ft)	31	25	40	82
Average Queue (ft)	6	3	16	35
95th Queue (ft)	25	15	41	65
Link Distance (ft)	560		286	142
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		220		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

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Network wide Queuing Penalty: 6

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
Existing Plus Project Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	71	4	30
Average Queue (ft)	24	0	3
95th Queue (ft)	57	3	16
Link Distance (ft)	521	115	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			75
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	L	L	TR
Maximum Queue (ft)	56	53	46	41	38	4
Average Queue (ft)	23	20	13	12	12	0
95th Queue (ft)	51	42	31	35	38	3
Link Distance (ft)	39	194	194			115
Upstream Blk Time (%)	3					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)				50	50	
Storage Blk Time (%)				0	0	
Queuing Penalty (veh)				1	0	

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	38	59	79	30	81	61	163	84	14
Average Queue (ft)	15	21	29	9	41	23	67	37	2
95th Queue (ft)	36	43	56	31	66	50	119	64	9
Link Distance (ft)	111	560			623		320		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)		0	0		7	1	0		
Queuing Penalty (veh)		0	0		4	2	0		

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
 Existing Plus Project Conditions

Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Movement	EB	WB	NB	SB
Directions Served	LT	L	LTR	LTR
Maximum Queue (ft)	44	41	94	84
Average Queue (ft)	5	12	42	35
95th Queue (ft)	26	35	73	69
Link Distance (ft)	560		286	142
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 8

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
Near Term Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	52	30
Average Queue (ft)	14	2
95th Queue (ft)	39	13
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	NB
Directions Served	LTR	L
Maximum Queue (ft)	54	24
Average Queue (ft)	23	3
95th Queue (ft)	48	15
Link Distance (ft)	39	
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	37	62	106	46	90	51	64	69	34
Average Queue (ft)	13	26	41	13	47	16	31	30	3
95th Queue (ft)	32	46	80	38	74	42	53	56	16
Link Distance (ft)	111	560		623			320		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150			40	200	200
Storage Blk Time (%)			0	1			8	1	
Queuing Penalty (veh)			0	1			3	1	

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Near Term Conditions

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Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

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Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	33	64
Average Queue (ft)	3	17
95th Queue (ft)	18	50
Link Distance (ft)		286
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	220	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

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Network wide Queuing Penalty: 5

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Queuing and Blocking Report  
Near Term Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	62	30
Average Queue (ft)	24	4
95th Queue (ft)	49	21
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	NB	NB
Directions Served	LTR	L	TR
Maximum Queue (ft)	68	61	19
Average Queue (ft)	24	16	1
95th Queue (ft)	57	42	14
Link Distance (ft)	39	320	
Upstream Blk Time (%)	3		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)	50		
Storage Blk Time (%)	1		
Queuing Penalty (veh)	2		

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	55	53	74	33	89	56	161	74	15
Average Queue (ft)	16	21	33	8	41	22	68	38	3
95th Queue (ft)	38	39	62	29	68	47	119	65	11
Link Distance (ft)	111	560		623			320		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150			40	200	200
Storage Blk Time (%)			0	0			7	1	0
Queuing Penalty (veh)			0	0			4	2	0

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Near Term Conditions

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Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

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Movement	EB	WB	NB
Directions Served	R	L	LTR
Maximum Queue (ft)	11	41	92
Average Queue (ft)	0	16	41
95th Queue (ft)	8	39	70
Link Distance (ft)			286
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	220	220	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

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Network wide Queuing Penalty: 7

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Queuing and Blocking Report  
Near Term Plus Project Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	46	4	30
Average Queue (ft)	16	0	2
95th Queue (ft)	42	3	13
Link Distance (ft)	521	115	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			75
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	L	L	TR
Maximum Queue (ft)	60	44	45	23	38	12
Average Queue (ft)	26	16	17	2	14	0
95th Queue (ft)	52	37	36	12	39	6
Link Distance (ft)	39	194	194			115
Upstream Blk Time (%)	2					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)				50	50	
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	52	65	101	52	88	57	77	79	31
Average Queue (ft)	14	29	45	15	49	21	35	33	5
95th Queue (ft)	38	50	81	41	78	49	62	65	20
Link Distance (ft)	111	560			623			320	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)		0	1		9	1			
Queuing Penalty (veh)		0	1		4	2			

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 Near Term Plus Project Conditions

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Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

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Movement	EB	WB	WB	NB	SB
Directions Served	LT	L	TR	LTR	LTR
Maximum Queue (ft)	43	26	5	45	71
Average Queue (ft)	7	2	0	16	34
95th Queue (ft)	29	13	3	43	60
Link Distance (ft)	560		583	286	142
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	220				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

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Network wide Queuing Penalty: 7

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Near Term Plus Project Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	70	30
Average Queue (ft)	28	4
95th Queue (ft)	57	20
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	L	L	TR
Maximum Queue (ft)	60	65	51	46	40	12
Average Queue (ft)	26	19	14	14	13	0
95th Queue (ft)	55	44	33	37	39	6
Link Distance (ft)	39	194	194			115
Upstream Blk Time (%)	5					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)			50		50	
Storage Blk Time (%)			0		0	
Queuing Penalty (veh)			1		1	

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	46	59	84	54	86	63	173	90	15
Average Queue (ft)	16	23	33	9	42	26	69	40	3
95th Queue (ft)	37	45	65	34	68	49	124	69	12
Link Distance (ft)	111	560			623			320	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)			0	0		7	1		0
Queuing Penalty (veh)			0	0		4	2		0

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Queuing and Blocking Report  
 Near Term Plus Project Conditions

Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Movement	EB	WB	NB	SB
Directions Served	LT	L	LTR	LTR
Maximum Queue (ft)	52	38	88	66
Average Queue (ft)	8	13	43	32
95th Queue (ft)	33	37	75	56
Link Distance (ft)	560		286	142
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 9

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Queuing and Blocking Report  
Cumulative Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	60	30
Average Queue (ft)	17	2
95th Queue (ft)	47	15
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	NB
Directions Served	LTR	L
Maximum Queue (ft)	58	24
Average Queue (ft)	25	2
95th Queue (ft)	50	14
Link Distance (ft)	39	
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)	50	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	47	62	94	41	101	56	80	62	26
Average Queue (ft)	14	28	41	13	50	18	33	29	4
95th Queue (ft)	35	48	73	38	81	46	60	54	16
Link Distance (ft)	111	560		623			320		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150			40	200	200
Storage Blk Time (%)			0	0			9	1	
Queuing Penalty (veh)			0	0			4	1	

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Queuing and Blocking Report  
Cumulative Conditions

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Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

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Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	20	54
Average Queue (ft)	3	16
95th Queue (ft)	15	45
Link Distance (ft)		286
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	220	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

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Network wide Queuing Penalty: 5

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Queuing and Blocking Report  
Cumulative Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	102	30
Average Queue (ft)	32	4
95th Queue (ft)	71	22
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	NB
Directions Served	LTR	L
Maximum Queue (ft)	69	46
Average Queue (ft)	25	16
95th Queue (ft)	55	38
Link Distance (ft)	39	
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)	50	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	1	

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	42	54	81	49	94	60	162	93	15
Average Queue (ft)	15	21	31	13	46	23	73	44	3
95th Queue (ft)	35	42	60	41	75	49	131	78	12
Link Distance (ft)	111	560		623			320		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150			40	200	200
Storage Blk Time (%)			0	0			8	1	0
Queuing Penalty (veh)			0	0			5	2	0

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Cumulative Conditions

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Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

