



June 6, 2019

Mr. Chris Winn
Asset Manager
Consolidated Investment Group
18 Inverness Place East
Englewood, CO 80112

Reference: Eastpark 70 Buildings 5, 6 and 7, Aurora, Colorado
Traffic Impact Letter
FHU Project Number 119234-01

Dear Mr. Winn:

Felsburg Holt & Ullevig (FHU) has completed a traffic assessment of Eastpark 70 Buildings 5, 6, and 7 in Aurora, Colorado. The site is located south of Smith Road between Ensenada Street and Himalaya Street, as shown on **Figure 1**. The site layout (including the buildings under study) is shown on **Figure 2**. Our assessment included developing trip generation for the additional buildings on the site, signal warrant analyses for the intersections of Smith Road/Ensenada Street and Smith Road/Himalaya Road, an evaluation of on-site circulation, and a review of existing truck access concerns expressed by the City of Aurora. Each of these efforts is documented below.

Background

The original plan for the Eastpark 70 project included 1.66 million square feet (msf) of light industrial uses on the current site. FHU documented the potential traffic impacts for this plan in a traffic impact study dated June 2005. The study called for signalization of both access points along Smith Road in the long-range development scenario.

Since that time, the anticipated development has been modified. The current plan includes approximately 823,650 square feet (sf) of cross-dock warehouse space in three buildings and approximately 487,400 sf of light industrial uses in eight buildings. Five additional light industrial pad sites totaling 70,120 sf are undeveloped; there are currently no plans to develop these pad sites. The total development now represents approximately 1.38 msf.

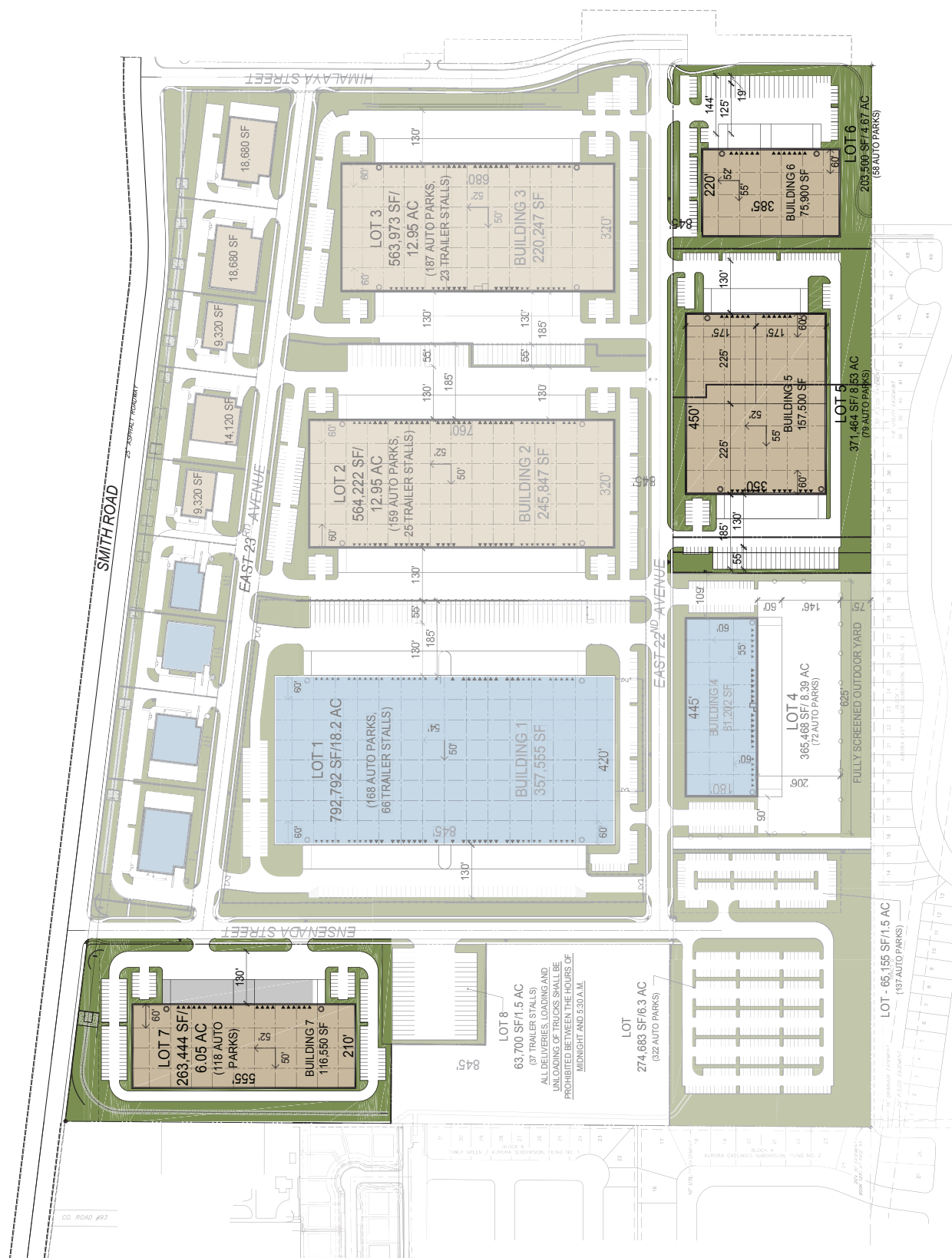
In early 2017, the first warehouse building (referred to as Building 1) was developed for the United Parcel Service (UPS). FHU evaluated traffic signal warrants related to the development of this building and documented our conclusions in a conformance letter report dated May 10, 2017. The letter report did not recommend signalization.

Later in 2017, the remaining two warehouse buildings (referred to as Buildings 2 and 3) were advanced for other tenants. FHU evaluated traffic signal warrants related to the development of these buildings and documented our conclusions in a conformance letter report dated August 4, 2017. The letter report did not recommend signalization.

The current evaluation reflects the existing light industrial and warehouse buildings and three proposed light industrial sites, totaling 349,950 sf. As noted above, present-day efforts include trip generation, signal warrant analyses, site circulation evaluations, and a truck access review.



FIGURE 2



Data Collection

FHU conducted a site visit on April 29, 2019, to review and document existing conditions and review existing truck access. Refer to **Figure 2**. The following items were noted:

- The existing UPS facility (Building 1) was closed for interior renovations, and no active shipping was observed.
- Building 2 was observed to be partially occupied. Discussions with Consolidated Investment Group indicate that this building is currently approximately 60 percent leased.
- Building 3 was observed to be under construction.
- Building 4 was observed to be fully occupied.
- The four smaller light industrial buildings between East 23rd Avenue and Smith Road were observed to have varying levels of occupancy and related activity.
- Construction staff vehicles and delivery trucks were observed to be parked along East 23rd Avenue and East 22nd Avenue near the Building 3 construction site, despite signs precluding parking along these roadways.
- There is one warehouse-style building located along the east side of Himalaya Road opposite East 22nd Avenue that is not associated with the Eastpark 70 site. This building was observed to be occupied and active during the site visit.
- The arterial and collector roadways surrounding the site were reviewed for truck access conditions and restrictions. The data collected are summarized later in this letter report.

