

Memorandum

To: Jack Varozza, P.E., QSD
Senior Engineer, City of Roseville

From: Olivia Potash, EIT
Matt Weir, P.E., T.E., PTOE, RSP₁

Re: *Fairway Drive Coffee Kiosk*
Traffic Evaluation
Roseville, California

Date: January 20, 2021

Per your request and authorization, we have prepared this traffic evaluation for the above referenced project.

Project Understanding

Kimley-Horn understands that a drive-thru coffee kiosk is proposed as an outparcel at 10001 Fairway Drive (Home Depot) (see **Exhibit 1**). The proposed project consists of an approximately 860-square foot building, 16 onsite parking stalls, and a drive-thru lane that is indicated to accommodate approximately 425-feet (21 vehicles, 20-feet per vehicle) of storage (see **Exhibit 2**). Immediately adjacent access to the proposed project will be from one right-in/right-out driveway and one full-access signalized intersection along Fairway Drive. Additional access is achieved through the existing shopping center and its broader connectivity to Fairway Drive, Five Star Boulevard, and Stanford Ranch Road.

The purpose of this analysis is to evaluate the proposed project's access, to determine the amount of storage and/or access modifications that are necessary to ensure safe and efficient operations, and to approximate and confirm adequate drive-thru storage. This analysis largely relies on a trip generation study (unique trip generation rate, drive-thru queuing rate, etc.) for similar coffee kiosk businesses previously developed by Kimley-Horn.

Study Facilities and Evaluation Parameters

The following two intersections (see **Exhibit 3**) are included in this access evaluation. **Exhibit 3** details the study intersections' geometries while **Exhibit 4** details the peak-hour volumes. Traffic counts are provided in **Attachment A**. For each location, traffic/access control and the primary evaluation parameter(s) are also specified.

1. Fairway Drive @ Site Access Driveway
 - Access is right-in/right-out only
 - Primary considerations are the interaction between on- and off-site vehicle queuing and access, general driveway operations, the influence of the downstream intersection with the Home Depot Driveway, and the minimum required throat depth (MRTD)
2. Fairway Drive @ Home Depot Driveway
 - Existing traffic signal
 - Primary consideration is anticipated mix of volumes with project volumes, with a focus on the left-turn movements associated with the project site, interaction between on- and off-site vehicle queuing and access, and general driveway operations



The access evaluation was conducted for the weekday AM and PM peak-hours for the following conditions:

- A. Existing (2020 pre-COVID) Conditions plus Proposed Project

Methods defined in the *Highway Capacity Manual (HCM), 2000* and *2016*, using appropriate traffic analysis software, were applied. *Highway Capacity Manual, 2000* was used to analyze the signal timing parameters at the intersection of Fairway Drive with the Home Depot Driveway (Intersection #2) due to the intersection operation’s incompatibility with *HCM 2016*.

Assessment of Proposed Project

Trip Generation

In support of this traffic evaluation, Kimley-Horn completed a trip generation study in a manner consistent with the methodology contained the *Trip Generation Manual, 10th Edition*, published by the Institute of Transportation Engineers (ITE). According to ITE, five sites are preferred (three minimum) to complete this study. Using the square footages (gross floor area) for three sample locations with drive-thru facilities (Dutch Bros., 3450 Sunset Boulevard – Rocklin; Dutch Bros., 1225 Baseline Road – Roseville; Dutch Bros., 715 Sunrise Avenue – Roseville), we developed a unique local trip generation rate (trips per thousand square feet). Furthermore, we collected 15-hour (6:00 AM – 9:00 PM) drive-thru queuing traffic data which enabled us to identify the sample sites’ actual peak-hour of generator volumes to be more conservative in the subsequent analysis of the weekday AM and PM peak-hour operations (layering the sites’ peak-hour of generator on the weekday AM and PM peak-hours as if they occurred at the same time). The data associated with this evaluation are presented in **Table 1**.

Table 1 – 2020 Trip Generation Data

Location	Size (ksf)	Peak-Hour of Generator				Max Queue
		Ins	Outs	Total	Peak-Hour	
Dutch Bros, Sunset Blvd (2020)	0.45	89	80	169	1:40pm - 2:40pm	10
Dutch Bros, Baseline Rd (2020)	0.86	66	69	135	8:15am - 9:15am	19
Dutch Bros, Sunrise Ave (2020)	1.25	61	59	120	2:40pm - 3:40pm	13
<i>Calculated Rate (#trips/ksf):</i>		<i>105</i>	<i>105</i>	<i>210</i>		
Proposed Project	0.86	90	90	180		
<i>Pass-by Reduction (70%):</i>		<i>-63</i>	<i>-63</i>	<i>-126</i>		
Net new trips:		27	27	54		

Note: Pass-by reduction is per City of Roseville

The aforementioned data used in the previous trip generation study for similar coffee kiosk businesses is presented in **Table 2**. In 2016, the Baseline Road site had a peak-hour of 8:00 AM – 9:00 am. Similarly, in 2020, the Baseline Road site has a peak-hour of 8:15 AM – 9:15 AM. Of note, the 2020 data indicates the drive-thru ins and outs have decreased since 2016 (presumably as a result of the on-going COVID-19 pandemic), while the maximum queue length has increased.

Table 2 – 2016 Trip Generation Data

Location	Size (ksf)	AM Peak-Hour			Peak Hour	Max Queue
		Ins	Outs	Total		
Dutch Bros, Sunset Blvd (2016)	0.45	110	117	227	7:00am - 8:00am	12
Dutch Bros, Baseline Rd (2016)	0.86	84	92	176	8:00am - 9:00am	13
Starbucks, Pleasant Grove Blvd (2016)	0.50	73	70	143	7:30am - 8:30am	17
<i>Calculated Rate (#trips/ksf):</i>		<i>166</i>	<i>166</i>	<i>332</i>		
Proposed Project	0.80	133	133	266		
<i>Pass-by Reduction (70%):</i>		<i>-93</i>	<i>-93</i>	<i>-186</i>		
Net new trips:		40	40	80		

Note: Pass-by reduction is per City of Roseville

We recognize that the sample sites’ data collected in 2020 is during the COVID-19 global pandemic and the associated governmental restrictions on business operations and personal travel. As shown above, we have data from 2016 and 2020. The 2016 data presented in **Table 2** is limited to the weekday AM peak-hour. The 2020 data spans 15-hours of a typical weekday. We calculated the 2020 AM, PM, and peak-hour of generator trip rates and selected the 2020 peak-hour of generator for use in this study to be conservative. In addition to enabling the identification of the sites’ peak-hour of generator, the 15-hours of data enabled the identification of weekday maximum drive-thru queues. This strategy (applying the peak-hour of generator trip data and observing 15-hours of drive-thru operations) is considered to be an appropriate approach to using 2020 COVID-19 condition data in this evaluation.

The data contained in **Table 1** indicate that the weighted average of the sample sites’ data (weighted by the sites’ square footage) is 210 total peak-hour of generator trips (105 in and 105 out) per thousand square feet (ksf). Using this unique, local rate and an appropriate pass-by reduction as provided by the City of Roseville¹, the proposed project is anticipated to generate 27 new in, and 27 new out trips during the peak-hour of generator. However, the proposed project’s 180 total peak-hour trips are used to approximate driveway volumes and intersection operations in this analysis. Finally, the data collected show an average maximum drive thru queue of 14 vehicles (approximated to be 280-feet, assuming each vehicle is 20-feet in length). This average maximum drive-thru queue length of 280-feet is less than the project’s proposed vehicle storage of 425-feet.

Trip Distribution

The distribution of project traffic was developed based on existing project area roadway volumes, general knowledge of project area traffic patterns, and engineering judgement. Project trips were assigned to the study intersections and the surrounding roadway network according to this distribution. Weekday AM and PM peak-hour volumes for Existing and Existing (2020) plus Proposed Project Conditions are reflected in **Exhibit 4**.

Traffic Assessment

As previously discussed, the purpose of this analysis is to evaluate the proposed project’s access points, to determine the amount of storage and/or driveway treatments that are necessary to ensure safe and efficient operations, and to approximate and confirm adequate drive-thru storage.

This traffic evaluation included consideration of vehicle queuing entering the site and the Minimum Required Throat Depth (MRTD) at the Fairway Drive site driveway (right-in/right-out). For this evaluation, the City’s guidelines² were referenced to determine the driveway’s MRTD for egressing vehicles.

¹ Email from Jack Varozza, City of Roseville, January 14, 2021.

² *Section 4 Traffic Impact Studies, City of Roseville Design Standards*, January 2016.

Additionally, Synchro was used to evaluate the anticipated operations at the adjacent signalized study intersection of Fairway Drive and the Home Depot Driveway (Intersection #2).

Minimum Required Throat Depth (MRTD)

The MRTD was calculated for the Fairway Drive right-in/right-out site driveway (Intersection #1). **Table 3** summarizes the findings of the MRTD evaluation based on the City’s guidelines².

Table 3 – MRTD for Fairway Drive @ Site Access Driveway (Intersection #1)

INT	Peak-Hour	TS	ConfVol (Left)	ConfVol (Right)	AppVol (RT In)	RT%	Minimum Required Throat Depth (MRTD)	Available Storage
1	AM	1	0	510	45	100%	75	100
	PM	1	0	889	152	100%	125	

Note: All volumes come from the Existing plus Proposed Project scenario

The existing, available throat depth for Intersection #1 is observed to be approximately 100-feet. As shown in **Table 3**, the MRTD is 75-feet and 125-feet in the AM and PM peak-hours, respectively. Thus, Intersection #1 does not satisfy the MRTD during the weekday PM peak-hour. To assist in mitigating this deficiency, it is recommended that “KEEP CLEAR” and/or other pavement markings and signage be installed to discourage egressing vehicles from blocking the adjacent drive aisle. **Exhibit 5** indicates the approximate location of the “KEEP CLEAR” pavement marking and pavement hatching. Vehicles may queue in the additional storage area located on the site access driveway south of the first drive aisle (farther away from Fairway Drive).

In order to mitigate the potential for the 125-feet of vehicle queuing to wrap around and block the drive-thru output lane, it is recommended that similar signing and striping be added to keep this area clear as well. It is noted that, if there is no available egress storage at Intersection #1, vehicles exiting the drive-thru would likely continue straight (away from Fairway Drive) and then navigate to Intersection #1 or Intersection #2 to exit the Home Depot parking lot.

Signalized Intersection Queuing and Operations

In an effort to assess onsite operations and to confirm if the operations at the intersection of Fairway Drive with the Home Depot Driveway (Intersection #2) affect the project’s Fairway Drive site driveway (Intersection #1), Synchro was used to determine the anticipated delay, Level of Service (LOS), and 95th percentile vehicle queues under Existing plus Project Conditions. **Table 4** summarizes the delay and LOS at the intersection while summarizes the queuing for select movements. Analysis worksheets are provided in **Attachment B**.

