



N:\2010\Projects\2829_VillageGreenCirculation\GIS\MXD\Fig01_Ex_PHTV.mxd

1. Bass Lake Rd/Serrano Pkwy/Sienna Ridge Rd	2. Bass Lake Rd/Bridlewood Dr	3. Bass Lake Rd/Madera Wy
<p> Bass Lake Rd 61 (55) 672 (266) 4 (1) 3 (1) 2 (2) 8 (14) Serrano Pkwy 44 (76) 1 (2) 246 (114) 123 (170) 152 (493) 26 (1) Sienna Ridge Rd </p>	<p> Bass Lake Rd 651 (266) 17 (31) 30 (11) 74 (51) Bridlewood Dr 172 (491) 17 (87) </p>	<p> Bass Lake Rd 560 (232) 7 (14) 14 (12) 108 (65) Madera Wy 177 (404) 25 (98) </p>

- Stop Sign
- Turn Lane
- AM (PM)** Peak Hour Traffic Volume
- Traffic Signal
- Stop Sign

Figure 1
 Peak Hour Traffic Volumes
 and Lane Configurations -
 Existing Conditions
 19-1714 E 1 of 19



Intersection	Control	Peak Hour	Existing	
			Delay	LOS
Bass Lake Road / Bridlewood Drive	SSSC	AM	3 (22)	A (C)
		PM	2 (22)	A (C)
Bass Lake Road / Madera Way	SSSC	AM	3 (21)	A (C)
		PM	2 (18)	A (C)

Intersection	Control	Peak Hour	Existing	
			Delay	LOS
Bass Lake Road / Bridlewood Drive	AWSC	AM	34	D
		PM	19	C

Count Location	ADT									
	Tuesday (9-10-19)			Wednesday (9-11-19)			Thursday (9-12-19)			3-Day Average
	NB	SB	Total	NB	SB	Total	NB	SB	Total	
Bass Lake Rd s/o Green Valley Rd	3,166	3,140	6,306	3,117	3,157	6,274	3,286	3,316	6,602	6,394
Bass Lake Rd n/o Serrano Parkway	4,814	4,973	9,787	4,706	4,990	9,696	4,981	5,254	10,235	9,906
Bass Lake Rd n/o Country Club Dr	6,546	6,638	13,184	6,623	6,881	13,504	6,734	6,955	13,689	13,459

Count Location	AM Peak Hour Volumes							Threshold Volume	Delta b/w Threshold and Existing Volumes	LOS
	Tuesday (9-10-19)		Wednesday (9-11-19)		Thursday (9-12-19)		3-Day Average			
	Time	Total	Time	Total	Time	Total				
Bass Lake Rd s/o Green Valley Rd	7:00-8:00 AM	598	7:00-8:00 AM	583	7:00-8:00 AM	279	487	1,510	1,023	C
Bass Lake Rd n/o Serrano Parkway	7:00-8:00 AM	833	7:00-8:00 AM	824	7:00-8:00 AM	910	856	1,510	654	D
Bass Lake Rd n/o Country Club Dr	7:00-8:00 AM	1,135	7:00-8:00 AM	1,150	7:00-8:00 AM	1,195	1,160	1,510	350	D

Count Location	PM Peak Hour Volumes							Threshold Volume	Delta b/w Threshold and Existing Volumes	LOS
	Tuesday (9-10-19)		Wednesday (9-11-19)		Thursday (9-12-19)		3-Day Average			
	Time	Total	Time	Total	Time	Total				
Bass Lake Rd s/o Green Valley Rd	5:00-6:00 PM	525	5:00-6:00 PM	518	5:00-6:00 PM	515	519	1,510	991	C
Bass Lake Rd n/o Serrano Parkway	5:00-6:00 PM	831	5:00-6:00 PM	856	5:00-6:00 PM	890	859	1,510	651	D
Bass Lake Rd n/o Country Club Dr	5:00-6:00 PM	1,104	5:00-6:00 PM	1,107	5:00-6:00 PM	1,101	1,104	1,510	406	D

Prepared by National Data & Surveying Services

MAX QUEUE STUDY

Location: Bass Lake Rd & Bridlewood Dr

City: El Dorado Hills, CA

Date: 9/12/2019

Day: Thursday

Time	Max Queue Length (# of vehicles)
6:00 AM	4
6:15 AM	3
6:30 AM	2
6:45 AM	5
7:00 AM	3
7:15 AM	6
7:30 AM	4
7:45 AM	2
8:00 AM	3
8:15 AM	3
8:30 AM	3
8:45 AM	3
4:00 PM	2
4:15 PM	2
4:30 PM	1
4:45 PM	2
5:00 PM	3
5:15 PM	2
5:30 PM	3
5:45 PM	2
6:00 PM	4
6:15 PM	3
6:30 PM	2
6:45 PM	3