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Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	62	86
Average Queue (ft)	19	42
95th Queue (ft)	45	67
Link Distance (ft)		286
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	220	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

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Network wide Queuing Penalty: 9

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Cumulative Plus Project Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	70	6	30
Average Queue (ft)	20	0	2
95th Queue (ft)	54	4	15
Link Distance (ft)	521	115	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	75		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	60	47	52	19	14	49	12
Average Queue (ft)	25	17	19	2	1	18	0
95th Queue (ft)	52	38	39	14	8	47	6
Link Distance (ft)	39	194	194		320		115
Upstream Blk Time (%)	2						
Queuing Penalty (veh)	0						
Storage Bay Dist (ft)				50			50
Storage Blk Time (%)						0	
Queuing Penalty (veh)						1	

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	54	60	113	38	100	62	83	85	43
Average Queue (ft)	14	30	48	12	47	24	35	34	6
95th Queue (ft)	39	51	88	36	77	50	66	64	25
Link Distance (ft)	111	560			623			320	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150			40	200	200
Storage Blk Time (%)			0	1			10	1	
Queuing Penalty (veh)			0	2			5	2	

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Cumulative Plus Project Conditions

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Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

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Movement	EB	WB	NB	SB
Directions Served	LT	L	LTR	LTR
Maximum Queue (ft)	39	28	45	64
Average Queue (ft)	6	3	15	36
95th Queue (ft)	27	17	43	58
Link Distance (ft)	560		286	142
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		220		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

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Network wide Queuing Penalty: 9

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 Cumulative Plus Project Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	97	6	30
Average Queue (ft)	30	0	5
95th Queue (ft)	71	5	22
Link Distance (ft)	521	115	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			75
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	63	71	54	51	18	48	4
Average Queue (ft)	24	26	15	17	1	17	0
95th Queue (ft)	53	57	34	41	15	45	3
Link Distance (ft)	39	194	194		320		115
Upstream Blk Time (%)	4						
Queuing Penalty (veh)	0						
Storage Bay Dist (ft)				50		50	
Storage Blk Time (%)				1	0	0	
Queuing Penalty (veh)				2	0	1	

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	43	65	68	39	100	62	178	98	15
Average Queue (ft)	18	25	31	11	47	23	74	46	3
95th Queue (ft)	38	45	57	36	77	49	133	81	13
Link Distance (ft)	111	560			623			320	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)		0	0		9	2	0		
Queuing Penalty (veh)		0	0		6	3	0		

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 Cumulative Plus Project Conditions

Intersection: 4: Ellinghouse Drive & Highway 193 (Georgetown Road)

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	L	LTR	LTR
Maximum Queue (ft)	35	11	50	91	78
Average Queue (ft)	6	0	15	45	32
95th Queue (ft)	26	8	39	76	59
Link Distance (ft)	560			286	142
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		220	220		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 12

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Queuing and Blocking Report  
Mitigated Existing Plus Project Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	61	6	18	16
Average Queue (ft)	16	0	1	1
95th Queue (ft)	46	4	9	11
Link Distance (ft)	521	111		260
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			75	
Storage Blk Time (%)				0
Queuing Penalty (veh)				0

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	55	33	42	38	12	56	36
Average Queue (ft)	23	11	16	3	1	13	1
95th Queue (ft)	49	30	34	19	6	39	22
Link Distance (ft)	41	195	195		310		111
Upstream Blk Time (%)	2						0
Queuing Penalty (veh)	0						0
Storage Bay Dist (ft)				50		50	
Storage Blk Time (%)				0		0	0
Queuing Penalty (veh)				0		1	0

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	27	52	69	41	94	56	76	83	45
Average Queue (ft)	12	23	33	12	43	20	32	28	5
95th Queue (ft)	31	41	59	36	71	46	59	56	24
Link Distance (ft)	112	550			618			310	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)			0		7	1			
Queuing Penalty (veh)			0		3	1			

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Intersection: 4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LTR	LT	R
Maximum Queue (ft)	41	15	63	52	60
Average Queue (ft)	6	1	16	20	22
95th Queue (ft)	27	10	47	45	46
Link Distance (ft)			286	212	212
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75	220			
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Network Summary

Network wide Queuing Penalty: 6

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Queuing and Blocking Report  
 Mitigated Existing Plus Project Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	83	30
Average Queue (ft)	24	2
95th Queue (ft)	59	13
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	L	L
Maximum Queue (ft)	59	46	45	43	41
Average Queue (ft)	25	19	13	10	14
95th Queue (ft)	54	39	31	33	37
Link Distance (ft)	41	195	195		
Upstream Blk Time (%)	3				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)				50	50
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				1	0

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	37	56	82	30	83	64	177	122	67
Average Queue (ft)	15	21	29	10	41	24	68	38	3
95th Queue (ft)	35	43	59	31	68	51	123	82	43
Link Distance (ft)	112	550			618			310	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)		0	0		6	1	0	0	
Queuing Penalty (veh)		0	0		4	2	1	0	

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 Mitigated Existing Plus Project Conditions

Intersection: 4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LTR	LT	R
Maximum Queue (ft)	28	37	98	70	50
Average Queue (ft)	3	13	42	25	16
95th Queue (ft)	16	34	73	58	42
Link Distance (ft)			286	212	212
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75	220			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 8

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Mitigated Near Term Plus Project Conditions

Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	55	30
Average Queue (ft)	16	2
95th Queue (ft)	46	13
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	62	43	54	24	16	60	22
Average Queue (ft)	28	16	17	1	1	19	1
95th Queue (ft)	52	35	39	11	10	48	20
Link Distance (ft)	41	195	195		310		111
Upstream Blk Time (%)	3						0
Queuing Penalty (veh)	0						0
Storage Bay Dist (ft)			50			50	
Storage Blk Time (%)					0	1	0
Queuing Penalty (veh)					0	2	0

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	40	92	107	49	96	61	77	72	42
Average Queue (ft)	14	28	41	14	48	20	33	30	4
95th Queue (ft)	35	59	79	40	82	48	62	57	18
Link Distance (ft)	112	550			618			310	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)			0	1		9	1		
Queuing Penalty (veh)			0	1		5	2		

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study

Queuing and Blocking Report  
 Mitigated Near Term Plus Project Conditions

Intersection: 4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LTR	LT	R
Maximum Queue (ft)	43	18	55	54	58
Average Queue (ft)	6	2	14	18	24
95th Queue (ft)	27	13	42	44	47
Link Distance (ft)			286	212	212
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75	220			
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Network Summary

Network wide Queuing Penalty: 9

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Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	67	11	30
Average Queue (ft)	28	0	3
95th Queue (ft)	56	6	19
Link Distance (ft)	521	111	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			75
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	61	82	50	43	6	51	18
Average Queue (ft)	27	23	13	12	0	14	1
95th Queue (ft)	56	54	33	35	4	41	11
Link Distance (ft)	41	195	195		310		111
Upstream Blk Time (%)	4						
Queuing Penalty (veh)	0						
Storage Bay Dist (ft)				50		50	
Storage Blk Time (%)				0		0	0
Queuing Penalty (veh)				2		2	0

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	45	58	93	51	84	60	152	90	14
Average Queue (ft)	16	22	33	9	44	26	71	42	3
95th Queue (ft)	36	44	66	34	71	48	121	75	11
Link Distance (ft)	112	550			618			310	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)		0	0		7	1	0		
Queuing Penalty (veh)		0	0		5	2	0		

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 Mitigated Near Term Plus Project Conditions