Table 4 – Intersection Level of Service for Existing plus Proposed Project Conditions

ID	Intersection	Control	Peak Hour	Existing (2020) plus Proposed Project	
				Delay (sec)	LOS
2	Fairway Drive @ Home Depot Driveway	Signal	AM	22.6	C
			PM	23.0	C

Table 5 – Intersection Queuing for Existing plus Proposed Project Conditions

Intersection / Analysis Scenario	Movement	Available Storage (ft)	95th % Queue (ft)	
			AM Peak-Hour	PM Peak-Hour
#2, Fairway Drive @ Home Depot Driveway	NBL			
	Existing (2020) plus Proposed Project	115	91	142
	EBR			
	Existing (2020) plus Proposed Project	205	49	53
	WBL			
	Existing (2020) plus Proposed Project	240	70	80

Source: *Highway Capacity Manual (HCM)* methodology per Synchro[®] v10

As shown in **Table 4**, the intersection operates acceptably according to the City’s guidelines. **Table 5** indicates that the northbound left queuing extends past the first drive aisle in the Home Depot Driveway. In addition, the City provided videos of the intersection of Fairway Drive with the Home Depot Driveway from 10:00 AM – 12:00 PM on December 5, 2020 to confirm this onsite queuing activity. Over the course of the two-hour span, the northbound left-turn queue extended past the first drive aisle 11 total times. However, in that two-hour span, vehicles on Fairway Drive were able to enter the Home Depot Driveway without apparent spillback onto Fairway Drive. It is anticipated with the addition of the proposed project, entering vehicles that would use the Home Depot driveway would not cause spillback into the public right-of-way. Nevertheless, it is recommended that “KEEP CLEAR” and/or other pavement markings and signage be installed to discourage egressing vehicles from blocking the adjacent drive aisles. Furthermore, it is recommended to mark the area at the entrance to the drive-thru with pavement hatching to emphasize the need to keep this area clear and maintain efficient drive-thru operations. **Exhibit 5** provides the approximate location of the “KEEP CLEAR” pavement marking and pavement hatching.

Emergency Vehicle and Refuse Service Access

The site plan in **Exhibit 2** was qualitatively reviewed for emergency vehicle and refuse service access. The project site appears to include adequate access around the building to accommodate emergency vehicles. Adequate access and circulation is provided for refuse services to access the onsite refuse location depicted in **Exhibit 2**. The project is considered to allow for adequate general access and circulation for emergency vehicles and refuse services within the broader shopping center based on the site’s location within the existing Home Depot parking lot.

Conclusions

The following are the primary conclusions based on the analyses discussed herein:

- *City of Roseville MRTD standards are not achieved at the site access driveway along Fairway Drive (Intersection #1)* – It is recommended that “KEEP CLEAR” and/or other pavement markings and signage be installed to discourage egressing vehicles from blocking the adjacent drive aisle. In order to mitigate the potential for the 125-feet of vehicles to wrap around and block the drive-thru output lane, it is recommended that similar signing and striping be added to keep this area clear as well.
- *The drive-thru length is expected to be adequate for typical queues* – based on the sample sites’ observed queuing data, it is expected that the provided drive-thru queue length will be adequate. Any queue spillbacks are expected to be contained within the immediate site’s facilities.
- *Queueing past the drive aisle at the Home Depot Driveway* – queueing along the Home Depot Driveway was noted as often extending past the first drive aisle in the AM and PM peak-hours.

Based on video observation, it is anticipated with the addition of the proposed project, entering vehicles that would use the Home Depot driveway, would not cause spillback into the public right-of-way. Nevertheless, it is recommended that “KEEP CLEAR” and/or other pavement markings and signage be installed to discourage egressing vehicles from blocking the adjacent drive aisles. Furthermore, it is recommended to mark the area at the entrance to the drive-thru with pavement hatching to emphasize the need to keep this area clear and maintain efficient drive-thru operations.

- *Emergency vehicle and refuse service access is provided* – based on the project’s site plan and location in the existing Home Depot parking lot, adequate access for emergency vehicles and refuse service appear to be provided onsite.

Attachments:

Exhibit 1 – Vicinity Map

Exhibit 2 – Preliminary Site Plan

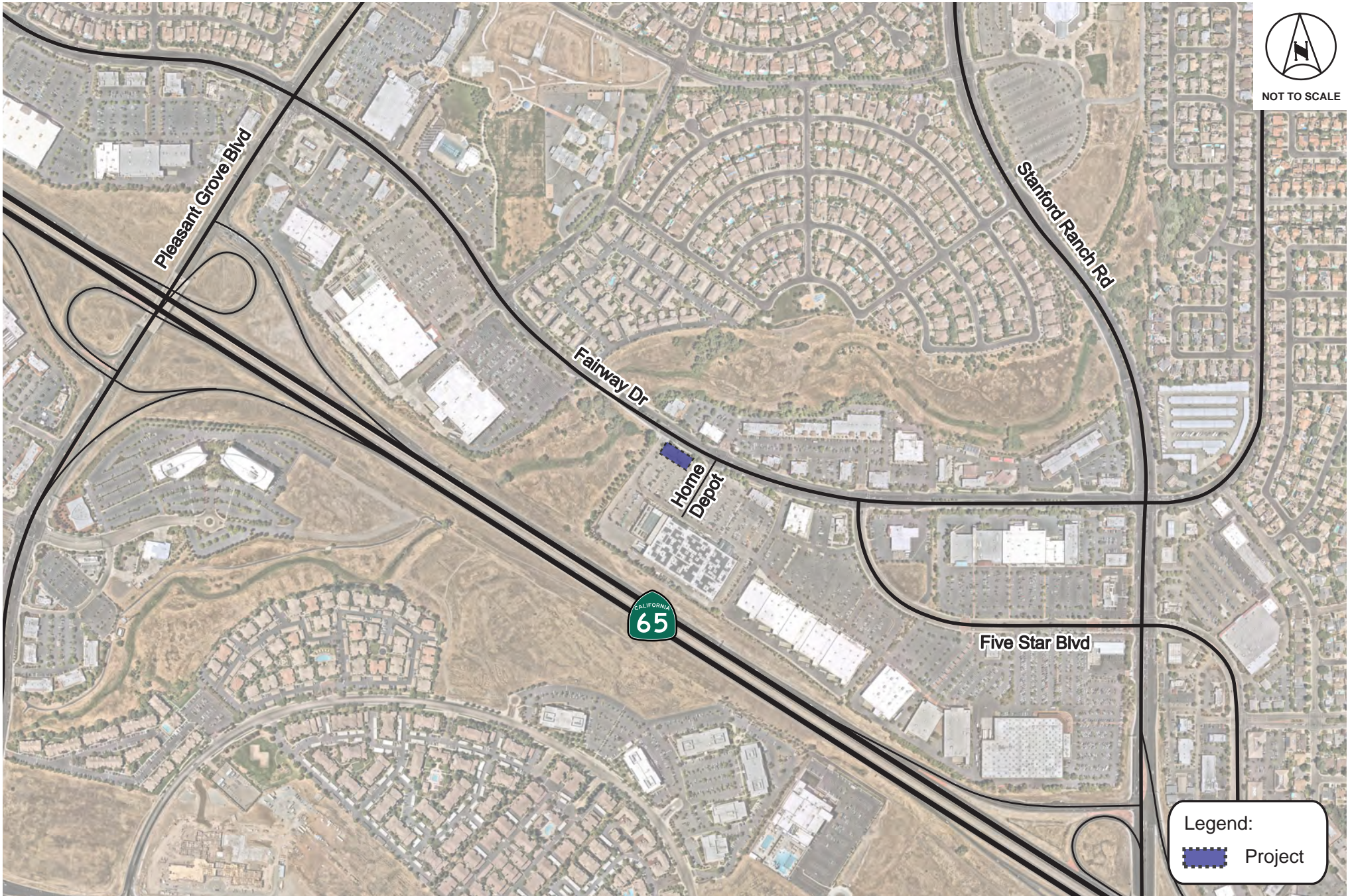
Exhibit 3 – Study Intersections, Traffic Control, and Lane Geometries

Exhibit 4 – Existing (2020) and Existing (2020) plus Proposed Project Peak-Hour Volumes

Exhibit 5 – Pavement Markings Concept

Attachment A – Traffic Count Data Sheets

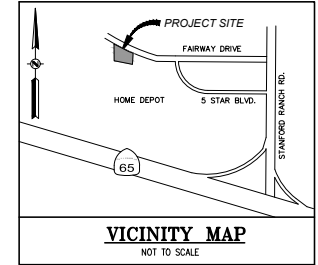
Attachment B – Analysis Worksheets



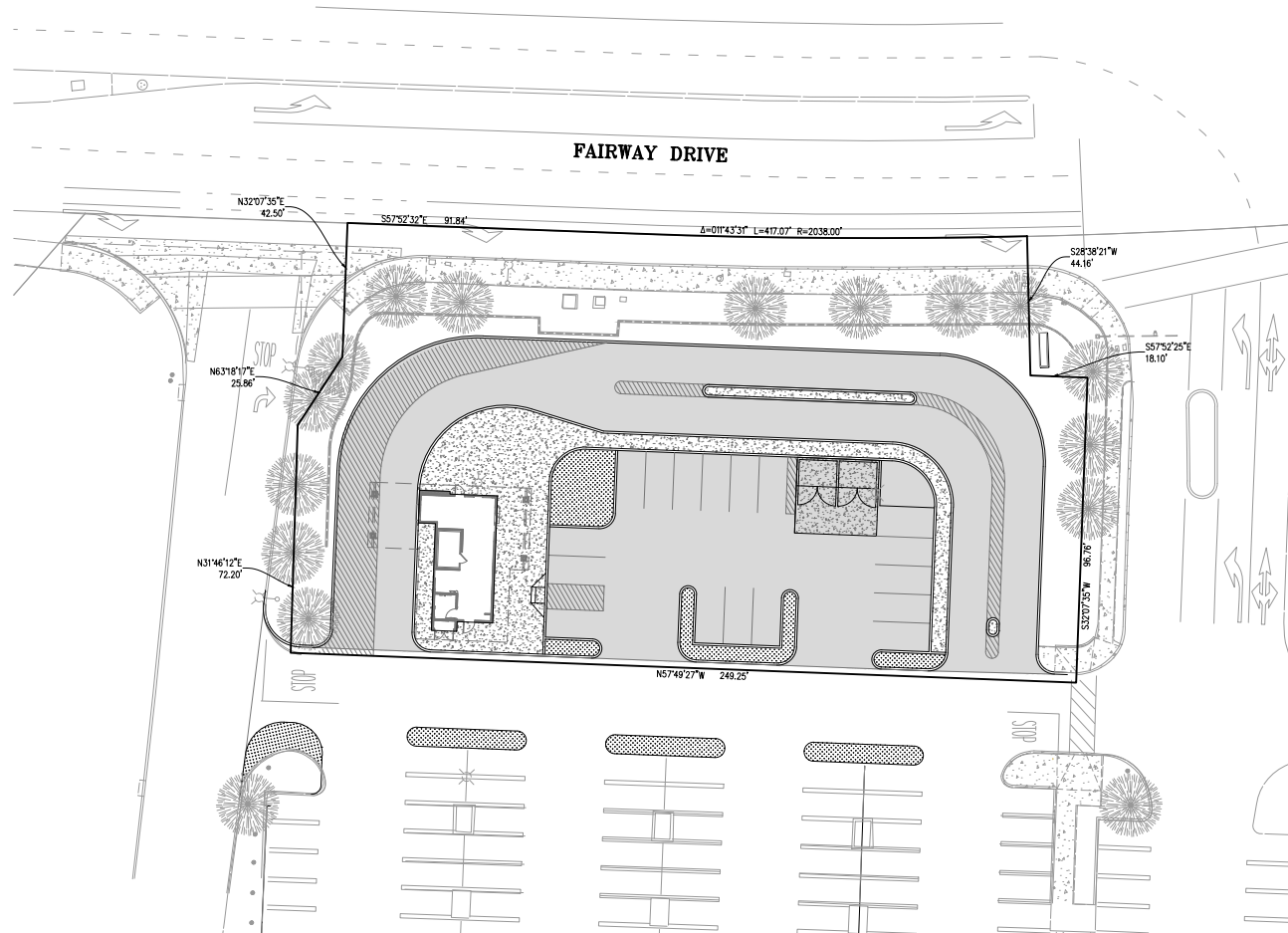
PRELIMINARY SITE PLAN FOR:



CITY OF ROSEVILLE, CALIFORNIA
NOVEMBER 10, 2020

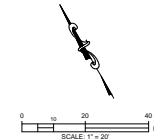


LEGEND	
	PROPERTY LINE
	PROPOSED SIDEWALK
	PROPOSED ASPHALT PAVEMENT
	PROPOSED LANDSCAPE AREA



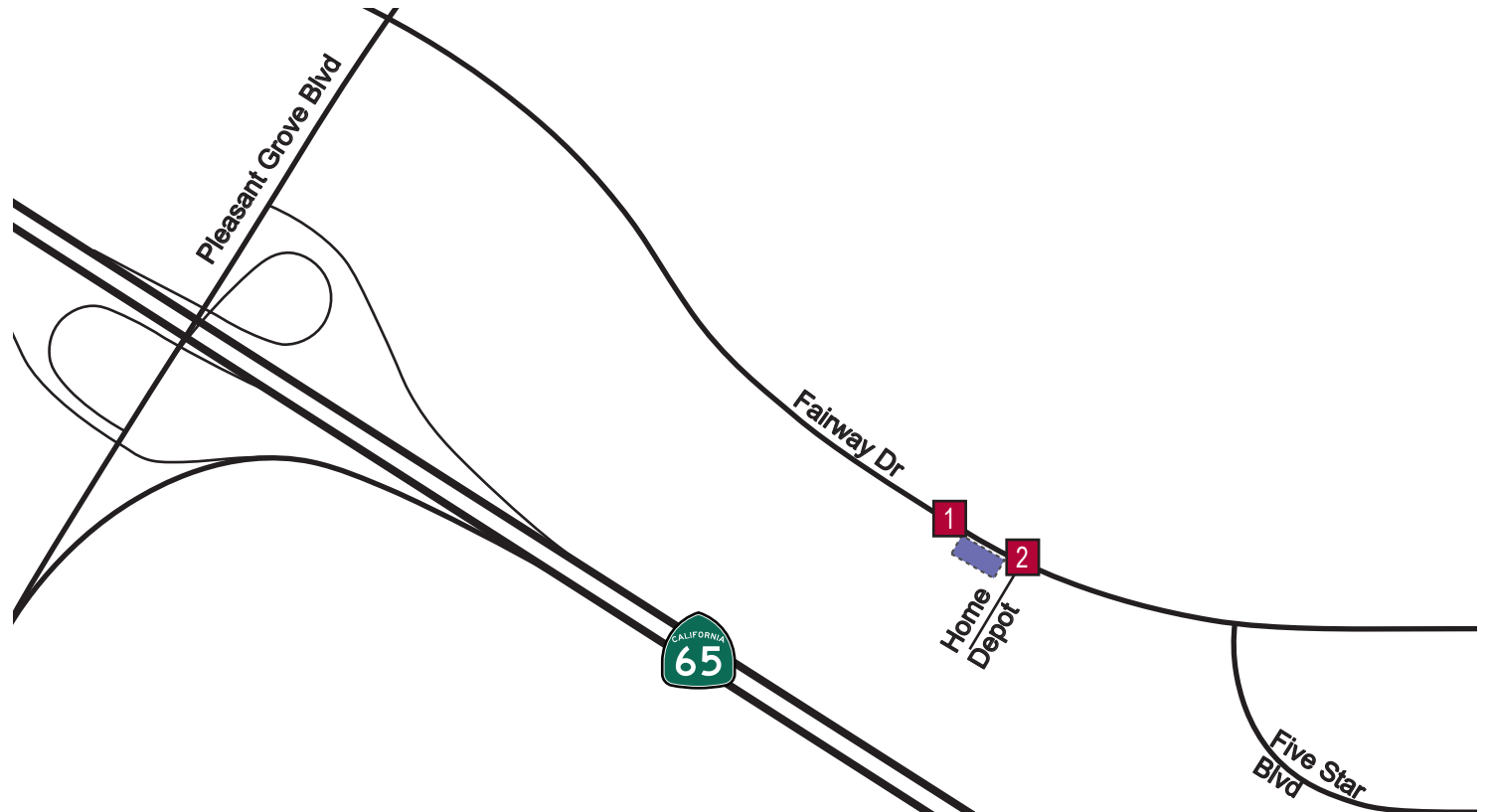
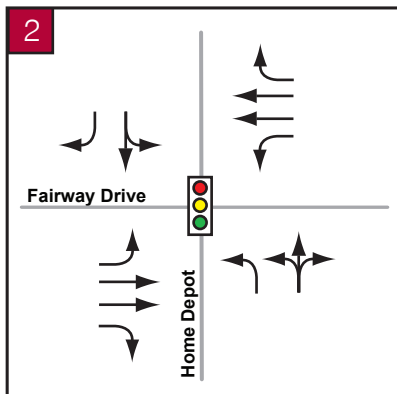
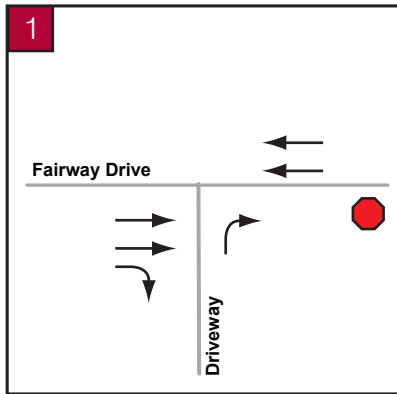
SITE STATISTICS

LAND AREA	AREA	% OF SITE	PARKING	
			EXISTING SPACES	PROPOSED SPACES
ASPHALT PAVEMENT			STANDARD	STANDARD
CONCRETE SIDEWALK			ADA	ADA
BUILDING (FOOTPRINT)			EV	EV
LANDSCAPING			TOTAL	TOTAL





NOT TO SCALE

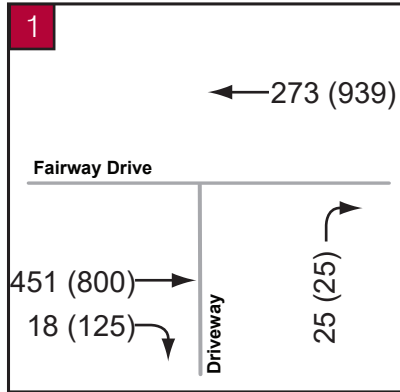


LEGEND	
#	Study Intersection
[Blue hatched box]	Project
[Traffic light symbol]	Signalized Study Intersection
[Red octagon symbol]	Stop-controlled Approach

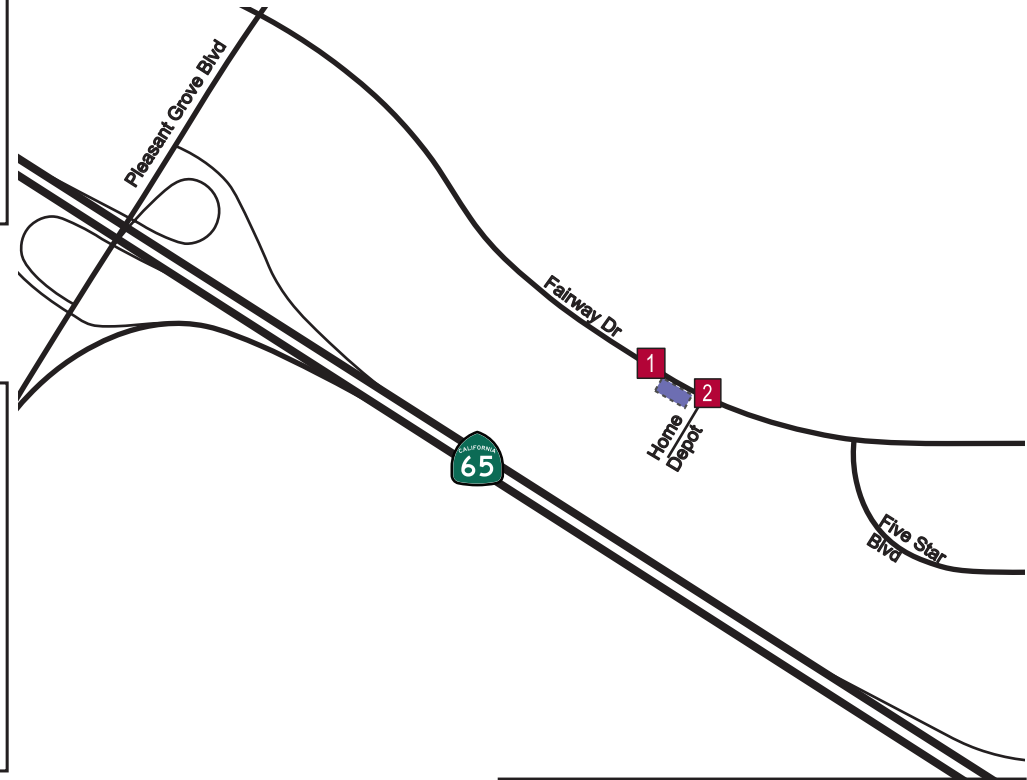
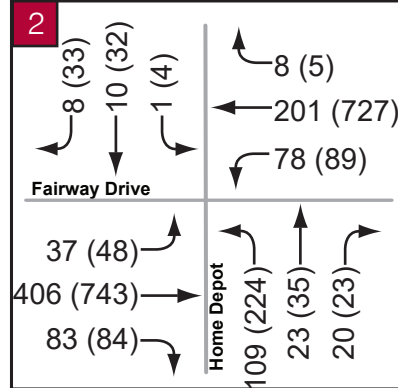
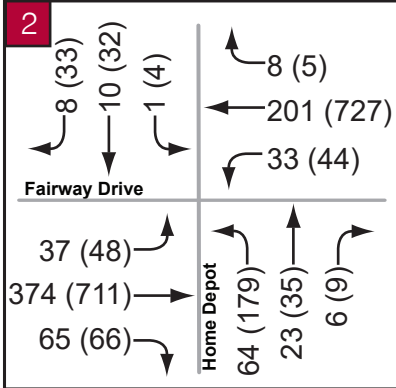
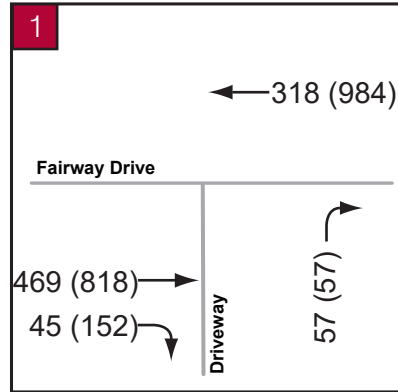