The signal warrant analyses included a 72-hour traffic count data collection effort, which was conducted on middle weekdays during the week of May 6, 2019. The average daily traffic traveling Smith Road, west of Ensenada Street is approximately 4,050 vehicles per day (vpd). East of Himalaya Road, Smith Road serves approximately 3,050 vpd. Ensenada Street carries approximately 1,250 vpd and Himalaya Road has approximately 800 vpd. The raw traffic counts are attached to this letter.

Traffic Volumes and Projections

As noted above, the existing traffic counts account for Building 4, the four light industrial buildings along East 23rd Avenue, and 60 percent of Building 2. Volumes for other previously approved on-site development were developed as follows:

- Traffic volumes for Building 1 were retrieved from the May 10, 2017, letter report and added to the counted volumes. As shown in that letter report, Building 1 will result in approximately 1,460 daily trips, with 17 trips occurring in the AM peak hour and 231 trips occurring in the PM peak hour. Traffic for this building was assigned to the street network using the trip distribution in the associated letter report. This traffic was added to the counted volumes.
- Traffic volumes for the remaining 40 percent of Building 2 and for all of Building 3 were estimated using the ITE Trip Generation Manual, 10th Edition. These buildings represent warehousing uses, so ITE Land Use Code 150 – Warehousing was applied. This is consistent with the August 14, 2017, effort. However, the calculations represent a change from the 2017 letter report, as the Trip Generation Manual has been updated since that work was completed. The resulting trip generation is higher than the results in the 2017 effort, representing a conservative update. The combined 40 percent from Building 2 and all of Building 3 will result in approximately 595 daily trips, with 89 trips occurring in the AM peak hour and 94 trips occurring in the PM peak hour. Traffic for this building was assigned to the street network using the trip distribution in the associated letter report. This traffic was also added to the counted volumes.

The resulting background traffic volumes provide a representation of conditions with the currently approved on-site development, before the development of Buildings 5, 6, and 7. They are summarized in **Table 1**.

Table 1. Background Trip Generation

Land Use	ITE Code	KSF	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
				In	Out	Total	In	Out	Total
Building 1 – UPS (not operating)	n/a	357.56	1,460	13	4	17	225	6	231
Building 2 – (60 percent occupied)	150	245.85	201 ¹	28 ¹	9 ¹	37 ¹	11 ¹	29 ¹	40 ¹
Building 3 – (under construction)	150	220.25	394	40	12	52	15	39	54
Background Trip Generation - Existing / Approved Buildings			2,055	81	25	106	251	74	325

Note:

¹ Trip generation calculated using 98.34 ksf (40% of 245.85 ksf) to reflect currently unoccupied space.

The three new light industrial buildings are located on parcels 5, 6, and 7, totaling 19.25 acres.

- Building 5 is located south of East 22nd Avenue between Ensenada Street and Himalaya Street, and is proposed to include 157,500 sf. All access is provided from East 22nd Avenue.
- Building 6 is located south of East 22nd Avenue and west of Himalaya Street, and is proposed to include 75,900 sf. All access is provided from East 22nd Avenue.
- Building 7 is located west of Ensenada Street opposite East 23rd Avenue, and is proposed to include 116,550 sf. All access is provided from Ensenada Street.

Figure 2 shows the site plan, including parcel access points for each proposed lot. No specific users are identified at this time. Traffic volumes for each building were estimated using the ITE Trip Generation Manual, 10th Edition. These buildings represent light industrial uses, so ITE Land Use Code 110 – Light Industrial was applied. The daily trips and peak hour forecasts are shown in **Table 2**.

Table 2. Future Trip Generation

Land Use	ITE Code	KSF	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
				In	Out	Total	In	Out	Total
Building 5	110	157.50	781	97	13	110	13	86	99
Building 6	110	75.90	376	47	6	53	6	42	48
Building 7	110	116.55	578	72	10	82	9	64	73
Future Trip Generation - Proposed Buildings			1,735	216	29	245	28	192	220

The above information was used to generate the projected daily and peak hour trip forecasts for the proposed development. As **Table 2** indicates, the development of Buildings 5, 6, and 7 will result in approximately 1,735 daily drips, with 245 trips occurring in the AM peak hour and 220 trips occurring in the PM peak hour. **Table 3** was developed to provide the estimated trip generation of the site for a 24-hour period based on the 24-hour counts on Smith Road and forecasted site trip generation. The 24-hour trip generation was used to assess signal warrants.

Table 3. Site Generated Trips

Time Period	Inbound Trips	Outbound Trips
12:00 AM	13	30
1:00 AM	13	17
2:00 AM	7	31
3:00 AM	13	45
4:00 AM	7	34
5:00 AM	71	28
6:00 AM	191	59
7:00 AM	134	60
8:00 AM	98	67
9:00 AM	100	82
10:00 AM	195	67
11:00 AM	213	88
12:00 PM	116	107
1:00 PM	94	110
2:00 PM	83	83
3:00 PM	45	307
4:00 PM	67	106
5:00 PM	264	114
6:00 PM	34	67
7:00 PM	36	40
8:00 PM	32	16
9:00 PM	43 ¹	255 ¹
10:00 PM	23	51
11:00 PM	12	43
Total Trips	1904	1907

Note:

¹Significant evening trip generation associated with the UPS building, as documented in the May 10, 2017 study.

It is assumed that 15 percent of the site trips would access the site to/from the east and 85 percent to/from the west along Smith Road, given the I-70/E-470 interchange being located to the east and I-70/Tower Road interchange being located to the west of the site. Site traffic is assumed to use both Ensenada Street and Himalaya Road to access Smith Road, with 40 percent of the traffic using Himalaya Road and 60 percent using Ensenada Street. This is a change from previous evaluations, which assumed 2/3 of site traffic using Himalaya Road and 1/3 on Ensenada Street. The revised volumes are based on our traffic counts at these two streets and the fact that Buildings 5, 6, and 7 are spread more evenly across the site.

Signal Warrant Analyses

The intersections of Smith Road/Ensenada Street and Smith Road/Himalaya Road were evaluated for traffic signalization warrants as described in the 10th Edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). Per the request of the City of Aurora, 72-hour approach counts were completed along Smith Road, Ensenada Street, and Himalaya Road. See the appendix for traffic counts. **Figure 3** shows the existing lane geometry and traffic control at both intersections.