Intersection: 4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	R	L	LTR	LT	R
Maximum Queue (ft)	28	9	33	88	60	42
Average Queue (ft)	5	0	13	41	27	14
95th Queue (ft)	22	6	33	73	50	38
Link Distance (ft)				286	212	212
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75	220	220			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 11
----------------------------------

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Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	70	6	30
Average Queue (ft)	21	0	3
95th Queue (ft)	56	5	17
Link Distance (ft)	521	111	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	75		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	TR	L
Maximum Queue (ft)	60	61	79	31	26	58
Average Queue (ft)	25	16	21	4	2	20
95th Queue (ft)	48	43	51	19	13	50
Link Distance (ft)	41	195	195		310	
Upstream Blk Time (%)	2					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)				50		50
Storage Blk Time (%)				0	0	1
Queuing Penalty (veh)				0	0	2

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	62	72	92	56	102	70	85	74	28
Average Queue (ft)	17	30	44	13	53	22	34	30	3
95th Queue (ft)	44	55	75	41	90	53	63	58	16
Link Distance (ft)	112	550			618			310	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85	150		40	200		200
Storage Blk Time (%)			0	0		12	1		
Queuing Penalty (veh)			0	0		6	2		

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 Mitigated Cumulative Plus Project Conditions

Intersection: 4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Movement	EB	WB	NB	SB	SB
Directions Served	L	L	LTR	LT	R
Maximum Queue (ft)	51	26	55	56	57
Average Queue (ft)	8	2	19	21	27
95th Queue (ft)	30	14	48	49	48
Link Distance (ft)			286	212	212
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75	220			
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Network Summary

Network wide Queuing Penalty: 12

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Intersection: 1: Highway 49 (Coloma Road) & Northside Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	102	30
Average Queue (ft)	32	5
95th Queue (ft)	72	22
Link Distance (ft)	521	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	75	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Highway 49 (Coloma Road) & Retail Driveway/Project Driveway

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	L	L	TR
Maximum Queue (ft)	67	72	53	43	42	2
Average Queue (ft)	28	25	14	15	15	0
95th Queue (ft)	57	57	34	39	39	2
Link Distance (ft)	41	195	195			111
Upstream Blk Time (%)	5					
Queuing Penalty (veh)	0					
Storage Bay Dist (ft)			50	50		
Storage Blk Time (%)			1	0		
Queuing Penalty (veh)			2	1		

Intersection: 3: Highway 49 (Coloma Road) & Shopping Center Driveway/Highway 193 (Georgetown Road)

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	LTR	LT	R	L	T	R	L	T	R	
Maximum Queue (ft)	42	69	72	38	99	62	180	96	15	
Average Queue (ft)	18	23	31	11	46	26	75	43	4	
95th Queue (ft)	38	47	58	34	77	49	131	74	13	
Link Distance (ft)	112	550			618			310		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			85	150		40	200		200	
Storage Blk Time (%)			0	0		9	2		0	
Queuing Penalty (veh)			0	0		6	3		0	

DR22-0007 Cool Station  
 Automobile - based Commercial Project  
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 Mitigated Cumulative Plus Project Conditions

Intersection: 4: Ellinghouse Drive/Project Driveway & Highway 193 (Georgetown Road)

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	R	L	LTR	LT	R
Maximum Queue (ft)	29	11	46	105	63	51
Average Queue (ft)	5	0	16	45	27	18
95th Queue (ft)	22	8	39	79	55	45
Link Distance (ft)				286	212	212
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	75	220	220			
Storage Blk Time (%)						
Queuing Penalty (veh)						