NOT TO SCALE

Existing (2020)

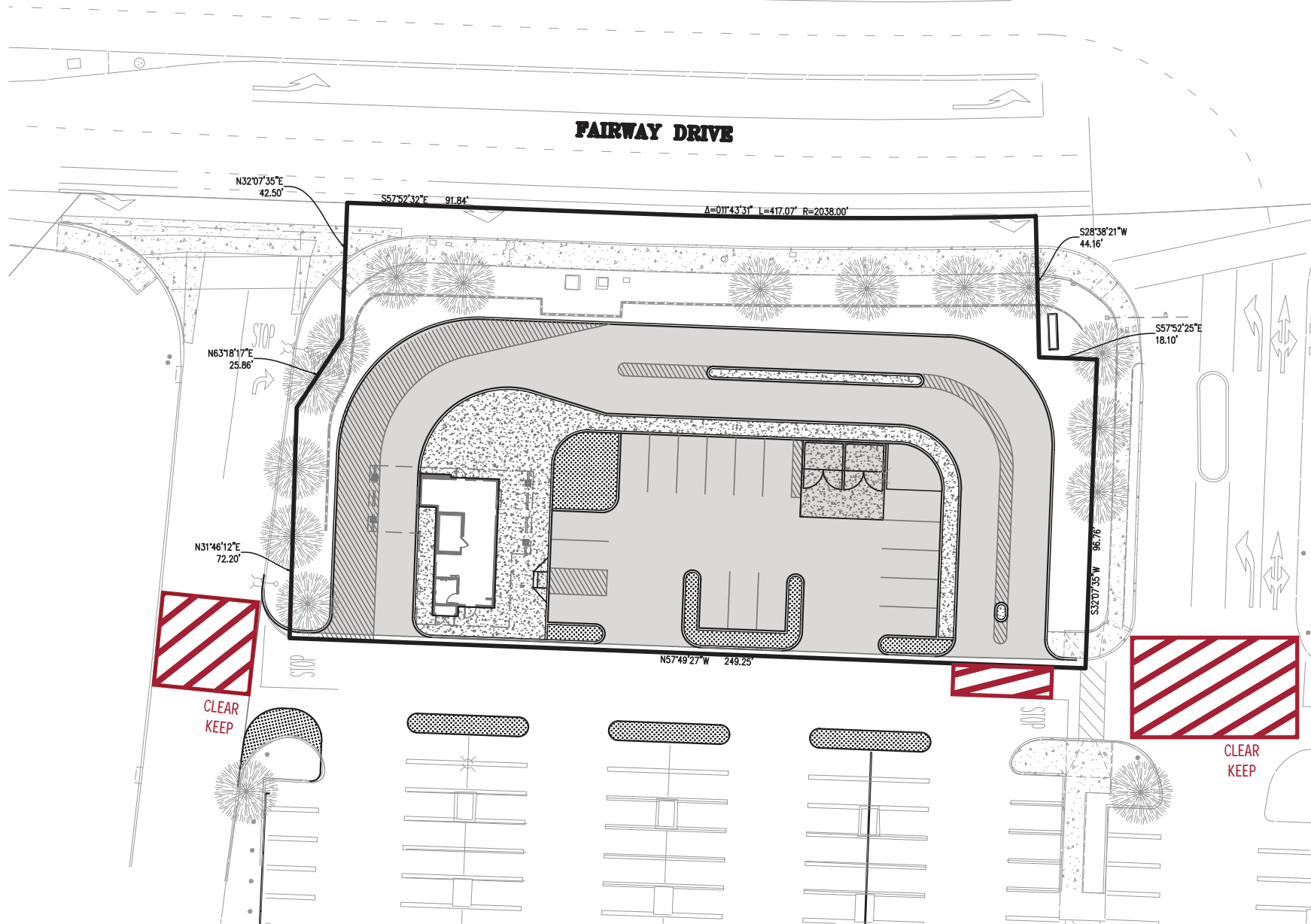


Existing (2020)
plus Proposed Project



LEGEND

- # Study Intersection
- Project
- ## (##) AM (PM) Peak-Hour Volume



Note: Concept is provided for illustrative purposes only.

Attachment A
Traffic Count Data Sheets

Attachment 1

Turning Movement Volume Report

Report Date: 12/18/2020 7:52:13 AM

From 2/18/2020 to 2/20/2020

Fairway & Home Depot
(332)

Intersection: 111

Time	NW				SE				NE				SW				Int Total
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	
18/02/20 00:00-01:00	0	23	0	23	1	20	0	21	0	0	0	0	0	3	0	3	47
18/02/20 01:00-02:00	0	12	0	12	1	13	0	14	0	0	0	0	0	2	2	4	30
18/02/20 02:00-03:00	0	7	0	7	1	6	0	7	0	0	0	0	0	1	1	2	16
18/02/20 03:00-04:00	3	12	0	15	0	18	0	18	0	0	0	0	0	1	1	2	35
18/02/20 04:00-05:00	0	10	0	10	1	19	2	22	1	1	0	2	0	2	0	2	36
18/02/20 05:00-06:00	4	26	0	30	0	32	6	38	1	2	0	3	0	0	0	0	71
18/02/20 06:00-07:00	9	70	0	79	3	98	11	112	13	2	1	16	0	1	0	1	208
18/02/20 07:00-08:00	16	128	3	147	13	209	32	254	21	4	1	26	0	4	4	8	435
18/02/20 08:00-09:00	31	200	7	238	37	368	42	447	69	16	4	89	1	8	7	16	790
18/02/20 09:00-10:00	55	283	5	343	46	556	91	693	109	23	6	138	3	22	28	53	1227
18/02/20 10:00-11:00	83	474	4	561	72	640	95	807	160	42	11	213	4	34	30	68	1649
18/02/20 11:00-12:00	90	598	10	698	67	735	91	893	202	58	16	276	5	37	32	74	1941
18/02/20 12:00-13:00	75	601	6	682	58	774	108	940	223	50	13	286	6	48	46	100	2008
18/02/20 13:00-14:00	83	666	11	760	66	760	102	928	226	60	16	302	6	44	43	93	2083
18/02/20 14:00-15:00	82	647	7	736	50	702	96	848	228	53	14	295	5	38	34	77	1956
18/02/20 15:00-16:00	62	609	6	677	43	748	74	865	202	44	12	258	5	44	40	89	1889
18/02/20 16:00-	64	586	3	653	46	739	74	859	167	45	12	224	5	44	56	105	1841

Attachment 1

Turning Movement Volume Report

Report Date: 12/18/2020 7:52:13 AM

From 2/18/2020 to 2/20/2020

Fairway & Home Depot
(332)

Intersection: 111

Time	NW				SE				NE				SW				Int Total
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	
17:00																	
18/02/20 17:00-18:00	44	649	6	699	28	731	86	845	215	36	10	261	4	28	31	63	1868
18/02/20 18:00-19:00	33	551	3	587	40	623	66	729	147	34	9	190	3	26	38	67	1573
18/02/20 19:00-20:00	32	385	10	427	24	406	46	476	124	23	6	153	3	25	27	55	1111
18/02/20 20:00-21:00	12	277	1	290	18	213	30	261	65	12	3	80	3	20	21	44	675
18/02/20 21:00-22:00	8	153	4	165	7	127	19	153	32	7	2	41	1	9	7	17	376
18/02/20 22:00-23:00	0	60	0	60	3	74	3	80	21	5	1	27	1	4	4	9	176
18/02/20 23:00-00:00	0	34	1	35	3	45	1	49	3	1	0	4	0	2	2	4	92
19/02/20 00:00-01:00	1	28	0	29	0	25	0	25	1	0	0	1	0	2	1	3	58
19/02/20 01:00-02:00	0	10	0	10	1	10	0	11	1	0	0	1	0	3	3	6	28
19/02/20 02:00-03:00	0	2	0	2	0	7	0	7	0	0	0	0	0	0	0	0	9
19/02/20 03:00-04:00	0	10	0	10	0	15	0	15	1	0	0	1	0	1	1	2	28
19/02/20 04:00-05:00	0	11	0	11	1	19	2	22	0	1	0	1	0	1	0	1	35
19/02/20 05:00-06:00	4	31	0	35	2	39	6	47	3	1	0	4	0	0	0	0	86
19/02/20 06:00-07:00	7	67	1	75	5	93	24	122	10	5	1	16	0	2	3	5	218
19/02/20 07:00-08:00	18	130	1	149	20	215	24	259	37	7	2	46	0	3	4	7	461
19/02/20 08:00-09:00	28	195	3	226	28	354	47	429	56	15	4	75	1	12	12	25	755

Attachment 1

Turning Movement Volume Report

Report Date: 12/18/2020 7:52:13 AM

From 2/18/2020 to 2/20/2020

Fairway & Home Depot
(332)

Intersection: 111

Time	NW				SE				NE				SW				Int Total
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	
19/02/20 09:00-10:00	45	303	4	352	48	533	66	647	95	21	6	122	2	18	22	42	1163
19/02/20 10:00-11:00	61	407	8	476	63	629	96	788	166	47	13	226	5	37	29	71	1561
19/02/20 11:00-12:00	90	590	9	689	66	700	106	872	214	47	13	274	4	35	38	77	1912
19/02/20 12:00-13:00	83	672	12	767	68	789	113	970	248	54	14	316	4	35	42	81	2134
19/02/20 13:00-14:00	95	615	5	715	78	722	84	884	235	62	17	314	5	42	60	107	2020
19/02/20 14:00-15:00	84	625	8	717	46	747	83	876	204	54	15	273	5	42	33	80	1946
19/02/20 15:00-16:00	58	584	7	649	43	753	81	877	235	65	18	318	3	26	33	62	1906
19/02/20 16:00-17:00	47	624	7	678	47	759	85	891	177	35	9	221	5	40	34	79	1869
19/02/20 17:00-18:00	54	646	6	706	43	739	81	863	163	43	11	217	5	37	44	86	1872
19/02/20 18:00-19:00	35	565	6	606	34	644	54	732	171	31	8	210	4	35	30	69	1617
19/02/20 19:00-20:00	23	392	4	419	18	441	41	500	117	19	5	141	3	22	27	52	1112
19/02/20 20:00-21:00	16	282	4	302	17	253	27	297	72	10	3	85	2	17	12	31	715
19/02/20 21:00-22:00	11	225	0	236	12	143	11	166	39	8	2	49	2	16	15	33	484
19/02/20 22:00-23:00	1	65	0	66	1	73	1	75	14	5	1	20	1	5	2	8	169
19/02/20 23:00-00:00	0	24	0	24	2	23	1	26	5	2	0	7	0	2	2	4	61
20/02/20 00:00-01:00	0	19	1	20	1	21	0	22	0	0	0	0	0	2	2	4	46
20/02/20 01:00-	0	11	0	11	0	17	0	17	0	1	0	1	0	1	0	1	30