	AM	PM
MAX	6	4
Average	3	2



Major Street Bass Lake Rd
 Minor Street Madera Wy

Project Bass Lake Rd
 Scenario Existing (2019) Conditions
 Peak Hour AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	-	0	108
Through	177	557	0	0
Right	25	0	0	14
Total	202	557	0	122

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	20.6
Approach with Worst Case Delay	WB
Total Vehicles on Approach	122

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Existing (2019) Conditions	0.7	122	881
Limiting Value	5	150	650
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	<u>NO</u>		



Major Street **Bass Lake Rd**
 Minor Street **Madera Wy**

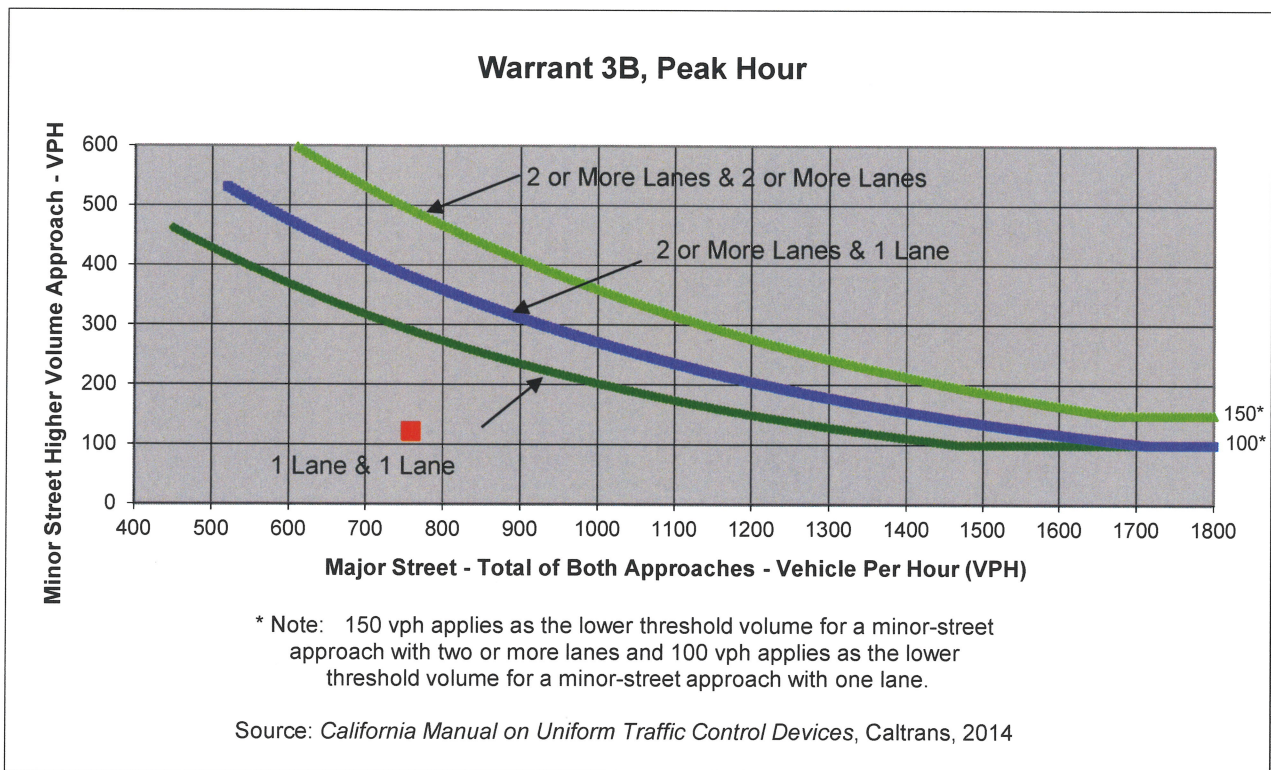
Project **Bass Lake Rd**
 Scenario **Existing (2019) Conditions**
 Peak Hour **AM**

Turn Movement Volumes

	NB	SB	EB	WB
Left		-		108
Through	177	557		
Right	25			14
Total	202	557	0	122

Major Street Direction

x North/South
 East/West



	Major Street	Minor Street	Warrant Met
	Bass Lake Rd	Madera Wy	
Number of Approach Lanes	1	2	<u>NO</u>
Traffic Volume (VPH) *	759	122	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Bass Lake Rd
 Minor Street Bridlewood Dr

Project Bass Lake Rd
 Scenario Existing (2019) Conditions
 Peak Hour AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	17	0	74
Through	170	651	0	0
Right	17	0	0	30
Total	187	668	0	104

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	21.6
Approach with Worst Case Delay	WB
Total Vehicles on Approach	104

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Existing (2019) Conditions	0.6	104	959
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Met	Met
Warrant Met	<u>NO</u>		