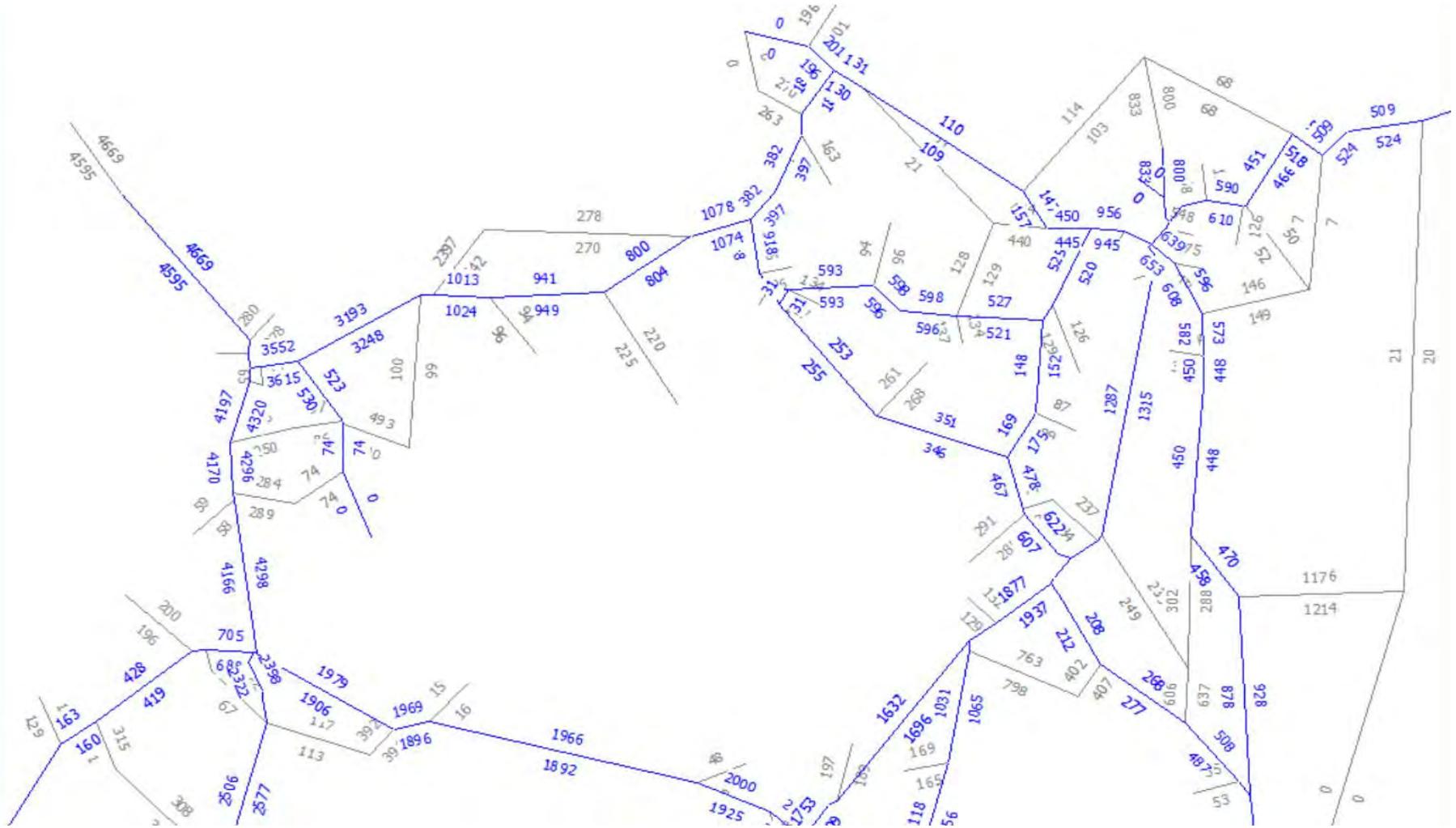
Network Summary

Network wide Queuing Penalty: 12

## Attachment E: El Dorado County Demand Model Plots

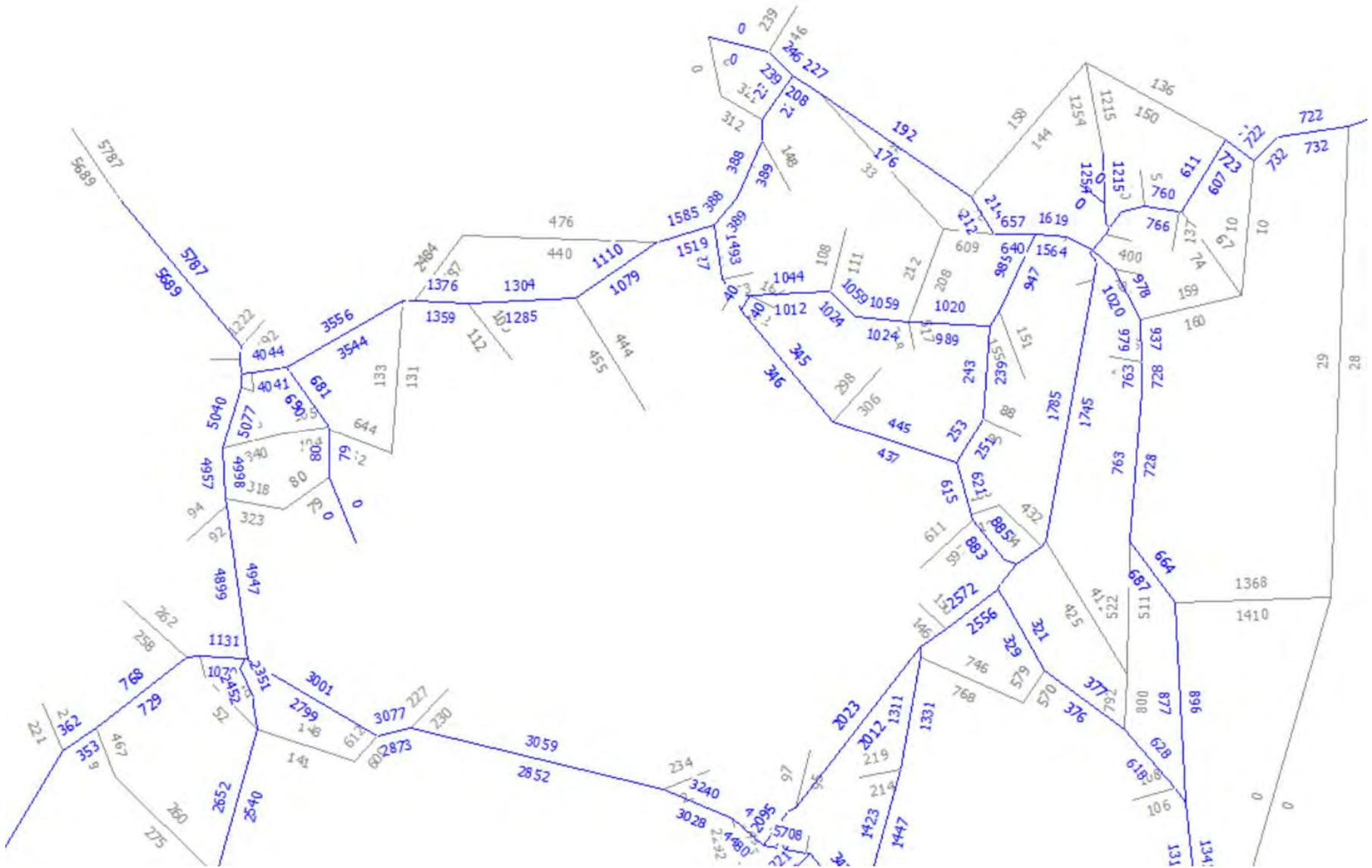
DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit K Traffic Analysis Study

2018 El Dorado County Transportation Demand Model; Daily Volumes



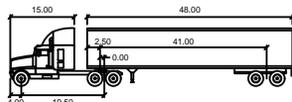
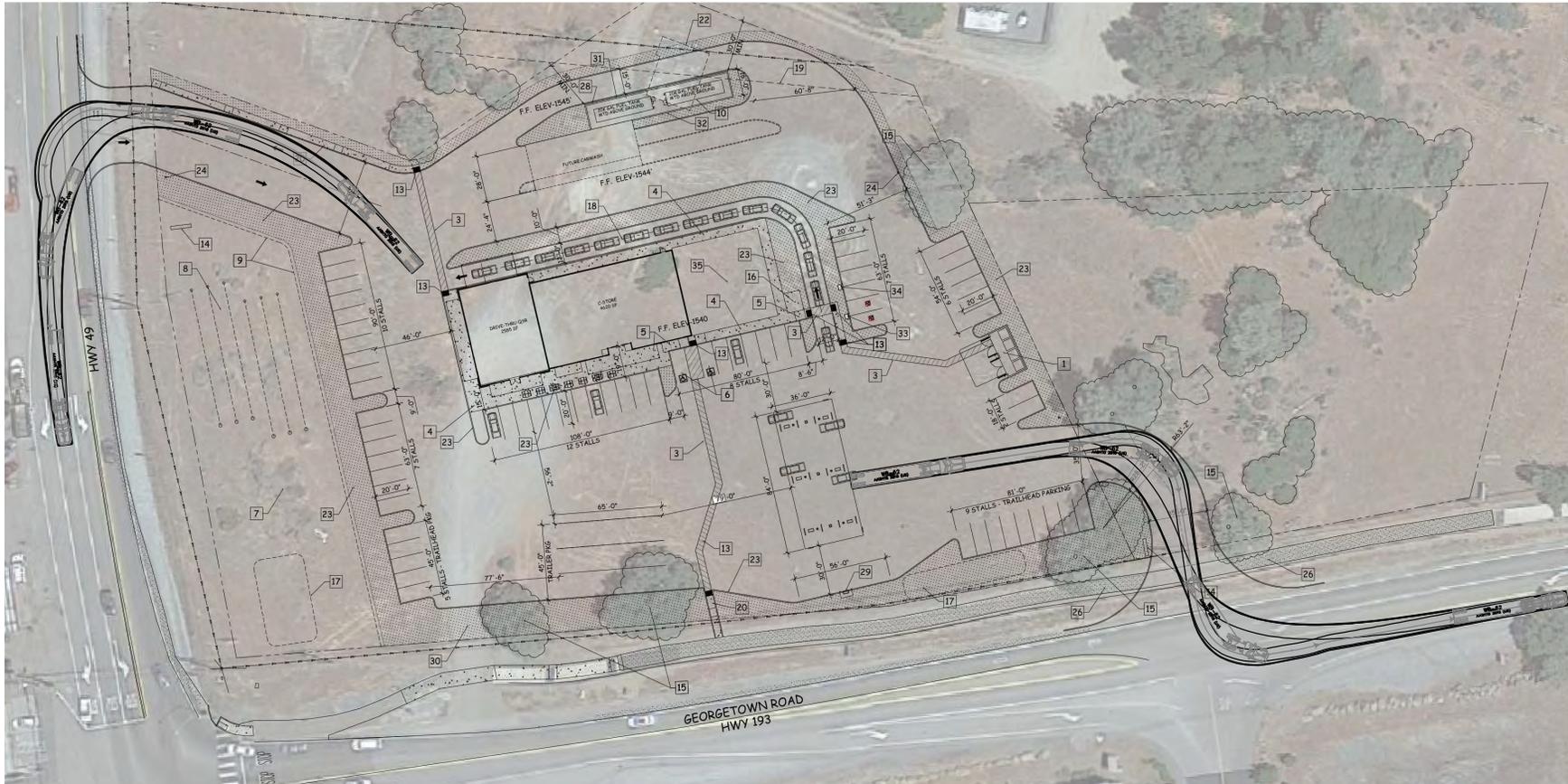
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2040 El Dorado County Transportation Demand Model; Daily Volumes