FHU evaluated each of the nine traffic signal warrants outlined in the MUTCD to determine whether the intersections of Smith Road/Ensenada Street and Smith Road/Himalaya Road should be signalized according to MUTCD guidelines. Each of the nine traffic signal warrants are described below.

Warrant 1, Eight-Hour Vehicular Volume

Warrant 1 is satisfied when, for 8 or more hours of an average day, traffic volumes along the major street and the higher-volume minor street approach exceed the threshold values specified in Table 4C-1 of the MUTCD. Threshold values in Condition A – Minimum Vehicular Volume are applicable at intersections where large volumes of entering traffic are the primary reason for considering signalization. Thresholds in Condition B – Interruption of Continuous Traffic are useful when volumes on a major street are high such that vehicles on the minor street suffer excessive delay or conflict when attempting to enter or cross the major street. These threshold values can be adjusted to account for the number of lanes provided on each intersection approach, higher roadway speeds, or rural population areas. Warrant 1 is satisfied when Condition A or Condition B is met. Warrant 1 is also satisfied when 80 percent of the threshold traffic volumes in Condition A and Condition B are exceeded.

Warrant 2, Four-Hour Vehicular Volume

Warrant 2 is fulfilled when traffic volumes for the major street and the higher volume minor street plot above the threshold guidelines as represented on Figure 4C-1 or 4C-2 of the MUTCD for any 4 hours of an average day for the existing combination of approach lanes. These threshold values can be adjusted to account for the number of lanes provided on each intersection approach, higher roadway speeds, or rural population areas.

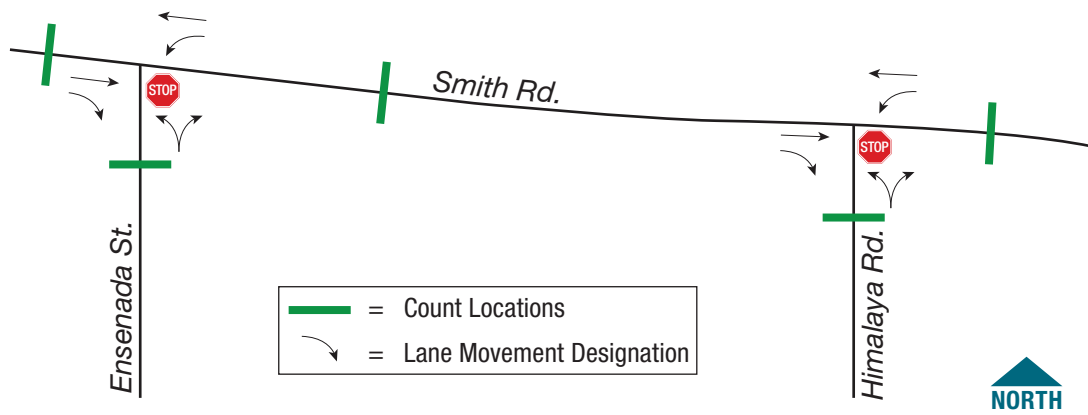
Warrant 3, Peak Hour

Warrant 3 is intended for application where traffic conditions are such that for 1 hour of the day minor street traffic suffers undue delay in entering or crossing the major street. This warrant may also be satisfied when traffic volumes for the major street (total of both approaches) and the higher volume minor street approach plot above the threshold guidelines as represented on Figure 4C-3 or 4C-4 of the MUTCD for the existing combination of approach lanes during the peak hour of the day.

The 2009 Edition of the MUTCD includes the following statement in the Peak Hour Warrant description:

This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Per this statement, Warrant 3 must be used with caution and should not be a sole justification for signalization of a typical public street intersection.



Warrant 4, Pedestrian Volume

More than 107 pedestrians for each of any 4 hours (or 75 pedestrians for Rural intersections), or 133 pedestrians in a single hour (or 93 pedestrians for Rural intersections) must be found to cross the major street. In addition, the distance to the nearest traffic signal cannot be less than 300 feet or it must be determined that the proposed traffic control signal will not restrict the progressive movement of traffic.

Warrant 5, School Crossing

Warrant 5 is intended to be used if the fact that schoolchildren cross the major street is the principle reason to consider signalization. A minimum of 20 schoolchildren must be observed using the crossing location during the highest hour. A traffic engineering study of the frequency and duration of gaps in the vehicular traffic stream at the crossing must show that the number of adequate gaps in the traffic stream during the period when children are using the crossing is less than the number of minutes in the same period. For example, if the number of adequate vehicle gaps in a 15-minute period is less than 15, then a traffic signal could be warranted. Finally, other mitigation measures should be considered to provide gaps at the location, including warning signs, school speed zones, and crossing guards.

Warrant 6, Coordinated Signal System

Based on Warrant 6, a signal can be installed if there is a need to maintain proper grouping of vehicles and effectively regulate group speed. If adjacent signals do not provide the necessary degree of platooning and speed control, and the proposed and adjacent signals could constitute a progressive signal system, then a traffic signal could be warranted.

Warrant 7, Crash Experience

Warrant 7 specifies that, when five or more reported accidents in a 1-year period that are susceptible to correction by traffic signal control are found, each involving personal injury or property damage, then a traffic signal may be implemented, dependent on meeting other criteria.

Warrant 8, Roadway Network

A traffic signal installation may be warranted to encourage concentration and organization of traffic flow on a roadway network. Warrant 8 applies only to the intersection of two major routes (specific criteria apply). Traffic volume criteria must also be met.

Warrant 9, Intersection Near a Grade Crossing

Warrant 9 specifies the need for a traffic signal only if a railroad grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line of the approach.

No pedestrian amenities are provided along the north side of Smith Road, adjacent to the existing UPRR freight railroad corridor. Hence, no pedestrian crossings of the major street are expected, and Warrant 4 – Pedestrian Volume and Warrant 5 – School Crossing were not evaluated. There is no signal to the east along Smith Road to create platoons, so Warrant 6 – Coordinated Signal System was not evaluated. Crash data from the Vision Zero software suite¹ were extracted for the study intersections. A total of three crashes (one at Ensenada Street and two at Himalaya Road) were found over the 5-year period between January 1, 2012 and December 31, 2017. Hence, Warrant 7 was not further evaluated. Warrant 8 requires that both roadways are major routes, and the Eastpark 70 approaches to Smith Road are not major routes. Warrant 9 relates to an at-grade rail crossing, and no such crossing exists so this warrant was not evaluated. These assumptions are consistent with the City's request to only evaluate Warrants 1, 2, and 3.

¹ Vision Zero Suite, DiExSys, LLC, Colorado statewide dataset, accessed 5/30/19.