Major Street **Bass Lake Rd**
 Minor Street **Bridlewood Dr**

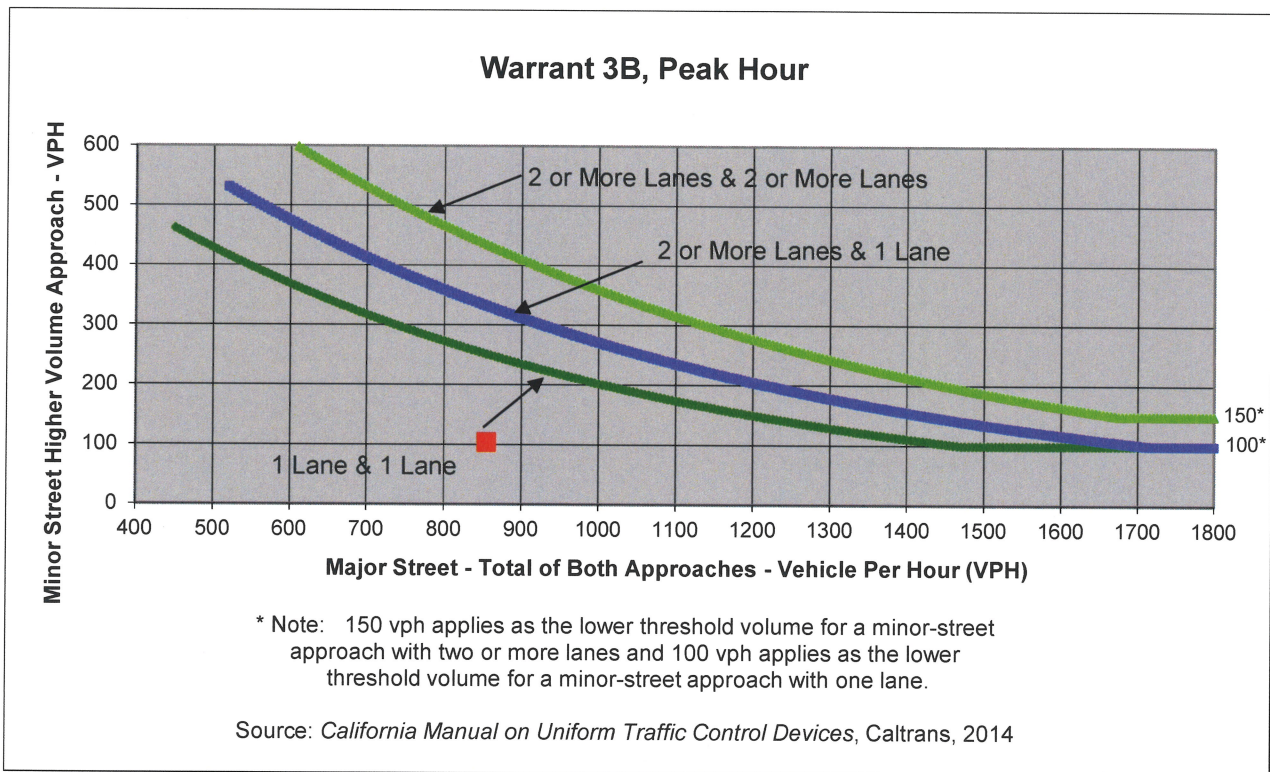
Project **Bass Lake Rd**
 Scenario **Existing (2019) Conditions**
 Peak Hour **AM**

Turn Movement Volumes

	NB	SB	EB	WB
Left		17		74
Through	170	651		
Right	17			30
Total	187	668	0	104

Major Street Direction

x North/South
 East/West



	Major Street	Minor Street	Warrant Met
	Bass Lake Rd	Bridlewood Dr	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	855	104	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Bass Lake Rd
 Minor Street Madera Wy

Project Bass Lake Rd
 Scenario Existing (2019) Conditions
 Peak Hour PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	14	0	65
Through	401	230	0	0
Right	97	0	0	12
Total	498	244	0	77

Major Street Direction

x North/South
 East/West

Intersection Geometry

Number of Approach Lanes for Minor Street 2
 Total Approaches 3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle) 17
 Approach with Worst Case Delay WB
 Total Vehicles on Approach 77

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Existing (2019) Conditions	0.4	77	819
Limiting Value	5	150	650
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	<u>NO</u>		