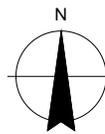
## Attachment F: Truck Turning Templates

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 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study



WB-62

feet			
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		



MHA DESIGN SERVICES  
 COOL AUTOMOBILE AND COMMERCIAL CENTER  
 TRAFFIC IMPACT ANALYSIS MEMORANDUM  
 EXITING LEFT TRUCK TURNING  
 MOVEMENTS

Project No. 12579129  
 Date 7/18/2023

FIGURE 13.4

## Attachment G: Drive-Through Vehicle Queue Surveys

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 Automobile - based Commercial Project  
 Exhibit K Traffic Analysis Study

**TABLE C1: IN-N-OUT RESTAURANT DRIVE-THRU VEHICLE QUEUE SURVEYS**

Location		Mid-day Survey		PM Survey	
		Average Queue	95th % Queue	Average Queue	95th % Queue
<b>In-N-Out San Ramon (2270 San Ramon Valley)</b> 2912 sq. ft.					
Survey 1	Drive-Thru Vehicle Queue:	11	14	12	18
Survey 2	Drive-Thru Vehicle Queue:	15	19	13	18
Survey 3	Drive-Thru Vehicle Queue:	12	15	12	16
Combined San Ramon Surveys	Drive-Thru Vehicle Queue:	13	16	12	17
<b>In-N-Out Livermore (1881 N. Livermore Ave.)</b> 3160 sq. ft.					
Survey 1	Drive-Thru Vehicle Queue:	12	17	12	18
Survey 2	Drive-Thru Vehicle Queue:	12	17	11	17
Survey 3	Drive-Thru Vehicle Queue:	12	16	11	14
Combined Livermore Surveys	Drive-Thru Vehicle Queue:	12	17	11	16
<b>In-N-Out Redwood City (949 Veterans Blvd.)</b> 3407 sq. ft.					
Survey 1	Drive-Thru Vehicle Queue:	12	18	10	14
Survey 2	Drive-Thru Vehicle Queue:	9	12	10	13
Survey 3	Drive-Thru Vehicle Queue:	9	12	9	13
Combined Redwood City Surveys	Drive-Thru Vehicle Queue:	10	14	10	13
<b>All Surveys Combined</b>	<b>Overall Drive Thru Queue:</b>	<b>12</b>	<b>16</b>	<b>11</b>	<b>16</b>

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**TABLE C2: STARBUCKS DRIVE-THRU VEHICLE QUEUE SURVEYS**

Location		AM Survey		PM Survey	
		Average Queue	95th % Queue	Average Queue	95th % Queue
<b>Starbucks Oakley (Hwy. 160/Main)</b> 614 sq. ft.					
Survey 1	Drive-Thru Vehicle Queue:	7	12	1	2
Survey 2	Drive-Thru Vehicle Queue:	6	12	1	4
Survey 3	Drive-Thru Vehicle Queue:	8	13	2	5
Combined Oakley Surveys	Drive-Thru Vehicle Queue:	7	12	1	4
<b>Starbucks Antioch (Lone Tree Way/Deer Valley Rd.)</b> 1400 sq. ft.					
Survey 1	Drive-Thru Vehicle Queue:	6	9	2	4
Survey 2	Drive-Thru Vehicle Queue:	10	12	2	5
Survey 3	Drive-Thru Vehicle Queue:	4	8	1	3
Combined Deer Valley Rd. Surveys	Drive-Thru Vehicle Queue:	7	10	2	4
<b>Starbucks Antioch (Lone Tree Way/Blue Rock)</b> 1844 sq. ft.					
Survey 1	Drive-Thru Vehicle Queue:	6	9	2	3
Survey 2	Drive-Thru Vehicle Queue:	5	11	2	5
Survey 3	Drive-Thru Vehicle Queue:	6	11	2	4
Combined Blue Rock Surveys	Drive-Thru Vehicle Queue:	6	10	2	4
<b>All Surveys Combined</b>	<b>Drive Thru Vehicle Queue:</b>	<b>6</b>	<b>11</b>	<b>2</b>	<b>4</b>

## **Attachment H: Replica Data**





**Attachment I:** Caltrans Appendix J (Figure 205.1)

## Appendix J – Road Connections and Driveways

### Table of Contents

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Design Guidelines for Typical Rural Driveways in State Right of Way. .... 2

## Design Guidelines for Typical Rural Driveways in State Right of Way.

### REFERENCES:

Please always refer to the latest Highway Design Manual (HDM) for most up to date guidelines. The HDM indexes referenced in the guidelines below can be accessed online from the following link:

<https://dot.ca.gov/programs/design/manual-highway-design-manual-hdm>

### Initial Driveway Design Considerations:

1. **Location of the driveway shall be designed to maximize corner sight distance.** For corner sight distance, see HDM Index 405.1 (2) (c). Driveway proposals that do not meet sight distance requirements will not be permitted. The minimum corner sight distance shall be equal to the stopping sight distance as given in HDM Table 201.1. HDM Table 101.2 shows appropriate ranges of design speeds that shall be used for the various types of facilities, place types, and conditions listed. (See HDM Table 101.2 Vehicular Design Speed; Table 201.1 Sight Distance Standards; Index 205.4 Driveways on Frontage roads and in Rural Areas; Index 405.1 (2) Corner Sight Distance)
2. **Driveways connecting to State highways shall be paved a minimum of 20 feet from the edge of shoulder** or to the edge of State right of way, whichever is less to minimize or eliminate gravel from being scattered on the highway and to provide a paved surface for vehicles and bicycles to accelerate and merge. Where larger design vehicles are using the driveway (e.g., dump trucks, flatbed trucks, moving vans, etc.), extend paving so the drive wheels will be on a paved surface when accelerating onto the roadway (See HDM Index 205.4 Driveways on Frontage roads and in Rural Areas).

**Driveway Design Details:** Once considerations 1 and 2 above are met, driveway shall be designed per the following requirements:

3. Where County or City Regulations differ from the State's, it may be desirable to follow their regulations (See HDM Index 205.4 Driveways on Frontage roads and in Rural Areas).

OR

4. Design details are shown on HDM Figure 205.1. This detail, without the recess, may be used on conventional highways (See HDM Figure 205.1 Access Openings on Expressways, Note 2).
5. Approach and departure tapers should be 50 feet longitudinal and 8 feet from edge of traveled way at the end of the taper. Approach and departure tapers are not required where the existing paved shoulder is at least 8 feet wide (See HDM Figure 205.1 Access Openings on Expressways).