Warrant Analysis Summary – Smith Road / Ensenada Street

The following information was used as the base data to analyze the MUTCD warrants for the intersection of Smith Road and Ensenada Street:

- Major Street Approach: Smith Road
- Minor Street Approach: Ensenada Street
- Major Street Posted Speed: 40 MPH
- Minor Street Posted Speed: 25 MPH
- Traffic Control: Stop sign on minor street approach
- Peak One Hour of Weekday Vehicle Activity: 3:00 PM – 4:00 PM

One-Lane or Two-Lane Approaches

The MUTCD allows the use of engineering judgment in determining the laneage for the major and minor streets at an intersection. Approaches may be characterized as either one-lane or two-lane based on the vehicle movements allowed at the approach and the turning volumes using left turn lanes.

- **Smith Road** – The eastbound approach includes a through lane and a right-turn lane, and the westbound approach includes a through lane and a left-turn lane. Smith Road was analyzed as a one-lane approach based on the existence of one through lane in each direction at the intersection. The one-lane approach distinction was used based on guidance from the MUTCD that states that *“the approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles.”* This guidance was not met on this approach.
- **Ensenada Street** – The northbound approach consists of a shared left / right lane. This approach was analyzed as a one-lane approach.

The results for Warrants 1, 2, and 3 at the Smith Road / Ensenada Street intersection are summarized in **Table 4**. As can be seen, this intersection does not meet warrants.

Table 4. Results of Signal Warrant Analysis –Smith Road / Ensenada Street

Warrant	Warrant Met?		Comments
	Yes	No	
Warrant 1 – Eight-Hour Vehicular Volume		✓	Are volumes sufficient? ¹ - Condition A: 0 of 8 hours met - Condition B: 0 of 8 hours met - Condition C: 0 of 8 hours met
Warrant 2 – Four-Hour Vehicular Volume		✓	Are volumes sufficient? - 0 of 4 hours met
Warrant 3 – Peak Hour		✓	This warrant should be applied only in unusual cases such as where office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities attract or discharge large numbers of vehicles over a short time. This intersection was reviewed for this but does not meet the warrant.

Note:

- ¹Warrant 1: Condition A – Minimum Vehicular Volume
Condition B – Interruption of Continuous Traffic
Condition C – 80 percent Fulfillment of Condition A and Condition B

Warrant Analysis Summary – Smith Road / Himalaya Road

Summary of Conditional Data

The following information was used as the base data to analyze the MUTCD warrants for the intersection of Smith Road and Himalaya Road:

- Major Street Approach: Smith Road
- Minor Street Approach: Himalaya Road
- Major Street Posted Speed: 40 MPH
- Minor Street Posted Speed: 25 MPH
- Traffic Control: Stop sign on minor street approach
- Peak One Hour of Weekday Vehicle Activity: 4:30 PM – 5:30 PM

One-Lane or Two-Lane Approaches

As noted above, the MUTCD allows the use of engineering judgment to determine approach laneage.

- **Smith Road** – The eastbound approach includes a through lane and a right-turn lane, and the westbound approach includes a through lane and a left-turn lane. Smith Road was analyzed as a one-lane approach based on the existence of one through lane in each direction at the intersection.
- **Himalaya Road** – The northbound approach consists of a shared left and right lane. This approach was analyzed as a one-lane approach.

The results for Warrants 1, 2, and 3 at the Smith Road / Himalaya Road intersection are summarized in **Table 5**. As can be seen, this intersection does not meet warrants.

Table 5. Results of Signal Warrant Analysis – Smith Road / Himalaya Road

Warrant	Warrant Met?		Comments
	Yes	No	
Warrant 1 – Eight-Hour Vehicular Volume		✓	Are volumes sufficient? ¹ - Condition A: 0 of 8 hours met - Condition B: 2 of 8 hours met - Condition C: 0 of 8 hours met
Warrant 2 – Four-Hour Vehicular Volume		✓	Are volumes sufficient? - 0 of 4 hours met
Warrant 3 – Peak Hour		✓	This warrant should be applied only in unusual cases such as where office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities attract or discharge large numbers of vehicles over a short time. This intersection was reviewed for this but does not meet the warrant.

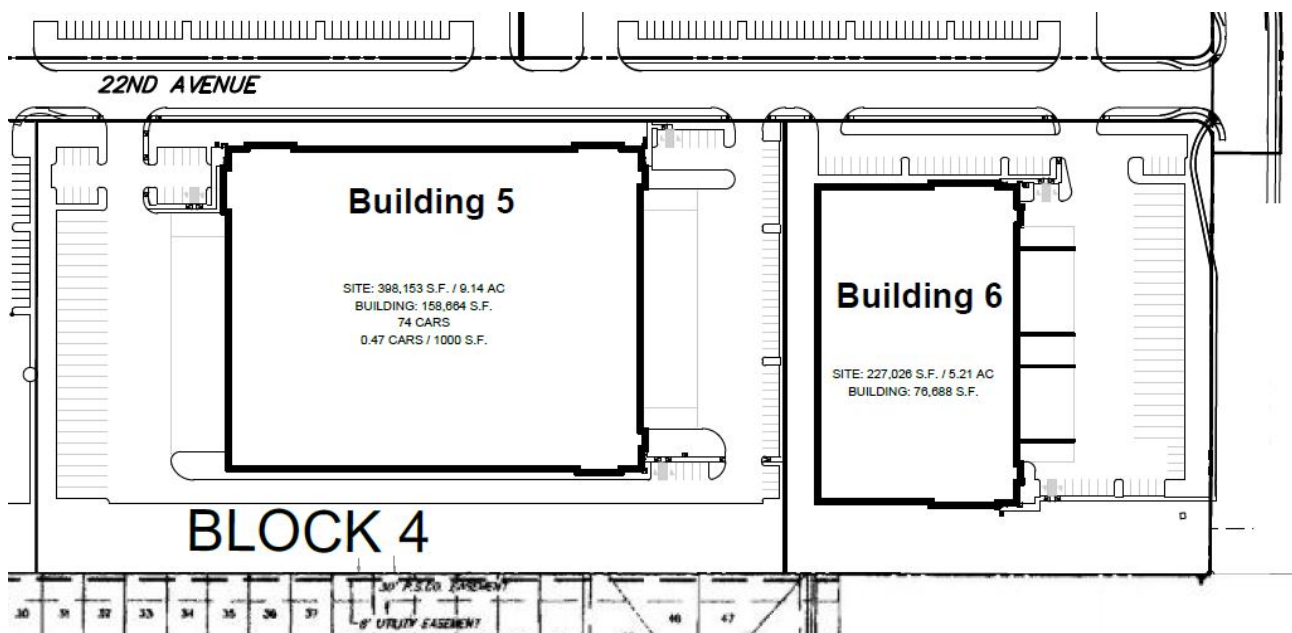
Note:

- ¹Warrant 1: Condition A – Minimum Vehicular Volume
Condition B – Interruption of Continuous Traffic
Condition C – 80 percent Fulfillment of Condition A and Condition B

Site Circulation Plan Evaluation

The existing roadway network within the site has been constructed and is currently in use. The development of Buildings 5, 6, and 7 will not modify this network. Given the volumes collected along Himalaya Road and Ensenada Street, the existing stop control for the East 23rd Avenue approaches to these roadways appear reasonable. The East 22nd Avenue approaches were yield controlled when previous evaluations were completed. Yield or stop control on these approaches continues to be appropriate.