Attachment 1

Turning Movement Volume Report

Report Date: 12/18/2020 7:52:13 AM

From 2/18/2020 to 2/20/2020

Fairway & Home Depot
(332)

Intersection: 111

Time	NW				SE				NE				SW				Int Total
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	
02:00																	
20/02/20 02:00-03:00	0	7	0	7	1	8	0	9	0	0	0	0	0	1	1	2	18
20/02/20 03:00-04:00	1	6	0	7	0	14	0	14	1	0	0	1	0	0	0	0	22
20/02/20 04:00-05:00	1	14	0	15	1	19	2	22	2	1	0	3	0	1	1	2	42
20/02/20 05:00-06:00	5	27	0	32	2	32	6	40	3	1	0	4	0	0	0	0	76
20/02/20 06:00-07:00	5	56	2	63	8	98	18	124	19	3	1	23	0	4	4	8	218
20/02/20 07:00-08:00	17	154	3	174	16	228	38	282	30	5	1	36	1	9	8	18	510
20/02/20 08:00-09:00	33	201	8	242	37	374	65	476	64	23	6	93	1	10	8	19	830
20/02/20 09:00-10:00	54	273	3	330	52	521	66	639	101	20	5	126	3	27	28	58	1153
20/02/20 10:00-11:00	68	443	11	522	62	570	82	714	151	46	12	209	3	27	27	57	1502
20/02/20 11:00-12:00	73	577	13	663	52	701	107	860	200	43	12	255	5	44	37	86	1864
20/02/20 12:00-13:00	80	641	13	734	90	815	111	1016	227	56	15	298	7	54	52	113	2161
20/02/20 13:00-14:00	71	697	8	776	83	814	91	988	224	54	15	293	7	56	51	114	2171
20/02/20 14:00-15:00	83	645	7	735	58	709	99	866	219	57	15	291	5	37	33	75	1967
20/02/20 15:00-16:00	60	600	2	662	55	742	70	867	203	47	13	263	4	31	29	64	1856
20/02/20 16:00-17:00	49	623	7	679	60	757	91	908	178	43	11	232	3	26	39	68	1887
20/02/20 17:00-18:00	44	727	5	776	48	711	66	825	179	35	9	223	4	32	33	69	1893

Attachment 1

Turning Movement Volume Report

Report Date: 12/18/2020 7:52:13 AM
 From 2/18/2020 to 2/20/2020

Fairway & Home Depot
 (332)

Intersection: 111

Time	NW				SE				NE				SW				Int Total
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	
20/02/20 18:00-19:00	44	546	3	593	39	642	41	722	157	25	7	189	5	38	33	76	1580
20/02/20 19:00-20:00	24	408	7	439	24	397	49	470	107	18	5	130	3	22	22	47	1086
20/02/20 20:00-21:00	21	298	2	321	15	277	29	321	64	17	5	86	2	14	17	33	761
20/02/20 21:00-22:00	8	186	0	194	10	155	13	178	37	6	2	45	1	12	11	24	441
20/02/20 22:00-23:00	4	62	2	68	2	69	4	75	21	4	1	26	0	2	3	5	174
20/02/20 23:00-00:00	1	28	0	29	4	38	0	42	5	1	0	6	0	3	4	7	84
Summary	2293	21413	269	23975	1991	26110	3156	31257	6685	1556	414	8655	160	1333	1344	2837	66724

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	From Sunset Blvd Dwy to Drive Thru Exit	From Springview Dr Dwy to Drive Thru Exit
6:00:00	0	0
6:05:00	0	1
6:10:00	2	2
6:15:00	2	2
6:20:00	1	2
6:25:00	4	3
6:30:00	4	3
6:35:00	2	3
6:40:00	4	4
6:45:00	4	4
6:50:00	2	3
6:55:00	2	2
7:00:00	3	5
7:05:00	3	5
7:10:00	1	1
7:15:00	2	2
7:20:00	3	2
7:25:00	5	6
7:30:00	4	5
7:35:00	4	5
7:40:00	3	4
7:45:00	2	3
7:50:00	2	6
7:55:00	4	7
8:00:00	4	7
8:05:00	5	4
8:10:00	5	6
8:15:00	5	6
8:20:00	5	5
8:25:00	4	6
8:30:00	4	4
8:35:00	2	4
8:40:00	5	3
8:45:00	3	2
8:50:00	4	1

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	From Sunset Blvd Dwy to Drive Thru Exit	From Springview Dr Dwy to Drive Thru Exit
8:55:00	3	3
9:00:00	2	3
9:05:00	3	3
9:10:00	5	4
9:15:00	6	5
9:20:00	9	4
9:25:00	9	7
9:30:00	9	7
9:35:00	8	6
9:40:00	8	6
9:45:00	8	9
9:50:00	8	7
9:55:00	5	3
10:00:00	4	3
10:05:00	4	5
10:10:00	4	5
10:15:00	7	3
10:20:00	8	3
10:25:00	4	4
10:30:00	5	5
10:35:00	6	6
10:40:00	6	5
10:45:00	1	2
10:50:00	2	1
10:55:00	3	1
11:00:00	2	3
11:05:00	3	3
11:10:00	4	5
11:15:00	4	6
11:20:00	3	6
11:25:00	4	7
11:30:00	4	5
11:35:00	4	6
11:40:00	5	6
11:45:00	5	8

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	From Sunset Blvd Dwy to Drive Thru Exit	From Springview Dr Dwy to Drive Thru Exit
11:50:00	4	8
11:55:00	5	6
12:00:00	6	7
12:05:00	6	6
12:10:00	3	6
12:15:00	3	6
12:20:00	2	4
12:25:00	6	3
12:30:00	6	5
12:35:00	6	5
12:40:00	3	5
12:45:00	5	6
12:50:00	5	6
12:55:00	4	5
13:00:00	3	2
13:05:00	3	2
13:10:00	4	4
13:15:00	4	4
13:20:00	8	5
13:25:00	8	5
13:30:00	5	5
13:35:00	3	4
13:40:00	7	5
13:45:00	6	7
13:50:00	7	8
13:55:00	5	3
14:00:00	6	6
14:05:00	5	4
14:10:00	3	4
14:15:00	3	6
14:20:00	3	6
14:25:00	3	4
14:30:00	5	5
14:35:00	7	6
14:40:00	4	6

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	From Sunset Blvd Dwy to Drive Thru Exit	From Springview Dr Dwy to Drive Thru Exit
14:45:00	3	3
14:50:00	3	1
14:55:00	3	2
15:00:00	3	3
15:05:00	5	3
15:10:00	5	5
15:15:00	5	6
15:20:00	5	5
15:25:00	5	5
15:30:00	4	5
15:35:00	4	5
15:40:00	5	2
15:45:00	3	3
15:50:00	5	3
15:55:00	7	3
16:00:00	6	4
16:05:00	5	4
16:10:00	4	4
16:15:00	3	2
16:20:00	4	2
16:25:00	4	4
16:30:00	6	4
16:35:00	6	4
16:40:00	4	4
16:45:00	3	3
16:50:00	3	3
16:55:00	2	2
17:00:00	2	3
17:05:00	3	1
17:10:00	6	2
17:15:00	4	2
17:20:00	2	4
17:25:00	6	5
17:30:00	8	4
17:35:00	7	5

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	From Sunset Blvd Dwy to Drive Thru Exit	From Springview Dr Dwy to Drive Thru Exit
17:40:00	8	7
17:45:00	8	6
17:50:00	7	5
17:55:00	6	3
18:00:00	6	4
18:05:00	5	3
18:10:00	5	4
18:15:00	5	5
18:20:00	4	7
18:25:00	2	6
18:30:00	4	7
18:35:00	4	3
18:40:00	3	0
18:45:00	3	2
18:50:00	2	3
18:55:00	5	4
19:00:00	4	5
19:05:00	4	7
19:10:00	6	8
19:15:00	8	9
19:20:00	7	7
19:25:00	7	5
19:30:00	7	8
19:35:00	7	8
19:40:00	6	6
19:45:00	5	4
19:50:00	6	6
19:55:00	4	7
20:00:00	4	5
20:05:00	8	4
20:10:00	8	3
20:15:00	6	3
20:20:00	10	3
20:25:00	9	5
20:30:00	7	6

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	From Sunset Blvd Dwy to Drive Thru Exit	From Springview Dr Dwy to Drive Thru Exit
20:35:00	7	8
20:40:00	6	8
20:45:00	7	3
20:50:00	7	3
20:55:00	8	3
21:00:00	10	2

Attachment 1

Prepared by National Data & Surveying Services
Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	East Facing Drive Thru Pickup Window		West Facing Drive Thru Pickup Window	
	In	Out	In	Out
6:00:00	0	0	0	0
6:05:00	0	0	1	0
6:10:00	2	1	2	1
6:15:00	0	1	2	2
6:20:00	0	0	1	0
6:25:00	2	1	4	2
6:30:00	0	2	1	2
6:35:00	1	2	4	2
6:40:00	4	1	1	2
6:45:00	0	2	3	2
6:50:00	0	2	3	4
6:55:00	1	1	2	1
7:00:00	2	2	6	1
7:05:00	0	2	0	4
7:10:00	0	2	3	1
7:15:00	2	2	2	1
7:20:00	4	1	3	2
7:25:00	2	2	6	4
7:30:00	4	4	3	2
7:35:00	1	3	3	5
7:40:00	3	3	2	4
7:45:00	3	3	2	2
7:50:00	1	2	6	2
7:55:00	5	2	4	1
8:00:00	1	7	2	6
8:05:00	5	2	2	4
8:10:00	5	0	3	0
8:15:00	2	4	3	3
8:20:00	3	4	5	2
8:25:00	3	4	2	4
8:30:00	1	2	4	2
8:35:00	2	2	4	4
8:40:00	3	4	2	3
8:45:00	2	2	1	2
8:50:00	2	3	1	1
8:55:00	2	3	4	0
9:00:00	2	1	0	2
9:05:00	2	2	3	1

Attachment 1

Prepared by National Data & Surveying Services
Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	East Facing Drive Thru Pickup Window		West Facing Drive Thru Pickup Window	
9:10:00	4	4	3	2
9:15:00	5	2	3	3
9:20:00	4	2	1	1
9:25:00	2	1	6	3
9:30:00	1	2	4	5
9:35:00	3	2	4	3
9:40:00	2	5	4	1
9:45:00	3	0	2	3
9:50:00	2	8	2	6
9:55:00	5	2	2	4
10:00:00	3	4	2	0
10:05:00	1	2	2	1
10:10:00	2	2	2	3
10:15:00	5	1	3	2
10:20:00	2	5	4	3
10:25:00	1	3	2	1
10:30:00	4	2	4	1
10:35:00	3	1	4	6
10:40:00	2	5	2	3
10:45:00	1	2	0	2
10:50:00	1	1	2	0
10:55:00	2	2	0	1
11:00:00	1	2	3	0
11:05:00	2	2	3	2
11:10:00	2	1	4	2
11:15:00	2	3	3	1
11:20:00	0	2	2	2
11:25:00	3	3	5	5
11:30:00	1	3	5	3
11:35:00	5	4	4	2
11:40:00	2	1	5	2
11:45:00	2	3	4	3
11:50:00	1	2	2	4
11:55:00	3	2	2	0
12:00:00	3	1	2	2
12:05:00	2	6	3	4
12:10:00	1	3	5	4
12:15:00	1	2	3	3
12:20:00	2	2	0	2