Major Street **Bass Lake Rd**
 Minor Street **Madera Wy**

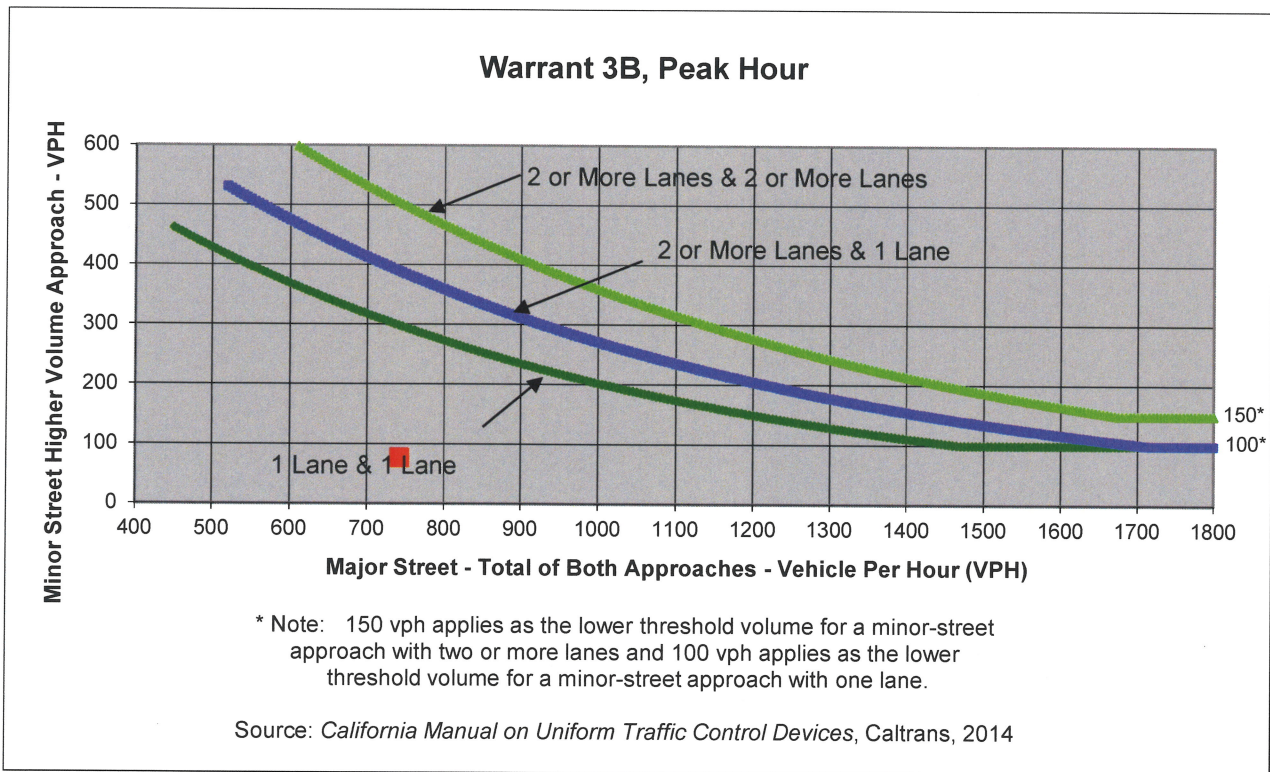
Project **Bass Lake Rd**
 Scenario **Existing (2019) Conditions**
 Peak Hour **PM**

Turn Movement Volumes

	NB	SB	EB	WB
Left		14		65
Through	401	230		
Right	97			12
Total	498	244	0	77

Major Street Direction

x North/South
 East/West



	Major Street	Minor Street	Warrant Met
	Bass Lake Rd	Madera Wy	
Number of Approach Lanes	1	2	<u>NO</u>
Traffic Volume (VPH) *	742	77	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street Bass Lake Rd
 Minor Street Bridlewood Dr

Project Bass Lake Rd
 Scenario Existing (2019) Conditions
 Peak Hour PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	31	0	51
Through	491	266	0	0
Right	87	0	0	11
Total	578	297	0	62

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	22
Approach with Worst Case Delay	WB
Total Vehicles on Approach	62

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Existing (2019) Conditions	0.4	62	937
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	<u>NO</u>		