The access points for each building were also reviewed as part of the circulation evaluation. No issues were noted with the access for Buildings 5 and 7. However, the easterly access for Building 6 shown on **Figure 2** falls outside of the spacing guidelines in City standards². Based on previous City comments, we understand that you have modified the lot plan for Building 6 as shown below. This modification (to be included in future submittals) meets the referenced section in City Standards.

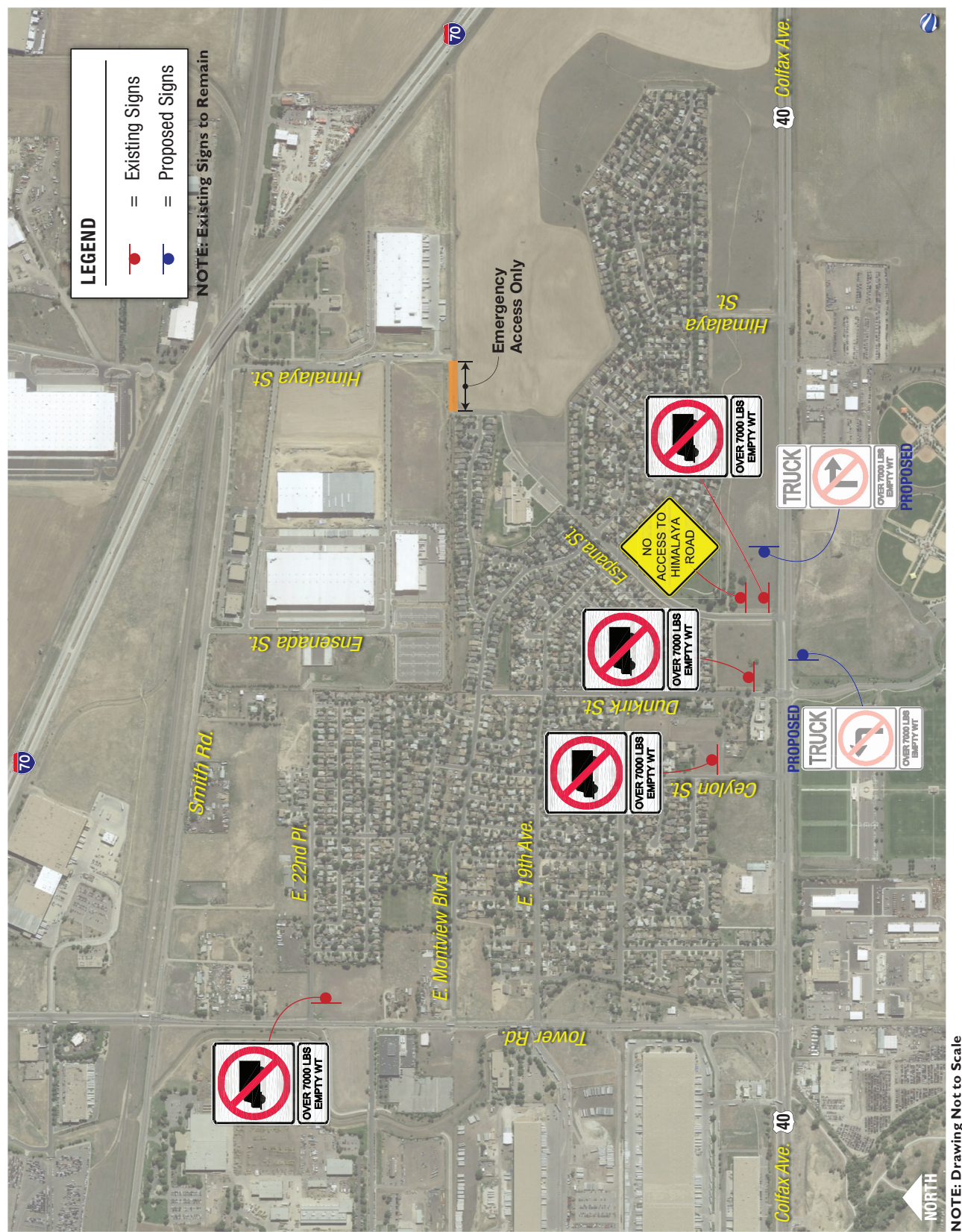


Truck Sign Survey

The City has requested that the applicant review truck signing in the areas south of Eastpark 70 due to neighborhood complaints regarding larger trucks attempting to access the site from the south. FHU staff conducted a windshield survey of the arterials and collectors in the Tower Triangle area bounded by Colfax Avenue on the south, Tower Road on the west, and I-70 on the northeast. No truck restrictions or related signing were noted along Colfax Avenue, Tower Road, or Smith Road.

Collectors and local streets that could be viewed as connections between these arterials and the Eastpark 70 site were also reviewed. East 22nd Place, Ceylon Street, Dunkirk Street, and Espana Street were posted with truck prohibitions near their intersections with East Colfax Avenue or Tower Road. Refer to **Figure 4**. These signs generally show that trucks are precluded from the neighborhood south and east of Eastpark 70. However, trucks along Tower Road and East Colfax Avenue do not encounter these signs until they have turned from the arterial onto the neighborhood roadways. Hence, trucks are required to turn around in the neighborhood even if they do not travel through the neighborhood toward the Eastpark 70 site. As part of the effort, FHU also reviewed the zoning maps for this area to determine locations where trucks may need access to serve existing or planned commercial developments. Improvement recommendations for each access listed above are described in more detail below.

² Roadway Design and Construction Specifications, City of Aurora, October 2016, Section 4.07.7.02.5.5.05



East 22nd Place – This street has a truck prohibition sign about 100 feet east of Tower Road. Due to the commercial nature of the first developed parcel on the north side of East 22nd Place east of Tower, this sign should be moved east to approximately Carmel Drive to maintain truck access for current development. Future zoning calls for industrial land uses along the north side of East 22nd Place to this parcel, and commercial uses along the south side between Tower Road and the existing residential neighborhood. Hence, the relocated signs would be appropriately placed for future development.

East Montview Boulevard – This street does not have a truck prohibition sign east of Tower Road, but it is connected well into the neighborhood to the east. Due to the industrial nature of the first developed parcel on the north side of East Montview Boulevard east of Tower and the adjacent utility parcel, a new sign should be placed approximately 500 feet east of Tower Road in the short term. The south side of East Montview Boulevard in this area is zoned residential. If the industrial parcels are rezoned to residential in the future, the relocation of this sign closer to Tower Road should be evaluated.