Attachment 1

Prepared by National Data & Surveying Services
Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	East Facing Drive Thru Pickup Window		West Facing Drive Thru Pickup Window	
12:25:00	5	2	4	2
12:30:00	2	5	5	4
12:35:00	4	3	2	0
12:40:00	1	3	4	4
12:45:00	4	3	6	2
12:50:00	0	2	1	3
12:55:00	3	4	4	5
13:00:00	1	2	2	3
13:05:00	2	1	3	2
13:10:00	2	3	3	1
13:15:00	3	3	3	3
13:20:00	9	2	3	3
13:25:00	2	5	4	3
13:30:00	0	2	4	2
13:35:00	1	3	3	3
13:40:00	6	3	6	2
13:45:00	1	2	4	0
13:50:00	4	4	1	6
13:55:00	2	3	4	3
14:00:00	5	4	7	4
14:05:00	0	3	3	3
14:10:00	3	2	3	3
14:15:00	3	4	4	0
14:20:00	1	4	1	6
14:25:00	4	1	4	1
14:30:00	3	3	4	3
14:35:00	5	4	6	4
14:40:00	4	2	1	6
14:45:00	1	2	4	2
14:50:00	3	3	1	1
14:55:00	1	2	4	3
15:00:00	2	3	4	2
15:05:00	2	2	5	3
15:10:00	3	4	6	4
15:15:00	1	0	6	5
15:20:00	2	3	3	4
15:25:00	3	2	3	2
15:30:00	2	2	4	5
15:35:00	3	3	2	4

Attachment 1

Prepared by National Data & Surveying Services
Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	East Facing Drive Thru Pickup Window		West Facing Drive Thru Pickup Window	
	1	2	1	2
15:40:00	1	2	1	2
15:45:00	1	3	4	3
15:50:00	7	2	3	2
15:55:00	4	3	3	3
16:00:00	1	2	3	2
16:05:00	2	4	2	1
16:10:00	1	1	3	6
16:15:00	1	2	2	2
16:20:00	4	2	1	2
16:25:00	4	4	5	1
16:30:00	4	3	1	4
16:35:00	0	1	4	1
16:40:00	0	3	1	3
16:45:00	3	3	3	2
16:50:00	1	1	1	1
16:55:00	1	1	2	3
17:00:00	1	1	4	3
17:05:00	3	2	1	1
17:10:00	2	1	2	1
17:15:00	1	5	3	2
17:20:00	0	1	6	3
17:25:00	5	1	4	3
17:30:00	3	1	2	3
17:35:00	1	3	3	1
17:40:00	4	2	3	4
17:45:00	3	3	4	5
17:50:00	0	3	2	2
17:55:00	4	2	2	4
18:00:00	2	3	4	1
18:05:00	0	2	1	4
18:10:00	6	2	4	4
18:15:00	2	3	4	2
18:20:00	1	4	3	3
18:25:00	2	2	6	4
18:30:00	2	2	4	5
18:35:00	1	2	1	4
18:40:00	1	3	0	0
18:45:00	2	2	3	1
18:50:00	2	3	4	2

Attachment 1

Prepared by National Data & Surveying Services
Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunset Blvd/Springview Dr

City: Rocklin

Day: Wed

Date: 12/2/2020

Interval	East Facing Drive Thru Pickup Window		West Facing Drive Thru Pickup Window	
18:55:00	4	2	4	2
19:00:00	1	2	4	3
19:05:00	3	3	3	0
19:10:00	6	3	3	1
19:15:00	4	4	2	4
19:20:00	2	2	2	5
19:25:00	4	3	3	5
19:30:00	2	3	9	2
19:35:00	3	3	3	3
19:40:00	0	4	1	3
19:45:00	3	2	2	2
19:50:00	2	2	7	3
19:55:00	2	2	2	4
20:00:00	1	3	3	2
20:05:00	6	1	3	5
20:10:00	0	3	3	2
20:15:00	3	2	0	2
20:20:00	7	4	5	1
20:25:00	3	4	4	2
20:30:00	0	2	0	3
20:35:00	2	2	6	1
20:40:00	2	3	2	6
20:45:00	4	2	1	3
20:50:00	2	1	2	1
20:55:00	2	3	1	2
21:00:00	7	4	1	3
Totals	424	448	539	462

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	From Pickup Window to Back in Line
6:00:00	2
6:05:00	1
6:10:00	1
6:15:00	2
6:20:00	5
6:25:00	4
6:30:00	2
6:35:00	4
6:40:00	5
6:45:00	4
6:50:00	5
6:55:00	7
7:00:00	5
7:05:00	4
7:10:00	4
7:15:00	3
7:20:00	4
7:25:00	4
7:30:00	6
7:35:00	7
7:40:00	8
7:45:00	6
7:50:00	4
7:55:00	4
8:00:00	6
8:05:00	7
8:10:00	9
8:15:00	9
8:20:00	11
8:25:00	9
8:30:00	14
8:35:00	13
8:40:00	12
8:45:00	12
8:50:00	9

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	From Pickup Window to Back in Line
8:55:00	8
9:00:00	8
9:05:00	9
9:10:00	9
9:15:00	8
9:20:00	8
9:25:00	8
9:30:00	9
9:35:00	5
9:40:00	4
9:45:00	8
9:50:00	9
9:55:00	8
10:00:00	7
10:05:00	8
10:10:00	9
10:15:00	10
10:20:00	9
10:25:00	6
10:30:00	6
10:35:00	8
10:40:00	8
10:45:00	12
10:50:00	14
10:55:00	14
11:00:00	12
11:05:00	8
11:10:00	7
11:15:00	5
11:20:00	7
11:25:00	7
11:30:00	6
11:35:00	11
11:40:00	9
11:45:00	9

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	From Pickup Window to Back in Line
11:50:00	4
11:55:00	9
12:00:00	7
12:05:00	6
12:10:00	9
12:15:00	9
12:20:00	8
12:25:00	8
12:30:00	9
12:35:00	10
12:40:00	10
12:45:00	13
12:50:00	11
12:55:00	8
13:00:00	12
13:05:00	14
13:10:00	14
13:15:00	15
13:20:00	15
13:25:00	13
13:30:00	15
13:35:00	14
13:40:00	16
13:45:00	16
13:50:00	14
13:55:00	15
14:00:00	14
14:05:00	17
14:10:00	16
14:15:00	16
14:20:00	15
14:25:00	17
14:30:00	14
14:35:00	13
14:40:00	12

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	From Pickup Window to Back in Line
14:45:00	11
14:50:00	8
14:55:00	8
15:00:00	7
15:05:00	6
15:10:00	7
15:15:00	6
15:20:00	5
15:25:00	4
15:30:00	6
15:35:00	7
15:40:00	9
15:45:00	8
15:50:00	9
15:55:00	5
16:00:00	8
16:05:00	11
16:10:00	12
16:15:00	12
16:20:00	9
16:25:00	5
16:30:00	3
16:35:00	7
16:40:00	7
16:45:00	8
16:50:00	7
16:55:00	7
17:00:00	8
17:05:00	7
17:10:00	8
17:15:00	7
17:20:00	7
17:25:00	2
17:30:00	3
17:35:00	6

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	From Pickup Window to Back in Line
17:40:00	5
17:45:00	3
17:50:00	5
17:55:00	5
18:00:00	3
18:05:00	4
18:10:00	3
18:15:00	4
18:20:00	6
18:25:00	6
18:30:00	8
18:35:00	10
18:40:00	10
18:45:00	10
18:50:00	4
18:55:00	8
19:00:00	7
19:05:00	10
19:10:00	14
19:15:00	6
19:20:00	7
19:25:00	8
19:30:00	9
19:35:00	8
19:40:00	9
19:45:00	8
19:50:00	9
19:55:00	9
20:00:00	12
20:05:00	11
20:10:00	12
20:15:00	17
20:20:00	18
20:25:00	19
20:30:00	19

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	From Pickup Window to Back in Line
20:35:00	18
20:40:00	17
20:45:00	17
20:50:00	16
20:55:00	17
21:00:00	18

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	Drive Thru	
	In	Out
6:00:00	3	4
6:05:00	2	2
6:10:00	0	0
6:15:00	4	2
6:20:00	2	2
6:25:00	2	4
6:30:00	2	2
6:35:00	4	2
6:40:00	2	4
6:45:00	4	2
6:50:00	6	5
6:55:00	3	3
7:00:00	4	7
7:05:00	3	3
7:10:00	5	5
7:15:00	3	3
7:20:00	2	2
7:25:00	5	4
7:30:00	3	4
7:35:00	4	1
7:40:00	5	5
7:45:00	3	6
7:50:00	4	4
7:55:00	4	2
8:00:00	6	4
8:05:00	6	6
8:10:00	5	2
8:15:00	6	6
8:20:00	4	6
8:25:00	6	5
8:30:00	5	6
8:35:00	7	4
8:40:00	4	4
8:45:00	4	6

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	Drive Thru	
8:50:00	5	5
8:55:00	5	5
9:00:00	3	6
9:05:00	6	4
9:10:00	4	6
9:15:00	7	6
9:20:00	4	2
9:25:00	6	5
9:30:00	1	7
9:35:00	4	5
9:40:00	7	3
9:45:00	5	2
9:50:00	2	2
9:55:00	2	6
10:00:00	5	3
10:05:00	6	4
10:10:00	4	3
10:15:00	3	5
10:20:00	4	6
10:25:00	2	3
10:30:00	7	4
10:35:00	2	3
10:40:00	5	1
10:45:00	3	2
10:50:00	3	4
10:55:00	5	5
11:00:00	8	9
11:05:00	2	4
11:10:00	3	3
11:15:00	5	5
11:20:00	4	2
11:25:00	0	6
11:30:00	8	2
11:35:00	3	3
11:40:00	5	3
11:45:00	2	9

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	Drive Thru	
11:50:00	3	1
11:55:00	6	3
12:00:00	3	5
12:05:00	7	6
12:10:00	3	2
12:15:00	5	4
12:20:00	3	4
12:25:00	3	1
12:30:00	3	4
12:35:00	5	6
12:40:00	5	3
12:45:00	3	4
12:50:00	5	6
12:55:00	4	4
13:00:00	5	2
13:05:00	2	4
13:10:00	5	7
13:15:00	8	4
13:20:00	3	7
13:25:00	8	5
13:30:00	5	6
13:35:00	5	4
13:40:00	4	4
13:45:00	4	5
13:50:00	5	4
13:55:00	5	6
14:00:00	2	2
14:05:00	7	5
14:10:00	0	2
14:15:00	10	8
14:20:00	2	3
14:25:00	5	7
14:30:00	6	3
14:35:00	2	3
14:40:00	6	7
14:45:00	4	5