Major Street Bass Lake Rd
 Minor Street Bridlewood Dr

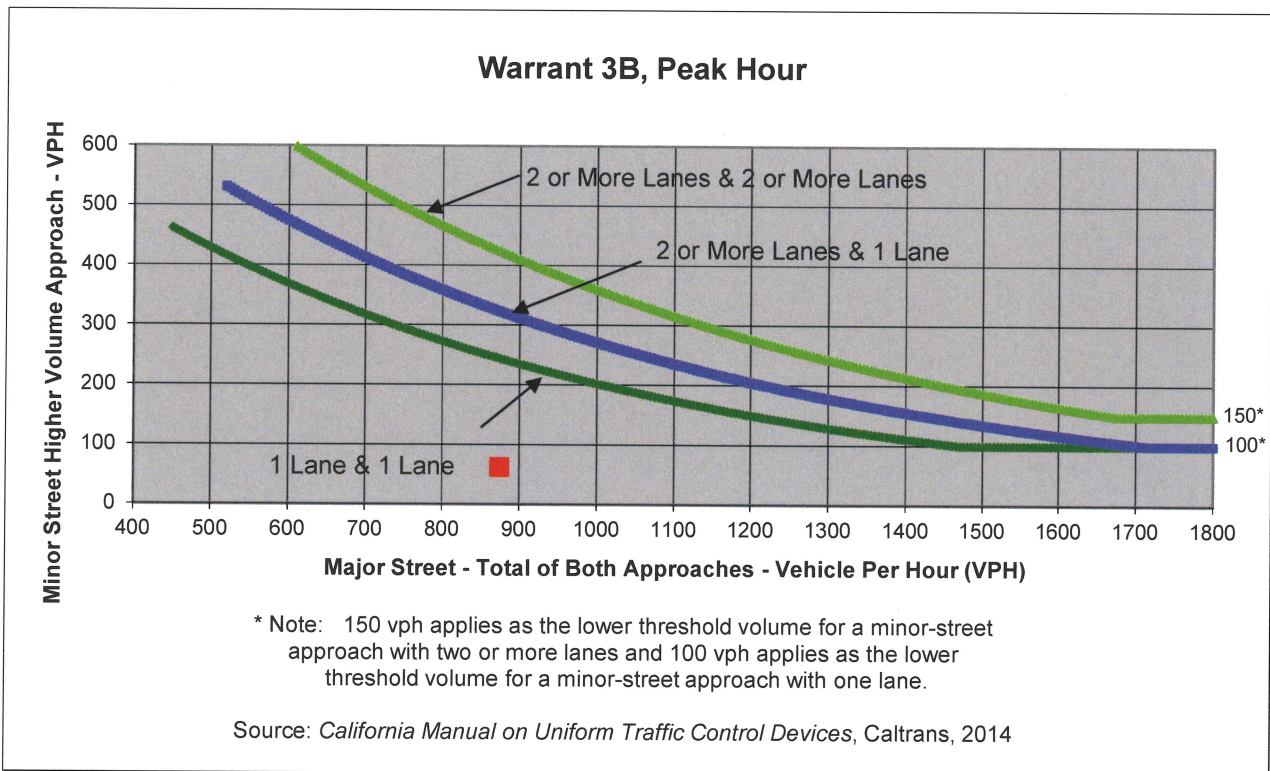
Project Bass Lake Rd
 Scenario Existing (2019) Conditions
 Peak Hour PM

Turn Movement Volumes

	NB	SB	EB	WB
Left		31		51
Through	491	266		
Right	87			11
Total	578	297	0	62

Major Street Direction

x North/South
 East/West



	Major Street	Minor Street	Warrant Met
	Bass Lake Rd	Bridlewood Dr	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	875	62	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

Table 1 – HCM 2010 and HCM 6th Edition Roadway Segment Thresholds by Facility Type

CLASS		HCM 2010 LOS					HCM 6 th Edition					Delta between HCM 6 th Edition and HCM 2010 LOS					
		A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
2R	Minor Two-Lane Highway	-	330	710	1,310	2,480	-	330	710	1,310	2,480	-	0	0	0	0	0
2U	Major Two-Lane Highway	-	330	710	1,310	2,480	-	330	710	1,310	2,480	-	0	0	0	0	0
4M	Multilane Four-Lane Highway	-	1,790	2,580	3,290	3,660	-	1,770	2,540	3,160	3,600	-	(20)	(40)	(130)	(60)	
2A	Two-Lane Arterial	-	-	850	1,540	1,650	-	-	640	1,310	1,510	-	-	(210)	(230)	(140)	
4AU	Four-Lane Arterial, Undivided	-	-	1,760	3,070	3,130	-	-	1,360	2,770	3,030	-	-	(400)	(300)	(100)	
4AD	Four-Lane Arterial, Divided	-	-	1,850	3,220	3,290	-	-	1,430	2,910	3,180	-	-	(420)	(310)	(110)	
6AD	Six-Lane Arterial, Divided	-	-	2,760	4,680	4,710	-	-	2,210	4,480	4,790	-	-	(550)	(200)	80	
2F	Two Freeway Lanes	-	2,070	2,880	3,590	4,150	-	2,150	2,960	3,610	4,100	-	80	80	20	(50)	
2FA	Two Freeway Lanes + Auxiliary Lane	-	2,610	3,630	4,520	5,230	-	3,150	3,960	4,610	5,100	-	540	330	90	(130)	
3F	Three Freeway Lanes	-	3,100	4,320	5,380	6,230	-	3,230	4,440	5,420	6,150	-	130	120	40	(80)	
3FA	Three Freeway Lanes + Auxiliary Lane	-	3,640	5,070	6,320	7,310	-	4,230	5,440	6,420	7,150	-	590	370	100	(160)	
4F	Four Freeway Lanes	-	4,140	5,760	7,180	8,310	-	4,300	5,930	7,220	8,200	-	160	170	40	(110)	
W22	Minor Two-Lane Highway	-	330	710	1,310	2,480	-	330	710	1,310	2,480	-	0	0	0	0	
W20	Minor Two-Lane Highway	-	330	710	1,310	2,480	-	330	710	1,310	2,480	-	0	0	0	0	
W18	Minor Two-Lane Highway	-	330	710	1,310	2,480	-	330	710	1,310	2,480	-	0	0	0	0	

Notes:

- (1) Threshold reductions between HCM 2010 and HCM 6th Edition are shown in red text and highlighted
- (2) HCM 2010 Freeway LOS based on Exhibit 10-8, Urban Area, Rolling Terrain, K-factor of 0.09, and D-factor of 0.60
- (3) HCM 6th Edition Freeway LOS based on Exhibits 12-39 and 12-40, Urban Area/Rural Area, Rolling Terrain, K-factor of 0.09, and D-factor of 0.60
- (4) HCM 2010 Multilane Highway LOS based on Exhibit 14-19, Urban Area/Rural Area, Rolling Terrain, K-factor of 0.09, and D-factor of 0.60
- (5) HCM 6th Edition Multilane Highway LOS based on Exhibits 12-41 and 12-42, Urban Area/Rural Area, Rolling Terrain, K-factor of 0.09, and D-factor of 0.60
- (6) HCM 2010 2-lane highway LOS based on Exhibit 15-30, Class II Rolling, 0.09 K-factor, and D-factor of 0.60
- (7) HCM 6th Edition 2-lane highway LOS based on Exhibit 15-46, Class II Rolling, 0.09 K-factor, and D-factor of 0.60
- (8) HCM 2010 Arterial LOS based on Exhibit 16-14, K-factor of 0.09, D-factor of 0.60, posted speed 45 mi/h
- (9) HCM 6th Edition Arterial LOS based on Exhibit 16-16, K-factor of 0.09, D-factor of 0.60, posted speed 45 mi/h



**COUNTY OF EL DORADO
DEPARTMENT OF TRANSPORTATION
INTEROFFICE MEMORANDUM**

Date: October 22, 2019

To: File

From: Natalie K. Porter, P.E., T.E.
Senior Traffic Engineer

Subject: *Bass Lake Road at Bridlewood Drive*

Fehr & Peers provided the following information to evaluate the need for a left turn pocket at Bridlewood Drive and Bass Lake Road.

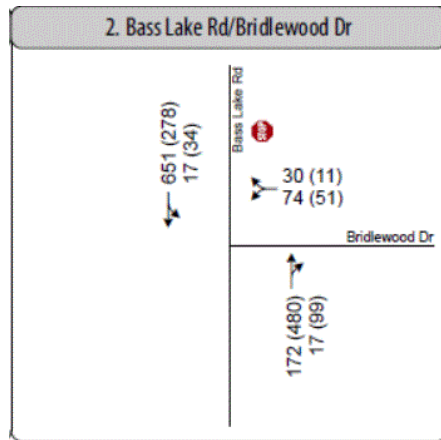
Evaluation Methodology

Guidance from the *National Cooperative Highway Research Program's* (NCHRP) Report 457 was applied to identify if a southbound left-turn pocket is needed at Bass Lake Road / Bridlewood Drive. The left-turn pocket warrant methodology considers the following inputs:

- Posted Speed
- Peak hour left-turn movement volume
- Peak hour volume in same direction as left-turn movement (Advancing Volume – V_A)
- Peak hour volume in opposite direction as left-turn movement (Opposing Volume – V_O)
- Left-turn movement peak hour volume as a percentage of V_A

The table below summarizes the inputs used for the evaluation of the left-turn pocket into Bridlewood Drive for PM peak hour conditions, which represents the highest peak hour for the left-turn movement.

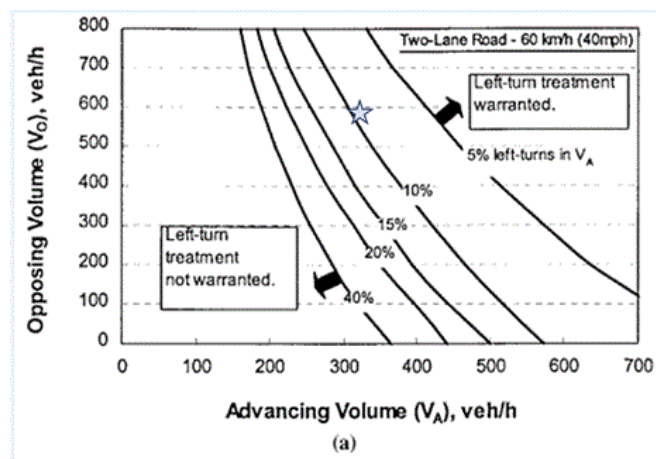
The values in the table were entered into the NCHRP 457 left-turn warrant model for a two-lane roadway with a posted speed limit of 40 miles per hour. The intersection of V_O and V_A is plotted on the model below and shown with a blue star. As shown, the intersection of V_O and V_A is right of the line that would represent 11% of left turns in V_A . Therefore, a southbound left-turn pocket is warranted.



Existing Counts (September 2019)
AM (PM) Peak Hour Traffic Volume

NCHRP 457 MODEL INPUTS – BASS LAKE ROAD / BRIDLEWOOD DRIVE	
Input	PM Peak Hour Value
Advancing Volume (V_A)	312
Left Turn Volume	34
% Left-turns in V_A	11%
Opposing Volume (V_O)	579

Source: Fehr & Peers, 2019



MEMORANDUM

Date: October 18, 2018
To: Andrea Howard, Parker Development
From: David B. Robinson, Fehr & Peers

Subject: Serrano Village J7

RS10-2829

Fehr & Peers has completed a left-turn warrant evaluation for Serrano Village J7. This memorandum outlines the proposed land use modifications for Serrano Village J7 and access, the evaluation methodology, and findings.