**Structural Section Design Details:** Driveways structural section has to meet the following requirements:

6. Approach and departure tapers should have structural sections matching the existing State highway shoulders. An alternate shoulder design is allowed. See HDM Figure 613.4B for details. For asphalt driveway the structural section should be equal to or greater than edge of shoulder or approach and departure tapers. Minimum thickness of surface course is 0.35 foot. Aggregate base depth should match State highway shoulders. Details (cross section, etc.) for concrete driveways are shown on Standard Plan A87A. Minimum thickness at driveway shall be 4 inches for residential and 6 inches for commercial. (See HDM 613. 4 (2) Shoulders; Standard Plan A87A Curb and Driveways; Standard Plans are available at:

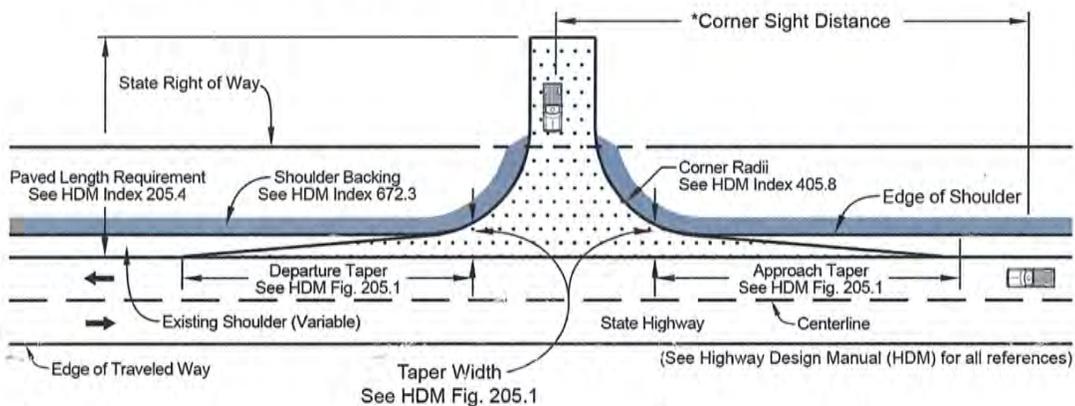
DR22-0007 Cool Station  
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<https://dot.ca.gov/programs/design/ccs-standard-plans-and-standard-specifications>

7. Place shoulder backing from the edge of pavement (EP) to the hinge point (HP). Shoulder backing should be placed on a width of at least 2 feet from EP. For placement of shoulder backing thickness greater than 0.5 foot for slope repair; shoulder backing behind dikes; and where longitudinal drainage are present; see HDM for details. (see HDM Index 672 Shoulder Backing and HDM Figures 672.3 A through E)

The Figure below is provided to assist driveway design for rural areas and to clarify terminologies used in the above guidance. This figure is provided for general illustration purposes and is not used for design details. It should not be used as a drawing in the encroachment permit application for the driveway.

### Driveway Design Requirements for Rural Areas with Unimproved Frontage on Conventional State Highways



\*Corner Sight Distance shall be calculated from all directions of approach.  
See HDM Index 405.1(2) & Figure 405.7 for set back and sight distance calculations.

Purpose: The above excerpts from the Department's HDM are shown for reference. The design standards used for any project should equal or exceed the minimum given in the manual to the maximum extent feasible. They do not replace engineering knowledge, experience, and judgment in the design of driveways.

8. Special situations may call for variation from policies and procedures, subject to the appropriate approval. This is not intended to, nor does it establish a legal standard or any other standard of conduct or duty toward the public.



## COMMUNITY DEVELOPMENT SERVICES PLANNING AND BUILDING DEPARTMENT

<http://www.edcgov.us/DevServices/>

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**PLANNING**

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[planning@edcgov.us](mailto:planning@edcgov.us)

**LAKE TAHOE OFFICE:**

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South Lake Tahoe, CA 96150

(530) 573-3330

(530) 542-9082 Fax

September 2, 2022

Melvin Higginbotham  
11584 Francis Drive  
Grass Valley, CA 95949

**RE: Pre-Application PA21-0021 | Cool Automobile and Commercial Center  
Existing Undeveloped Parcel located at the intersection between State Highway 49 and State  
Highway 193 in the Cool Rural Center | Assessor's Parcel Number (APN) 071-080-007**

To: Melvin Higginbotham,

The following information is provided as a summary regarding your Pre-Application proposal to develop an 8,500-square-foot commercial structure which will house a 4,500-square-foot C-Store convenience gas station, a 2,500-square-foot drive-thru restaurant, and a 1,500-square-foot non-drive thru tenant. The site will include additional facilities including a 1,892-square-foot carwash, 3,024-square-foot automobile fuel canopy covering six-gas-pumps, and a 2,016-square-foot truck and RV fuel canopy covering three-gas-pumps on a 3.83-acre parcel zoned as General Commercial – Community Design Review (CG - DR).

**1. Proposed Project Description/Location/Adjacent Uses/Exhibits:**

- A. Proposed Project Description/Location: To develop an 8,500-square-foot commercial structure which will house a 4,500-square-foot C-Store convenience gas station, a 2,500-square-foot drive-thru restaurant, and a 1,500-square-foot non-drive thru tenant. The site will include additional facilities including a 1,892-square-foot carwash, 3,024-square-foot automobile fuel canopy covering six-gas-pumps, and a 2,016-square-foot truck and RV fuel canopy covering three-gas-pumps on a 3.83-acre general commercial zoned property.

The site will include two access points. These access points will be from an encroachment onto State Highway 49 and an encroachment onto State Highway 193. The location of these two encroachments will provide 360-degree access to structures on site for fire and emergency circulation.

Site developments will include a trash enclosure area, 53-parking stalls, two 20,000-gallon above ground fuel tanks, as well as parking, landscaping, and lighting improvements. The site includes an existing rock formation area, which remain undeveloped in efforts to protect these geological resources on site.

The current pre-application does not include interior plans, exterior photo simulations, or color board information for the proposed developments. These documents will be required for a full design review application submittal.

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Automobile - based Commercial Project  
Exhibit L - Pre-Application PA21-0021

PA21-0021/Cool Automobile and Commercial Center/Pre-Application  
Page 2

The proposed 100-foot-long car wash is located parallel to the eastern property line. The entrance to the car wash is from a dedicated two-lane drive aisle stacking lane located due north of the proposed SR193 encroachment. The stacking lane provides 170-feet of stacking space. The car wash exit point places vehicles at the northeastern corner of the site, presumably more easily existing the overall project site from the proposed SR49 encroachment. In addition to the carwash, there is a 15-foot-wide drive aisle meant for fuel truck deliveries to the above ground fuel tanks along the eastern side of the project site.

The site plan includes a total of 38 parking stalls. Two of these parking stalls will be American's with Disabilities Act (ADA) compliant. Four of these parking stalls will be able to host Truck/RV customers.

Although the project did not include landscaping plans, the project did declare that all existing trees will remain on site, unless they are found to be dead, diseased, or dying. Color boards, landscaping, outdoor lighting, and signage plans have not been provided for purposes of this pre-application review. However, these plans will be required for future planning and/or building permit review. Additionally, it was not declared whether the site operations would be allowed on a 24-hour basis. Although there is not a specific regulation precluding 24-hour operations, the project could be conditioned by the reviewing authority at time of public hearing.

The required setbacks are 10-feet for the front and secondary front yards and five-feet for the side and rear yards. The project as proposed is compliant with these setback standards. The property is zoned as General Commercial (GC) with a General Plan Land Use Designation of Commercial (C). The parcel is located in the Cool Rural Center (Exhibits A, B).

Adjacent Uses: The site is surrounded by CC zoned parcels to the west and by CG zoned properties on all other sides. Approximately 650-feet to the west are RM zoned properties. Approximately 1200-feet to the south is an RE-5 zoned parcel. These are the closest residentially zoned properties to the subject project site.