Ceylon Street – This street has a truck prohibition sign less than 50 feet north of East 16th Avenue, or about one block north of East Colfax Avenue. This is where the roadway transitions from undeveloped land along East Colfax Avenue to residential development north of East 16th Avenue. The undeveloped land is currently zoned for commercial land uses, so the location of this sign appears appropriate for both existing and future development.

Dunkirk Street – This street has a truck prohibition sign about 150 feet north of East Colfax Avenue, at approximately the northern property limit of the existing gas station across the street. The west side of the roadway transitions from the gas station to residential development further north. The east side of the street is currently vacant but is zoned for residential land uses. Hence, the location of this sign appears appropriate for both existing and future development.

Espana Street – This street has a truck prohibition sign about 50 feet north of East Colfax Avenue and an additional warning sign noting that there is no connection to Himalaya Street about 150 feet north of East Colfax Avenue. Given the extra warning sign, it is assumed that the truck access issue has been prevalent at this location. The existing Triangle Park begins about 400 feet north of East Colfax Avenue on the east side of Espana Street, and the existing residential begins about 500 feet north on the opposite side of the street. The vacant land adjacent to Espana Street between East Colfax Avenue and the existing development is currently zoned for additional residential uses. Hence, there is no expectation that Espana Street will serve truck traffic into the future. We recommend that additional signing be added along East Colfax Avenue approaching Espana Street, with appropriate turn prohibitions. These are noted on **Figure 4**. Coordination with CDOT (since they operate East Colfax Avenue as US 40) is recommended for sign placement.

Truck Sign Conclusions

There are existing truck prohibition signs in place in the Tower Triangle neighborhood, but their effectiveness is limited due to sign placement. Espana Street presents an opportunity for precluding truck turns before they enter the neighborhood. At the remaining locations, existing commercial and/or industrial land uses preclude truck turning prohibitions into the area. Based on the evaluations above, one sign relocation and three new truck prohibition sign installations are recommended.

Summary

Based on the evaluation of the MUTCD signal warrants, it is recommended that both intersections of Smith Road/Ensenada Street and Smith Road/Himalaya Road NOT be considered for signalized traffic control at this time. The signal warrants at these two intersections are far from being satisfied given the traffic projections outlined in this report. One site circulation concern was identified; this issue has been corrected in coordination with the City of Aurora. Additional truck routing signage is proposed at the neighborhood entries south of the site to address truck circulation issues identified by the City of Aurora.

Please call if you have any questions.

Sincerely,

FELSBURG HOLT & ULLEVIG



Christopher J. Fasching, PE, PTOE
Principal



Paul F. Brown, PE, PTOE
Associate

Attachments:

- Traffic Counts
- Graphs for Warrant 2 and Warrant 3
- HCM Synchro Outputs for Peak Hour Warrant Analysis

Site Code: 1
Station ID: 1
ENSENADA ST S/O SMITH RD

Start Time	07-May-19 Tue	NB	SB							Total
12:00 AM		2	1							3
01:00		0	2							2
02:00		5	1							6
03:00		19	3							22
04:00		2	1							3
05:00		4	57							61
06:00		20	137							157
07:00		31	90							121
08:00		37	48							85
09:00		53	50							103
10:00		43	55							98
11:00		58	36							94
12:00 PM		79	73							152
01:00		71	43							114
02:00		54	34							88
03:00		42	15							57
04:00		43	15							58
05:00		65	26							91
06:00		23	6							29
07:00		8	3							11
08:00		2	5							7
09:00		5	6							11
10:00		8	7							15
11:00		1	4							5
Total		675	718							1393
Percent		48.5%	51.5%							
AM Peak	-	11:00	06:00	-	-	-	-	-	-	06:00
Vol.	-	58	137	-	-	-	-	-	-	157
PM Peak	-	12:00	12:00	-	-	-	-	-	-	12:00
Vol.	-	79	73	-	-	-	-	-	-	152

Site Code: 1
Station ID: 1
ENSENADA ST S/O SMITH RD

Start Time	08-May-19 Wed	NB	SB							Total
12:00 AM		3	4							7
01:00		1	1							2
02:00		1	1							2
03:00		16	1							17
04:00		4	2							6
05:00		3	48							51
06:00		11	125							136
07:00		21	79							100
08:00		30	47							77
09:00		34	49							83
10:00		43	37							80
11:00		42	28							70
12:00 PM		74	74							148
01:00		41	50							91
02:00		54	17							71
03:00		53	19							72
04:00		51	14							65
05:00		104	27							131
06:00		23	8							31
07:00		5	6							11
08:00		9	4							13
09:00		1	2							3
10:00		4	5							9
11:00		1	1							2
Total		629	649							1278
Percent		49.2%	50.8%							
AM Peak	-	10:00	06:00	-	-	-	-	-	-	06:00
Vol.	-	43	125	-	-	-	-	-	-	136
PM Peak	-	17:00	12:00	-	-	-	-	-	-	12:00
Vol.	-	104	74	-	-	-	-	-	-	148

Site Code: 1
Station ID: 1
ENSENADA ST S/O SMITH RD

Start Time	09-May-19 Thu	NB	SB							Total
12:00 AM		2	2							4
01:00		0	0							0
02:00		0	0							0
03:00		17	1							18
04:00		1	4							5
05:00		5	37							42
06:00		9	118							127
07:00		30	65							95
08:00		34	52							86
09:00		27	36							63
10:00		36	27							63
11:00		45	29							74
12:00 PM		50	53							103
01:00		36	42							78
02:00		50	20							70
03:00		36	20							56
04:00		44	12							56
05:00		98	22							120
06:00		20	2							22
07:00		15	5							20
08:00		2	3							5
09:00		2	7							9
10:00		5	2							7
11:00		0	1							1
Total		564	560							1124
Percent		50.2%	49.8%							
AM Peak	-	11:00	06:00	-	-	-	-	-	-	06:00
Vol.	-	45	118	-	-	-	-	-	-	127
PM Peak	-	17:00	12:00	-	-	-	-	-	-	17:00
Vol.	-	98	53	-	-	-	-	-	-	120
Grand Total		1868	1927							3795
Percent		49.2%	50.8%							
ADT		ADT 1,265	AADT 1,265							