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	Drive Thru	
14:50:00	2	1
14:55:00	4	5
15:00:00	1	4
15:05:00	4	5
15:10:00	5	3
15:15:00	5	5
15:20:00	3	4
15:25:00	5	5
15:30:00	5	3
15:35:00	8	6
15:40:00	2	4
15:45:00	6	4
15:50:00	1	4
15:55:00	5	6
16:00:00	5	1
16:05:00	2	5
16:10:00	6	2
16:15:00	5	6
16:20:00	4	7
16:25:00	3	5
16:30:00	2	2
16:35:00	6	2
16:40:00	3	5
16:45:00	4	4
16:50:00	4	4
16:55:00	5	3
17:00:00	5	6
17:05:00	4	3
17:10:00	3	4
17:15:00	2	2
17:20:00	0	6
17:25:00	2	1
17:30:00	3	2
17:35:00	7	4
17:40:00	2	5
17:45:00	2	2

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	Drive Thru	
17:50:00	3	0
17:55:00	2	4
18:00:00	3	4
18:05:00	4	3
18:10:00	2	2
18:15:00	2	1
18:20:00	2	1
18:25:00	6	4
18:30:00	4	3
18:35:00	7	4
18:40:00	3	4
18:45:00	5	10
18:50:00	2	4
18:55:00	8	2
19:00:00	0	2
19:05:00	7	3
19:10:00	2	8
19:15:00	6	3
19:20:00	4	3
19:25:00	4	7
19:30:00	4	1
19:35:00	1	4
19:40:00	6	5
19:45:00	4	2
19:50:00	3	4
19:55:00	6	2
20:00:00	5	5
20:05:00	2	2
20:10:00	4	4
20:15:00	1	1
20:20:00	4	4
20:25:00	1	2
20:30:00	4	2
20:35:00	2	3
20:40:00	5	5
20:45:00	4	6

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Baseline Rd

City: Roseville

Day: Wed

Date: 12/2/2020

Interval	Drive Thru	
20:50:00	4	1
20:55:00	2	3
21:00:00	7	9
Totals	723	713

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Sunrise Ave

City: Roseville

Day: Wed

Date: 02/12/2020

Interval	Vehicles Till merging Point	From Merging point to End of Left Lane	Total Vehicle in Queue From Left Lane to Drive Thru Exit	From Merging point to End of Right Lane	Total Vehicle in Queue From Right Lane to Drive Thru Exit
6:00:00	4	0	4	0	4
6:05:00	3	0	3	0	3
6:10:00	4	0	4	0	4
6:15:00	5	0	5	0	5
6:20:00	5	2	7	0	5
6:25:00	6	2	8	1	7
6:30:00	4	0	4	0	4
6:35:00	5	1	6	0	5
6:40:00	5	2	7	1	6
6:45:00	5	2	7	2	7
6:50:00	5	1	6	2	7
6:55:00	6	1	7	1	7
7:00:00	6	1	7	2	8
7:05:00	5	2	7	2	7
7:10:00	5	2	7	0	5
7:15:00	5	3	8	0	5
7:20:00	5	1	6	1	6
7:25:00	5	4	9	0	5
7:30:00	5	4	9	3	8
7:35:00	5	2	7	3	8
7:40:00	6	2	8	1	7
7:45:00	5	2	7	0	5
7:50:00	5	2	7	2	7
7:55:00	3	1	4	0	3
8:00:00	3	0	3	0	3
8:05:00	5	0	5	0	5
8:10:00	6	1	7	1	7
8:15:00	5	2	7	2	7
8:20:00	5	2	7	1	6
8:25:00	6	2	8	1	7
8:30:00	6	2	8	2	8
8:35:00	5	1	6	0	5
8:40:00	5	1	6	1	6
8:45:00	5	1	6	4	9
8:50:00	5	4	9	4	9
8:55:00	5	5	10	3	8
9:00:00	6	2	8	2	8
9:05:00	5	2	7	0	5
9:10:00	5	2	7	0	5
9:15:00	5	1	6	0	5
9:20:00	4	1	5	1	5
9:25:00	5	0	5	0	5
9:30:00	3	0	3	0	3
9:35:00	5	1	6	1	6
9:40:00	5	3	8	1	6
9:45:00	5	4	9	4	9
9:50:00	5	4	9	5	10
9:55:00	6	7	13	6	12
10:00:00	5	4	9	4	9
10:05:00	6	3	9	2	8
10:10:00	6	2	8	0	6
10:15:00	5	1	6	0	5
10:20:00	4	2	6	3	7
10:25:00	5	2	7	3	8
10:30:00	5	3	8	2	7
10:35:00	5	3	8	0	5
10:40:00	4	0	4	0	4
10:45:00	5	0	5	1	6
10:50:00	5	4	9	4	9
10:55:00	6	5	11	4	10
11:00:00	6	4	10	3	9
11:05:00	6	3	9	3	9
11:10:00	6	2	8	1	7
11:15:00	4	1	5	0	4
11:20:00	6	1	7	2	8
11:25:00	5	2	7	3	8
11:30:00	5	1	6	1	6
11:35:00	5	0	5	1	6
11:40:00	5	3	8	0	5
11:45:00	5	3	8	3	8
11:50:00	5	5	10	4	9
11:55:00	5	4	9	4	9
12:00:00	6	3	9	3	9
12:05:00	6	2	8	4	10
12:10:00	5	2	7	2	7
12:15:00	5	0	5	2	7
12:20:00	4	2	6	1	5
12:25:00	5	1	6	1	6
12:30:00	5	0	5	2	7
12:35:00	5	0	5	0	5
12:40:00	5	0	5	0	5
12:45:00	4	0	4	1	5
12:50:00	5	0	5	0	5

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Sunrise Ave

City: Roseville

Day: Wed

Date: 02/12/2020

Interval	Vehicles Till merging Point	From Merging point to End of Left Lane	Total Vehicle in Queue From Left Lane to Drive Thru Exit	From Merging point to End of Right Lane	Total Vehicle in Queue From Right Lane to Drive Thru Exit
12:55:00	5	1	6	1	6
13:00:00	6	0	6	3	9
13:05:00	6	3	9	3	9
13:10:00	6	5	11	4	10
13:15:00	6	3	9	3	9
13:20:00	6	4	10	2	8
13:25:00	6	1	7	3	9
13:30:00	6	2	8	3	9
13:35:00	6	1	7	1	7
13:40:00	6	1	7	2	8
13:45:00	5	0	5	0	5
13:50:00	3	0	3	0	3
13:55:00	6	1	7	1	7
14:00:00	6	1	7	1	7
14:05:00	6	1	7	0	6
14:10:00	6	0	6	3	9
14:15:00	6	2	8	0	6
14:20:00	6	2	8	0	6
14:25:00	4	0	4	0	4
14:30:00	6	1	7	0	6
14:35:00	4	0	4	0	4
14:40:00	6	1	7	0	6
14:45:00	6	1	7	2	8
14:50:00	6	2	8	3	9
14:55:00	6	0	6	1	7
15:00:00	4	1	5	2	6
15:05:00	5	1	6	3	8
15:10:00	5	1	6	2	7
15:15:00	6	1	7	1	7
15:20:00	6	2	8	3	9
15:25:00	6	2	8	3	9
15:30:00	6	2	8	3	9
15:35:00	5	0	5	2	7
15:40:00	5	0	5	1	6
15:45:00	5	0	5	1	6
15:50:00	6	0	6	0	6
15:55:00	5	0	5	2	7
16:00:00	6	0	6	0	6
16:05:00	4	0	4	0	4
16:10:00	5	0	5	0	5
16:15:00	4	0	4	0	4
16:20:00	4	0	4	0	4
16:25:00	2	1	3	0	2
16:30:00	6	2	8	1	7
16:35:00	6	2	8	2	8
16:40:00	4	2	6	0	4
16:45:00	4	2	6	1	5
16:50:00	5	0	5	1	6
16:55:00	2	0	2	0	2
17:00:00	1	0	1	0	1
17:05:00	3	0	3	0	3
17:10:00	1	0	1	0	1
17:15:00	1	0	1	0	1
17:20:00	2	0	2	0	2
17:25:00	5	0	5	0	5
17:30:00	5	0	5	2	7
17:35:00	5	0	5	2	7
17:40:00	5	0	5	0	5
17:45:00	4	0	4	0	4
17:50:00	4	0	4	0	4
17:55:00	5	0	5	0	5
18:00:00	3	0	3	0	3
18:05:00	2	0	2	0	2
18:10:00	1	0	1	0	1
18:15:00	1	0	1	0	1
18:20:00	2	0	2	0	2
18:25:00	5	2	7	0	5
18:30:00	5	1	6	0	5
18:35:00	3	0	3	0	3
18:40:00	1	0	1	0	1
18:45:00	3	0	3	0	3
18:50:00	3	0	3	0	3
18:55:00	2	0	2	0	2
19:00:00	4	0	4	0	4
19:05:00	3	0	3	0	3
19:10:00	3	0	3	0	3
19:15:00	3	0	3	0	3
19:20:00	4	0	4	0	4
19:25:00	4	1	5	2	6
19:30:00	5	2	7	1	6
19:35:00	5	2	7	0	5
19:40:00	6	0	6	0	6
19:45:00	5	0	5	0	5

Attachment 1

Prepared by National Data & Surveying Services

Max Queue Study

Location: Dutch Bros Drive Thru at Sunrise Ave
 City: Roseville
 Day: Wed
 Date: 02/12/2020

Interval	Vehicles Till merging Point	From Merging point to End of Left Lane	Total Vehicle in Queue From Left Lane to Drive Thru Exit	From Merging point to End of Right Lane	Total Vehicle in Queue From Right Lane to Drive Thru Exit
19:50:00	5	0	5	0	5
19:55:00	5	0	5	0	5
20:00:00	5	0	5	0	5
20:05:00	6	2	8	2	8
20:10:00	6	3	9	3	9
20:15:00	6	3	9	3	9
20:20:00	6	3	9	0	6
20:25:00	6	1	7	0	6
20:30:00	6	2	8	1	7
20:35:00	5	2	7	1	6
20:40:00	6	4	10	1	7
20:45:00	6	1	7	5	11
20:50:00	6	1	7	6	12
20:55:00	6	2	8	5	11
21:00:00	6	2	8	4	10

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunrise Ave

City: Roseville

Day: Wed

Date: 02/12/2020

Interval	Drive Thru	
	In	Out
6:00:00	4	2
6:05:00	0	1
6:10:00	4	3
6:15:00	3	3
6:20:00	4	1
6:25:00	2	5
6:30:00	2	2
6:35:00	4	2
6:40:00	3	1
6:45:00	2	1
6:50:00	0	1
6:55:00	3	4
7:00:00	4	5
7:05:00	4	2
7:10:00	2	4
7:15:00	4	5
7:20:00	5	2
7:25:00	5	3
7:30:00	4	4
7:35:00	6	8
7:40:00	2	2
7:45:00	2	5
7:50:00	5	5
7:55:00	0	3
8:00:00	3	1
8:05:00	4	2
8:10:00	6	3
8:15:00	3	4
8:20:00	2	3
8:25:00	4	3
8:30:00	4	5
8:35:00	1	3
8:40:00	6	3
8:45:00	6	4