B. Exhibits:

Exhibit A: Location/Vicinity Map

Exhibit B: Aerial Map

Exhibit C: General Plan Land Use Designation Map

Exhibit D: Zoning Map

Exhibit E: Parcel Data Information

Exhibit F: Pre-Application with Site Plans

Exhibit G: El Dorado County Zoning Ordinance:

- Chapter 130.24 – Commercial Zones, including Section 130.22.010 Community Commercial (CC) Zones, Table 130.22.020 Allowed Uses and Permit Requirements for Commercial Zones, and Section 130.22.030 Commercial Zones Development Standards;
- Chapter 130.33 – Landscaping Standards
- Chapter 130.34 – Outdoor Lighting
- Chapter 130.35 – Parking and Loading
- Chapter 130.36 – Signs
- Chapter 130.37 – Noise Standards

Exhibit H: Community Design Standards - Parking and Loading Standards

DR22-0007 Cool Station  
Automobile - based Commercial Project  
Exhibit L - Pre-Application PA21-0021

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Page 3

Exhibit I: Community Design Standards – Outdoor Lighting Standards  
Exhibit J: Community Design Standards – Landscaping and Irrigation Standards  
Exhibit K: Comments – El Dorado Environmental Management Department  
Exhibit L: Comments – El Dorado County Air Quality Management District  
Exhibit M: Comments - El Dorado County Storm Water Division  
Exhibit N: Comments - California Regional Water Quality Control Board  
Exhibit O: Comments – El Dorado County Surveyor Department  
Exhibit P: Comments – Department of Transportation  
Exhibit Q: Comments – California Department of Transportation  
Exhibit R: Comments – Cool/Pilot Hill Advisory Committee

**2. Zoning Consistency:**

The subject parcel is zoned as General Commercial – Community Design Review (GC-DR) Zone District and is currently undeveloped. The GC zone district allows for Automotive and Equipment Fuel Sales and Repair Shop/Carwash uses. Additionally, drive-thru facilities are allowed by right, unless the parcel is adjacent to a residential zone or residentially developed parcel. This parcel is not adjacent to any residentially zoned or developed properties. The project site is approximately 650-feet from the closest residentially zoned and/or developed property. The design review overlay applied to the site requires a ministerial design review permit. A design review permit proposal may require discretionary review in whole or in part, depending on project consistency with design standards and/or certain specific site constraints which may not have been known at the time of this pre-application review (Exhibit D).

The General Commercial (GC) Zone provides a mix of more intensive commercial uses, such as light manufacturing, automobile repair, and wholesale activity; where outdoor storage or activity commonly occurs; and where residential, civic, and educational uses are limited to avoid conflicts with allowed uses.

Parking and Loading: Table 130.35.030.1 - Parking and Loading Requirements for vehicle fuel sales and car wash uses. Vehicle fuel sales uses require one parking stall per every 400-square-feet of office/retail active use area. The Gas Station C-Store is proposed to include 4,500-square-feet of undefined interior space. Assuming all area is active use area, then the total number of parking spaces for this unit is equal to 11-parking stalls rounded to the nearest whole number. Car wash uses require two parking stalls per washing stall, of which drive-through stalls may utilize stacking areas with a length of 24-feet as a parking space. The car wash drive through provides two lanes each spanning greater than 24-feet in length. Therefore, there are no additional parking stall requirements associated with the car wash use. Restaurants require one parking stall per every 250-square-feet of gross floor area, plus one RV space per every 20 required parking stalls. The drive-through tenant suite will include a total of 2,500-square-feet of gross floor area, which requires a total of ten-parking stalls and one RV stall (rounded to the nearest whole number). An additional undefined tenant type includes a total of 1,500-square-feet of space. It has been assumed by the project proponent that this suite will be used for some sort of restaurant or food and beverage retail sales. If this suite were to become a restaurant, then six-parking stalls will be required; if this suite were to be used for food and beverage retail sales, then approximately nine-parking stalls will be required. The project will be required to provide a total of between 27 to 30-parking stalls, plus one RV stall minimum. The project currently proposes a total of 49-parking stalls and four RV/Truck compliant parking stalls. As of current, the project will provide an excess of parking. In addition to the requirements contained in the Zoning Ordinance, there are also parking and loading standards contained in the Community Design Standards, Parking and Loading Standards (Exhibit H).

Signage: Table 130.36.070.1a. - Rural Area Signage Standards for Permanent On-Site Signs, General Commercial (GC) Zone allows one or more building attached signs per establishment based on floor area. Facilities that are less than 10,000-square-feet in floor area have a maximum building attached sign allowance of 50-square-feet. Integrated developments may include one multi-tenant sign per public street frontage as

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follows: (1) First street frontage of up to 80-square-feet of sign area standing at no more than 20-feet in height; (2) Other street frontage(s) of up to 40-square-foot sign area at no more than ten-feet in height (Exhibit G). The project site plans denote the location of three proposed signs, but provides no specific signage plans at this time. There is no currently existing signage on site.

Outdoor Lighting: The project does not currently include outdoor lighting proposals. However, it can be assumed that this project will include either standalone outdoor parking lot lighting sconces or building attached lighting aimed to illuminate the parking lot area. See Exhibit I for Outdoor Lighting Standards (10 pages).

Landscaping and Irrigation: The project currently does not propose landscaping. See Exhibit J for Landscaping and Irrigation Standards (41 pages).

**3. General Plan Land Use Designation Consistency:**

Objective 2.2.1 Land Use Designations designates the subject parcel Commercial (C) (Exhibit C). The C General Plan Land Use Designation is to provide a full range of commercial retail, office, and service uses to serve the residents, businesses, and visitors of El Dorado County. This designation is considered appropriate within Community Regions, Rural Centers, and Rural Regions.

General Plan Policy 2.2.5.21 – Development projects shall be located and designed in a manner that avoids incompatibility with adjoining land uses that are permitted by the policies in effect at the time the development project is proposed. Development projects that are potentially incompatible with existing adjoining uses shall be designed in a manner that avoids any incompatibility or shall be located on a different site.

General Plan Policies TC-Xa – TC-Xi – A full entitlement permit will be reviewed by DOT for consistency with these policies. A Transportation Impact Study – Initial Determination Form will be required to start DOT’s review.

General Plan Policy 5.1.2.1 – Requires a determination of the adequacy of the public services and utilities to be impacted by that development. The project cannot be fully reviewed for consistency with this policy. However, this will be required for full entitlement permits.

General Plan Policy 5.2.1.2 – Requires that adequate quantity and quality of water for all uses, including fire protection, be provided with proposed development. The project has not yet been fully reviewed for consistency with this policy. However, this will be required for full entitlement permits.

General Plan Policy 6.2.3.2 – Requires the applicant demonstrate that adequate access exists, or can be provided, to ensure that emergency vehicles can access the site and private vehicles can evacuate the area. The project has not yet been fully reviewed for consistency with this policy. However, this will be required for full entitlement permits.