Site Code: 2
Station ID: 2
HIMALAYA RD S/O SMITH RD

Start Time	07-May-19 Tue	NB	SB							Total
12:00 AM		3	10							13
01:00		2	12							14
02:00		10	17							27
03:00		10	4							14
04:00		4	10							14
05:00		15	31							46
06:00		17	65							82
07:00		9	48							57
08:00		13	40							53
09:00		19	54							73
10:00		12	27							39
11:00		14	19							33
12:00 PM		30	17							47
01:00		31	29							60
02:00		17	12							29
03:00		16	17							33
04:00		29	8							37
05:00		26	10							36
06:00		25	16							41
07:00		10	12							22
08:00		6	42							48
09:00		5	16							21
10:00		6	9							15
11:00		6	4							10
Total		335	529							864
Percent		38.8%	61.2%							
AM Peak	-	09:00	06:00	-	-	-	-	-	-	06:00
Vol.	-	19	65	-	-	-	-	-	-	82
PM Peak	-	13:00	20:00	-	-	-	-	-	-	13:00
Vol.	-	31	42	-	-	-	-	-	-	60

Site Code: 2
Station ID: 2
HIMALAYA RD S/O SMITH RD

Start Time	08-May-19 Wed	NB	SB							Total
12:00 AM		9	10							19
01:00		2	7							9
02:00		6	5							11
03:00		5	7							12
04:00		8	4							12
05:00		6	10							16
06:00		21	43							64
07:00		16	30							46
08:00		16	41							57
09:00		14	33							47
10:00		13	26							39
11:00		17	12							29
12:00 PM		14	24							38
01:00		15	28							43
02:00		15	16							31
03:00		15	12							27
04:00		29	8							37
05:00		27	12							39
06:00		20	6							26
07:00		16	21							37
08:00		2	18							20
09:00		9	24							33
10:00		6	12							18
11:00		9	3							12
Total		310	412							722
Percent		42.9%	57.1%							
AM Peak	-	06:00	06:00	-	-	-	-	-	-	06:00
Vol.	-	21	43	-	-	-	-	-	-	64
PM Peak	-	16:00	13:00	-	-	-	-	-	-	13:00
Vol.	-	29	28	-	-	-	-	-	-	43

All Traffic Data Services
www.alltrafficdata.net

Site Code: 2
Station ID: 2
HIMALAYA RD S/O SMITH RD

Start Time	09-May-19 Thu	NB	SB							Total
12:00 AM		9	10							19
01:00		5	7							12
02:00		4	5							9
03:00		6	7							13
04:00		4	4							8
05:00		11	10							21
06:00		22	46							68
07:00		23	33							56
08:00		20	44							64
09:00		21	35							56
10:00		8	28							36
11:00		25	12							37
12:00 PM		30	14							44
01:00		19	23							42
02:00		12	23							35
03:00		14	14							28
04:00		19	9							28
05:00		9	12							21
06:00		12	14							26
07:00		10	10							20
08:00		13	41							54
09:00		14	15							29
10:00		7	11							18
11:00		8	13							21
Total		325	440							765
Percent		42.5%	57.5%							
AM Peak Vol.	-	11:00 25	06:00 46	-	-	-	-	-	-	06:00 68
PM Peak Vol.	-	12:00 30	20:00 41	-	-	-	-	-	-	20:00 54
Grand Total		970	1381							2351
Percent		41.3%	58.7%							
ADT		ADT 784	AADT 784							

Site Code: 3
Station ID: 3
SMITH RD W/O ENSENADA ST

Start Time	07-May-19 Tue	EB	WB							Total
12:00 AM		20	11							31
01:00		15	9							24
02:00		21	23							44
03:00		14	47							61
04:00		39	35							74
05:00		163	89							252
06:00		375	120							495
07:00		282	165							447
08:00		188	133							321
09:00		190	122							312
10:00		176	118							294
11:00		207	133							340
12:00 PM		159	164							323
01:00		148	172							320
02:00		147	172							319
03:00		132	168							300
04:00		145	212							357
05:00		198	244							442
06:00		144	124							268
07:00		74	66							140
08:00		81	42							123
09:00		67	38							105
10:00		42	41							83
11:00		29	33							62
Total		3056	2481							5537
Percent		55.2%	44.8%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	06:00
Vol.	-	375	165	-	-	-	-	-	-	495
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	198	244	-	-	-	-	-	-	442

Site Code: 3
Station ID: 3
SMITH RD W/O ENSENADA ST

Start Time	08-May-19 Wed	EB	WB							Total
12:00 AM		21	19							40
01:00		13	12							25
02:00		9	17							26
03:00		20	33							53
04:00		38	28							66
05:00		148	83							231
06:00		338	113							451
07:00		210	177							387
08:00		129	156							285
09:00		133	104							237
10:00		147	135							282
11:00		118	139							257
12:00 PM		146	151							297
01:00		123	111							234
02:00		102	153							255
03:00		133	181							314
04:00		142	152							294
05:00		194	222							416
06:00		114	130							244
07:00		75	58							133
08:00		46	41							87
09:00		47	40							87
10:00		35	39							74
11:00		16	18							34
Total		2497	2312							4809
Percent		51.9%	48.1%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	06:00
Vol.	-	338	177	-	-	-	-	-	-	451
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	194	222	-	-	-	-	-	-	416

All Traffic Data Services
www.alltrafficdata.net

Site Code: 3
Station ID: 3
SMITH RD W/O ENSENADA ST

Start Time	09-May-19	EB	WB							Total
12:00 AM		23	18							41
01:00		8	12							20
02:00		11	12							23
03:00		10	38							48
04:00		35	20							55
05:00		150	86							236
06:00		291	106							397
07:00		191	148							339
08:00		137	141							278
09:00		130	111							241
10:00		114	112							226
11:00		165	133							298
12:00 PM		154	153							307
01:00		147	125							272
02:00		120	150							270
03:00		144	165							309
04:00		152	157							309
05:00		180	216							396
06:00		115	122							237
07:00		72	71							143
08:00		55	33							88
09:00		83	46							129
10:00		30	31							61
11:00		31	25							56
Total		2548	2231							4779
Percent		53.3%	46.7%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	06:00
Vol.	-	291	148	-	-	-	-	-	-	397
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	180	216	-	-	-	-	-	-	396
Grand Total		8101	7024							15125
Percent		53.6%	46.4%							
ADT		ADT 5,042	AADT 5,042							

Site Code: 4
Station ID: 4
SMITH RD E/O ENSENADA ST

Start Time	07-May-19 Tue	EB	WB							Total
12:00 AM		14	12							26
01:00		12	6							18
02:00		21	19							40
03:00		13	26							39
04:00		36	29							65
05:00		99	76							175
06:00		227	104							331
07:00		163	132							295
08:00		101	109							210
09:00		99	73							172
10:00		85	70							155
11:00		111	72							183
12:00 PM		71	83							154
01:00		99	140							239
02:00		104	114							218
03:00		105	128							233
04:00		120	154							274
05:00		163	150							313
06:00		121	101							222
07:00		59	51							110
08:00		55	37							92
09:00		44	28							72
10:00		25	32							57
11:00		18	28							46
Total		1965	1774							3739
Percent		52.6%	47.4%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	06:00
Vol.	-	227	132	-	-	-	-	-	-	331
PM Peak	-	17:00	16:00	-	-	-	-	-	-	17:00
Vol.	-	163	154	-	-	-	-	-	-	313