Land Use Modifications

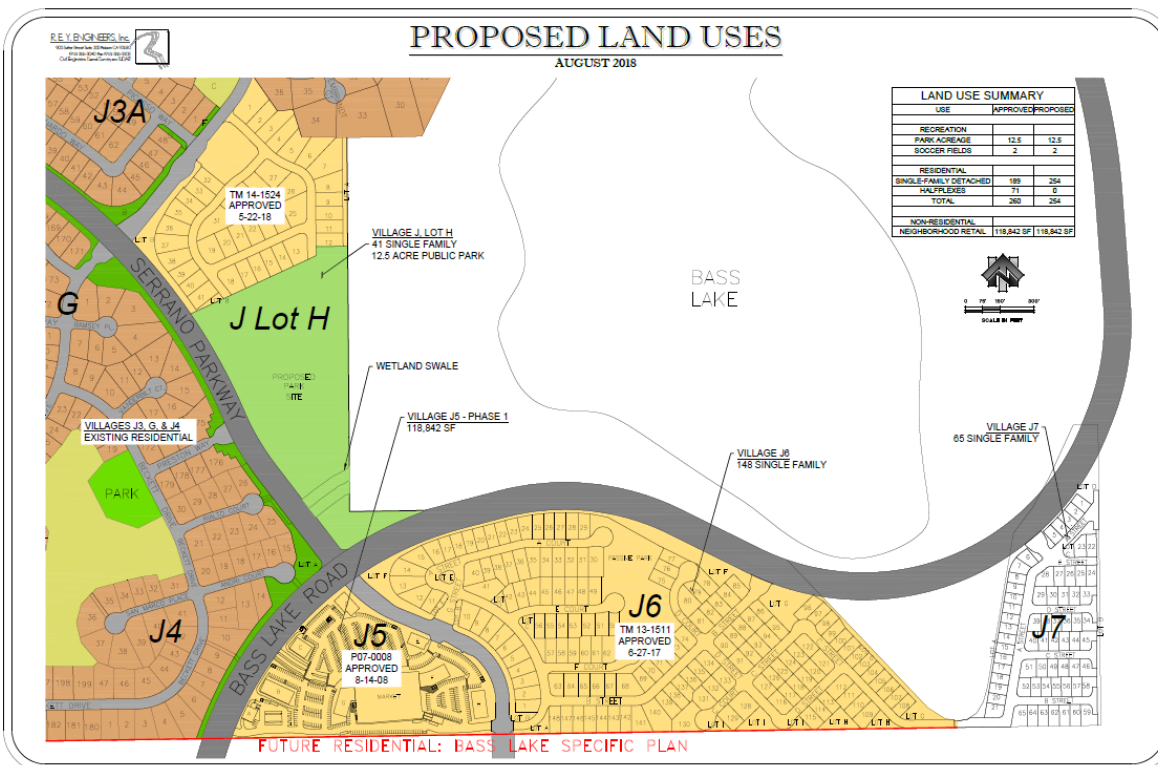
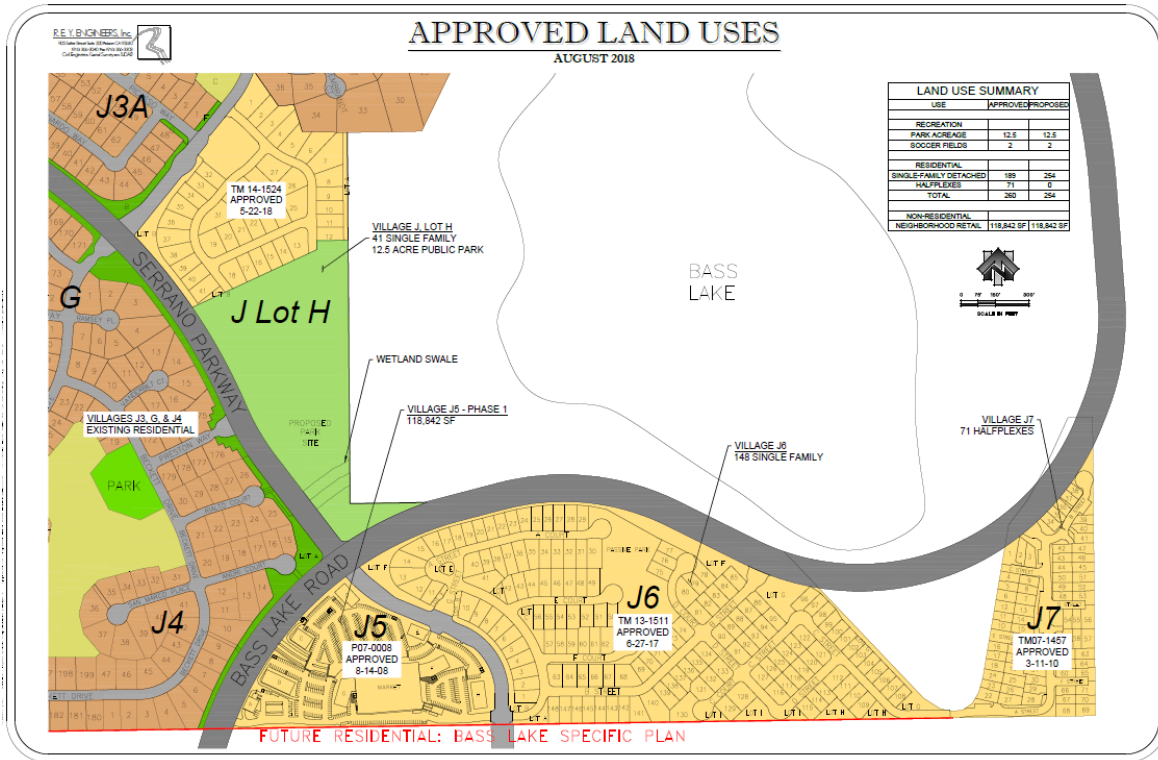
Table 1 compares approved and proposed land use for Serrano Village J7. Figure 1 shows the proposed changes. Village J7 is located east of the Bass Lake Road/Serrano Parkway Intersection. As proposed, the Village J7 residential dwelling units would be reduced from 71 single family halfplex units to 65 single family units.