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunrise Ave

City: Roseville

Day: Wed

Date: 02/12/2020

Interval	Drive Thru	
8:50:00	5	3
8:55:00	2	5
9:00:00	3	5
9:05:00	5	4
9:10:00	1	4
9:15:00	4	5
9:20:00	3	2
9:25:00	3	3
9:30:00	2	4
9:35:00	6	1
9:40:00	3	3
9:45:00	6	1
9:50:00	4	5
9:55:00	8	5
10:00:00	0	6
10:05:00	4	5
10:10:00	2	4
10:15:00	3	4
10:20:00	8	3
10:25:00	3	4
10:30:00	2	2
10:35:00	1	6
10:40:00	3	3
10:45:00	4	2
10:50:00	8	2
10:55:00	5	1
11:00:00	0	4
11:05:00	1	3
11:10:00	0	6
11:15:00	4	2
11:20:00	4	3
11:25:00	6	6
11:30:00	4	3
11:35:00	3	5
11:40:00	7	4
11:45:00	5	3

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunrise Ave

City: Roseville

Day: Wed

Date: 02/12/2020

Interval	Drive Thru	
11:50:00	5	2
11:55:00	3	6
12:00:00	3	3
12:05:00	3	8
12:10:00	5	4
12:15:00	3	4
12:20:00	3	3
12:25:00	4	4
12:30:00	2	3
12:35:00	3	2
12:40:00	1	4
12:45:00	4	2
12:50:00	4	4
12:55:00	3	2
13:00:00	4	5
13:05:00	9	2
13:10:00	3	2
13:15:00	2	5
13:20:00	6	6
13:25:00	3	2
13:30:00	1	4
13:35:00	3	1
13:40:00	2	6
13:45:00	2	5
13:50:00	4	2
13:55:00	6	2
14:00:00	2	4
14:05:00	4	4
14:10:00	5	4
14:15:00	5	3
14:20:00	0	6
14:25:00	3	1
14:30:00	4	3
14:35:00	2	3
14:40:00	7	4
14:45:00	7	5

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunrise Ave

City: Roseville

Day: Wed

Date: 02/12/2020

Interval	Drive Thru	
14:50:00	3	4
14:55:00	5	6
15:00:00	4	3
15:05:00	6	6
15:10:00	5	8
15:15:00	4	1
15:20:00	4	3
15:25:00	6	5
15:30:00	4	7
15:35:00	0	4
15:40:00	6	3
15:45:00	1	2
15:50:00	3	2
15:55:00	5	4
16:00:00	0	3
16:05:00	4	4
16:10:00	3	2
16:15:00	3	4
16:20:00	3	4
16:25:00	2	3
16:30:00	7	0
16:35:00	2	6
16:40:00	5	5
16:45:00	3	4
16:50:00	2	4
16:55:00	1	2
17:00:00	1	1
17:05:00	2	2
17:10:00	1	1
17:15:00	1	1
17:20:00	2	2
17:25:00	5	1
17:30:00	5	4
17:35:00	2	4
17:40:00	4	4
17:45:00	3	3

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunrise Ave

City: Roseville

Day: Wed

Date: 02/12/2020

Interval	Drive Thru	
17:50:00	4	3
17:55:00	2	5
18:00:00	2	2
18:05:00	0	2
18:10:00	1	0
18:15:00	1	1
18:20:00	2	1
18:25:00	6	2
18:30:00	2	5
18:35:00	1	3
18:40:00	2	1
18:45:00	2	2
18:50:00	1	2
18:55:00	3	1
19:00:00	1	3
19:05:00	3	2
19:10:00	1	1
19:15:00	2	1
19:20:00	4	3
19:25:00	4	3
19:30:00	3	2
19:35:00	0	1
19:40:00	2	2
19:45:00	2	2
19:50:00	2	2
19:55:00	0	1
20:00:00	4	3
20:05:00	6	2
20:10:00	3	3
20:15:00	1	3
20:20:00	2	3
20:25:00	2	1
20:30:00	6	2
20:35:00	1	4
20:40:00	5	5
20:45:00	5	1

Attachment 1

Prepared by National Data & Surveying Services

Drive Thru Volume Study

Location: Dutch Bros Drive Thru at Sunrise Ave

City: Roseville

Day: Wed

Date: 02/12/2020

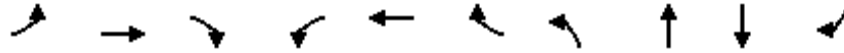
Interval	Drive Thru	
20:50:00	4	5
20:55:00	3	2
21:00:00	0	2
Totals	587	577

Attachment B
Analysis Worksheets

Attachment 1

Roseville Fairway Dr Coffee Kiosk
 2: Home Depot East Dwy/Home Depot & Fairway Dr

Existing plus Project Conditions
 AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	40	441	90	85	218	9	84	81	12	9
v/c Ratio	0.31	0.19	0.08	0.50	0.09	0.01	0.44	0.40	0.11	0.03
Control Delay	40.9	16.9	9.5	37.6	5.0	0.0	43.5	34.3	42.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	16.9	9.5	37.6	5.0	0.0	43.5	34.3	42.0	0.2
Queue Length 50th (ft)	23	45	0	49	21	0	47	35	7	0
Queue Length 95th (ft)	55	172	49	m70	45	m0	91	77	24	0
Internal Link Dist (ft)		227			719			285	164	
Turn Bay Length (ft)	240		505	245		625				
Base Capacity (vph)	236	2308	1075	255	2461	1134	298	310	247	374
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.19	0.08	0.33	0.09	0.01	0.28	0.26	0.05	0.02

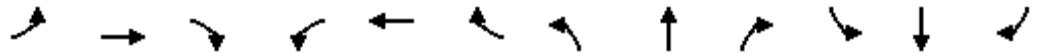
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Attachment 1

Roseville Fairway Dr Coffee Kiosk
2: Home Depot East Dwy/Home Depot & Fairway Dr

Existing plus Project Conditions
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	406	83	78	201	8	109	23	20	1	10	8
Future Volume (vph)	37	406	83	78	201	8	109	23	20	1	10	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98			1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1663			1855	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98			1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1663			1855	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	441	90	85	218	9	118	25	22	1	11	9
RTOR Reduction (vph)	0	0	37	0	0	3	0	16	0	0	0	9
Lane Group Flow (vph)	40	441	53	85	218	6	84	65	0	0	12	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases			4			8						1
Actuated Green, G (s)	4.6	52.8	52.8	8.5	56.7	56.7	9.0	9.0			2.4	2.4
Effective Green, g (s)	4.6	52.8	52.8	8.5	56.7	56.7	9.0	9.0			2.4	2.4
Actuated g/C Ratio	0.05	0.59	0.59	0.09	0.63	0.63	0.10	0.10			0.03	0.03
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	4.0			4.0	4.0
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.3	4.3	3.5	3.5			2.0	2.0
Lane Grp Cap (vph)	90	2076	928	167	2229	997	168	166			49	42
v/s Ratio Prot	c0.02	c0.12		c0.05	0.06		c0.05	0.04			c0.01	
v/s Ratio Perm			0.03			0.00						0.00
v/c Ratio	0.44	0.21	0.06	0.51	0.10	0.01	0.50	0.39			0.24	0.01
Uniform Delay, d1	41.5	8.8	8.0	38.8	6.6	6.2	38.4	37.9			42.9	42.6
Progression Factor	0.89	1.68	6.97	0.74	0.61	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	1.3	0.2	0.1	0.8	0.0	0.0	2.8	1.8			1.0	0.0
Delay (s)	38.2	15.0	55.6	29.7	4.0	6.2	41.1	39.7			43.9	42.7
Level of Service	D	B	E	C	A	A	D	D			D	D
Approach Delay (s)		23.0			11.1			40.4			43.3	
Approach LOS		C			B			D			D	

Intersection Summary

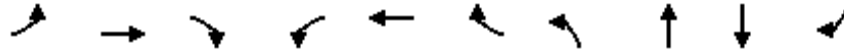
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Attachment 1

Roseville Fairway Dr Coffee Kiosk
 2: Home Depot East Dwy/Home Depot & Fairway Dr

Existing plus Project Conditions
 PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	52	808	91	97	790	5	153	153	39	36
v/c Ratio	0.37	0.44	0.10	0.54	0.40	0.01	0.59	0.57	0.30	0.12
Control Delay	38.5	26.1	10.2	38.3	9.7	0.0	44.1	40.8	44.8	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	26.1	10.2	38.3	9.7	0.0	44.1	40.8	44.8	0.9
Queue Length 50th (ft)	29	230	9	57	98	0	86	80	22	0
Queue Length 95th (ft)	66	311	53	m80	138	m0	142	135	52	0
Internal Link Dist (ft)		227			719			285	164	
Turn Bay Length (ft)	240		505	245		625				
Base Capacity (vph)	236	1837	882	255	1992	938	310	318	247	374
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.44	0.10	0.38	0.40	0.01	0.49	0.48	0.16	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Attachment 1

Roseville Fairway Dr Coffee Kiosk
2: Home Depot East Dwy/Home Depot & Fairway Dr

Existing plus Project Conditions
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	743	84	89	727	5	224	35	23	4	32	33
Future Volume (vph)	48	743	84	89	727	5	224	35	23	4	32	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97			0.99	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1677			1853	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97			0.99	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1677			1853	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	808	91	97	790	5	243	38	25	4	35	36
RTOR Reduction (vph)	0	0	46	0	0	2	0	8	0	0	0	34
Lane Group Flow (vph)	52	808	45	97	790	3	153	145	0	0	39	2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	7	4		3	8		2	2		1		1
Permitted Phases			4			8						1
Actuated Green, G (s)	5.0	44.3	44.3	9.0	48.3	48.3	13.9	13.9			5.5	5.5
Effective Green, g (s)	5.0	44.3	44.3	9.0	48.3	48.3	13.9	13.9			5.5	5.5
Actuated g/C Ratio	0.06	0.49	0.49	0.10	0.54	0.54	0.15	0.15			0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	4.0			4.0	4.0
Vehicle Extension (s)	2.0	4.3	4.3	2.0	4.3	4.3	3.5	3.5			2.0	2.0
Lane Grp Cap (vph)	98	1741	779	177	1899	849	259	259			113	96
v/s Ratio Prot	0.03	c0.23		c0.05	0.22		c0.09	0.09			c0.02	
v/s Ratio Perm			0.03			0.00						0.00
v/c Ratio	0.53	0.46	0.06	0.55	0.42	0.00	0.59	0.56			0.35	0.02
Uniform Delay, d1	41.4	15.0	11.9	38.6	12.4	9.7	35.4	35.2			40.5	39.7
Progression Factor	0.80	1.51	5.40	0.75	0.64	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	2.7	0.9	0.1	1.7	0.2	0.0	3.8	2.9			0.7	0.0
Delay (s)	35.9	23.5	64.7	30.5	8.2	9.7	39.2	38.1			41.2	39.8
Level of Service	D	C	E	C	A	A	D	D			D	D
Approach Delay (s)		28.1			10.6			38.6			40.5	
Approach LOS		C			B			D			D	

Intersection Summary

HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group