**4. Agency Comments:**

El Dorado Environmental Management Department (EMD): Comments were received March 3, 2022 (Exhibit K). Facilities that sell food at the retail level are required to be built and operated according to the standards of the California Retail Food Code. A plan review approval granted by EMD will be required prior to building and of the proposed facilities. Once approval has been granted and the facilities are built and ready to operate, an annual health permit will be required and routine inspections will be conducted for the facilities. Records on file show that the parcel does not have public sewer access available. The proposed project will require an onsite wastewater treatment system to dispose of sewage and other wastewater created by the convenience store, restaurant, and other proposed facilities. Restaurants and other facilities that produce grease are required to have

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a 500-gallon minimum grease interceptor installed between the facility and the septic tank. Commercial facilities are required to identify a minimum 300-percent repair area to allow for future repairs of the septic system. The facility, as designed, will store reportable quantities of hazardous materials and generate hazardous waste. The facility will be required to submit the appropriate documentation into California Environmental Reporting System (CERS) and obtain CUPA permit from Environmental Management prior to dispensing fuel. State law mandates that a minimum of 65-percent of the waste materials generated from covered Construction and Demolition projects must be diverted from being landfilled by being recycled or reused on site. State law requires that all non-residential dwellings that generate at least two cubic yards of solid waste per week to have a recycling project for common recyclable materials such as bottles, cans, and paper. State law requires that all non-residential dwellings generating at least two cubic yards of solid waste per week to have an organics recycling program for the following types of organic wastes: green waste, landscape, and pruning waste, non-hazardous wood waste, food waste, and food-soiled paper. Recycling by occupants requires that new project provide readily accessible areas that serve the entire building and are identified for the depositing, storage, and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

El Dorado County Air Quality Management District (AQMD): Comments were received February 16, 2022 (Exhibit L). An Air Quality and Greenhouse Gas (GHG) Analysis is required for adequate environmental review of the proposed project. AQMD recommends the use of the latest version of the California Emissions Estimator Model (CalEEMod). While AQMD has not adopted GHG thresholds of significance, we recommend using Sacramento Metropolitan AQMD's (SMAQMD) GHG thresholds. Additionally, standard conditions to be placed on the project include asbestos dust, paving, painting/coating, construction emissions, portable equipment, new point sources, designated parking for clean air vehicles, and electric vehicle charging.

El Dorado County Storm Water Division: Comments were received February 1, 2022 (Exhibit M). The project would be subject to standard storm water conditions. Minimal impacts are expected; however, if the project will create or replace 5,000-square-foot or more of impervious surface, then the project must comply with the County's post construction water quality requirements. An Erosion and Sediment Control Plan will need to be included in the plan submittal. If the project will disturb an acre or more of land, the project proponent will be required to obtain Construction General Permit (CGP) coverage through the State Water Resources Control Board. The CGP requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

El Dorado County Surveyor Department: Comments were received February 10, 2022 (Exhibit O). The project will be subject to two standard conditions of approval. First, site addressing for the project will need to be coordinated with the County Surveyor's Office. Second, all disturbed boundary monuments must be reset by a Professional Land Surveyor or Qualified Engineer.

California Regional Water Quality Control Board: Comments were received February 10, 2022 (Exhibit N). A Report of Waste Discharge from Nella Oil has been received and Cool Village is seeking an El Dorado County permit for proposed development in the small community of Cool at the junction of Highway 193 and 49. Subsurface wastewater disposal as proposed will be difficult because the area is characterized by shallow soil with slow percolation rates and high groundwater. Due to these issues, staff requested that El Dorado County consider off-site disposal and a community collection system for the development of this area.

Department of Transportation (DOT): Comments were received March 3, 2022 (Exhibit P). A Traffic Impact Study (TIS) will be required for the formal project. At project submittal, the applicant should fill out and submit a Traffic Impact Study – Initial Determination (TIS-ID0 form. Primary access is proposed to both SR49 and

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SR193. Caltrans District 3 will be asked to review the traffic study and access locations. Note that the County's Class One Bike Path along SR193 must be preserved, or may be modified as allowed by Caltrans District 3 to accommodate the proposed driveway. A list of standard conditions was provided by DOT for purposes of providing a greater understanding of general concerns resulting from projects of this type.

California Department of Transportation: Comments were received March 3, 2022 (Exhibit Q). The project will need to show how the light pole(s) and signage will be dealt with at the North/East corner of the intersection. Pages two and three in the exhibits package document shows the south driveway on the eastern side of the plot; however, page four shows the southern driveway on the west side of the plot. At least four ADA spots are required due to the 76 parking spots mentioned in the parking calculations. Truck turning template will be required and will need to indicate the type of trucks that will be resupplying the store and denote how right turn truck maneuvers will be addressed from Georgetown Road to SR49. Show dimensions for Northside Drive, including taper width. Lane widths need to be called out at the entrance of the store. The amount of trips estimated per day that are expected for this development must be provided. Building a Class II bike lane on SR49 is recommended. This will close the gap from the bike path along SR193 to the approved Class II bike lane just south of Northside Drive. The driveway on SR193 will need to be constructed to commercial driveway standards. There are future plans to improve the intersection of SR49 and SR193, possibly with a signal or roundabout. Fair share fees should be collected to contribute to the intersection improvements. If the proposed work encroaches into Caltrans R/W or impacts a State Highway, the proposed work requires an encroachment permit. In order to ensure timely processing of a Caltrans Encroachment permit, the applicant must study all relevant environmental issues within the State's right of way that are likely to be affected.

Cool/Pilot Hill Advisory Committee (CPHAC): Comments were received March 2, 2022 (Exhibit R). A variety of concerns were raised within the CPHAC comment sheet. Many issues raised ranging from access/circulation to fire safety would be reviewed and decided upon by the pertinent reviewing agency or department(s). Additional concerns including the potential need for back-up generators, lack of photometrics, and lack of complete information for environmental review. The project will be required to show the location of any back-up generators, provide photometrics, and provide any pertinent environmental reports and studies for the full entitlement submittal. The project will be required to be heard at the CPHAC to determine consistency with the County's Design Guidelines in effect at the time of project review.

**5. Staff Observations and Notes**

- A. **Discretionary Permit / Environmental Analysis**: At this time, the processing of a discretionary permit and associated environmental analysis will be required given the project site is located within a County Community Design Review Overlay. A full entitlement permit review will result in an environmental impact review pursuant to the provisions of the California Environmental Quality Act (CEQA). A determination regarding the exact CEQA requirements cannot be made at this time, but may include an exemption, Initial Study preparation, or a full Environmental Impact Report (EIR).

**6. Suggestions and Recommendations**

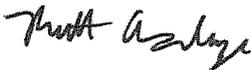
**7. Summary and Limits of Staff Response:**

This summary concludes the initial review of the Pre-Application (PA21-0021) for a proposed 8,500-square-foot commercial structure which will house a 4,500-square-foot C-Store convenience gas station, a 2,500-square-foot drive-thru restaurant, and a 1,500-square-foot non-drive thru tenant. The site will include additional facilities including a 1,892-square-foot carwash, 3,024-square-foot automobile fuel canopy covering six-gas-pumps, and a 2,016-square-foot truck and RV fuel canopy covering three-gas-pumps on a 3.83-acre general commercial zoned property located at the intersection between State Highway 49 and State Highway 193 in the Cool Rural

Center. Although each of the declared and expected uses are allowed by right uses, the site sits within a design review overlay. As such, the project will require approval of a design review permit. The scope of this permit will be focused on design aesthetic concerns associated with both the proposed structures and overall site layout design. However, there may be specific portions that involve other aspects of the site including a bike path determination from Caltrans District Three. As of now, now uses which would require additional entitlements have been proposed. However, there are other uses allowed on this site with approval of a use permit. If any of these uses should be proposed in the future, this would result in a discretionary review of the site. This summary is not an approval of any permits or of actual conditions. Additional requirements may be required at time of submittal of any official Discretionary Planning or Building Permit Application.

If you have any questions regarding this summary, please feel free to contact Matthew Aselage at (530) 621-5977 or [Matthew.Aselage@edcgov.us](mailto:Matthew.Aselage@edcgov.us)

Respectfully,



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