Village	Approved Land Use	Proposed Land Use
J7	Residential (71 Single Family Halfplex Units)	Single Family Residential (65 Single Family Units)
Source: Fehr & Peers, 2018		

Access would continue to be provided by a full access connection to Bass Lake Road, located about 400 feet south of the Bass Lake Road/Bridlewood Drive intersection.



Figure 1: Approved and Proposed Land Uses



Evaluation Methodology

We applied guidance provided in *National Cooperative Highway Research Program (NCHRP) Report 457*, Transportation Research Board to identify if a southbound left-turn pocket is needed at the proposed access to Village J7. The left-turn pocket warrant methodology, considers the following inputs:

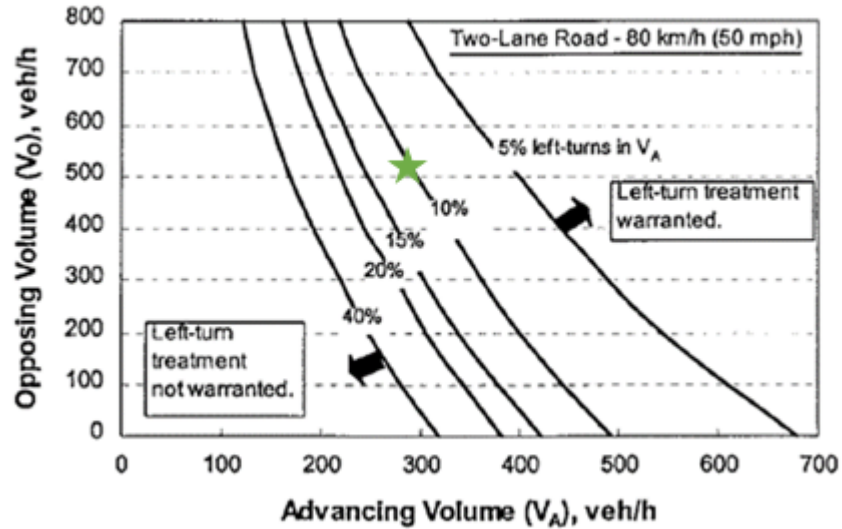
- Posted speed
- Peak hour left-turn movement volume
- Peak hour volume in same direction as left-turn movement (Advancing Volume – V_a)
- Peak hour volume in opposite direction as left-turn movement (Opposing Volume – V_o)
- Left-turn movement peak hour volume as a percentage of V_a

Table 2 summarizes the inputs used for the evaluation of the Village J7 left-turn pocket for PM peak hour conditions, which represents the highest peak hour for the left-turn movement.

Input	PM Peak Hour Value
Advancing Volume (V_a)	288
Left Turn Volume	11
% Left-turns in V_a	4%
Opposing Volume (V_o)	515
Source: Fehr & Peers, 2018	



The values in Table 2 were entered into the NCHRP 457 left-turn warrant model for a two-lane roadway with a posted speed limit of 50 miles per hour. The intersection of V_o and V_a is plotted on the model below and show with a green star. As shown, the intersection of V_o and V_a is left of the line that would represent 4% of left turns in V_a . Therefore, a left-turn pocket is not warranted.



Findings

As shown on the model above, the intersection of V_o and V_a is left of the line that representing 5% of left turns in V_a . Therefore, a left-turn pocket is not warranted. In addition, we tested the sensitivity of the warrant to the left-turn volume and determined that warrant would not be satisfied even if the left-turn movement into Village J7 was doubled.