Site Code: 4
Station ID: 4
SMITH RD E/O ENSENADA ST

Start Time	08-May-19 Wed	EB	WB							Total
12:00 AM		18	19							37
01:00		10	10							20
02:00		9	15							24
03:00		20	19							39
04:00		31	30							61
05:00		90	78							168
06:00		190	101							291
07:00		137	161							298
08:00		100	150							250
09:00		103	85							188
10:00		120	111							231
11:00		94	112							206
12:00 PM		87	103							190
01:00		91	100							191
02:00		93	102							195
03:00		119	124							243
04:00		128	117							245
05:00		172	135							307
06:00		105	110							215
07:00		69	54							123
08:00		36	41							77
09:00		44	41							85
10:00		27	46							73
11:00		17	17							34
Total		1910	1881							3791
Percent		50.4%	49.6%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	190	161	-	-	-	-	-	-	298
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	172	135	-	-	-	-	-	-	307

Site Code: 4
Station ID: 4
SMITH RD E/O ENSENADA ST

Start Time	09-May-19 Thu	EB	WB							Total
12:00 AM		18	19							37
01:00		12	22							34
02:00		12	15							27
03:00		11	28							39
04:00		32	29							61
05:00		100	101							201
06:00		162	140							302
07:00		131	157							288
08:00		83	105							188
09:00		92	88							180
10:00		79	75							154
11:00		120	90							210
12:00 PM		93	108							201
01:00		89	98							187
02:00		92	103							195
03:00		97	133							230
04:00		125	102							227
05:00		160	129							289
06:00		95	97							192
07:00		50	58							108
08:00		43	33							76
09:00		46	40							86
10:00		16	24							40
11:00		17	24							41
Total		1775	1818							3593
Percent		49.4%	50.6%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	06:00
Vol.	-	162	157	-	-	-	-	-	-	302
PM Peak	-	17:00	15:00	-	-	-	-	-	-	17:00
Vol.	-	160	133	-	-	-	-	-	-	289
Grand Total		5650	5473							11123
Percent		50.8%	49.2%							
ADT		ADT 3,708	AADT 3,708							

Site Code: 5
Station ID: 5
SMITH RD E/O HIMALAYA RD

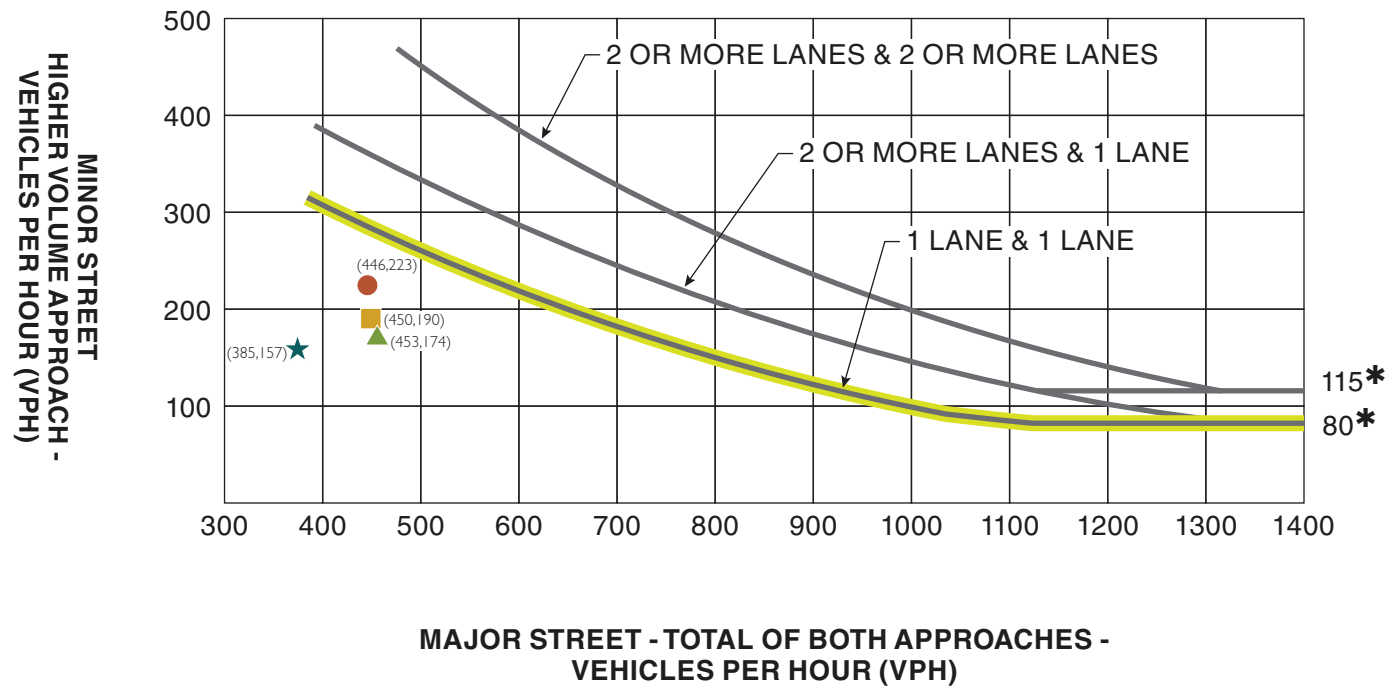
Start Time	07-May-19 Tue	EB	WB							Total
12:00 AM		11	9							20
01:00		11	6							17
02:00		18	16							34
03:00		11	20							31
04:00		29	24							53
05:00		81	62							143
06:00		187	85							272
07:00		134	110							244
08:00		84	89							173
09:00		81	60							141
10:00		70	57							127
11:00		92	59							151
12:00 PM		59	69							128
01:00		81	115							196
02:00		86	94							180
03:00		86	106							192
04:00		100	127							227
05:00		134	124							258
06:00		100	83							183
07:00		49	42							91
08:00		46	30							76
09:00		36	24							60
10:00		21	26							47
11:00		15	23							38
Total		1622	1460							3082
Percent		52.6%	47.4%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	06:00
Vol.	-	187	110	-	-	-	-	-	-	272
PM Peak	-	17:00	16:00	-	-	-	-	-	-	17:00
Vol.	-	134	127	-	-	-	-	-	-	258

Site Code: 5
Station ID: 5
SMITH RD E/O HIMALAYA RD

Start Time	08-May-19 Wed	EB	WB							Total
12:00 AM		15	16							31
01:00		8	8							16
02:00		7	11							18
03:00		16	15							31
04:00		26	25							51
05:00		74	65							139
06:00		156	84							240
07:00		112	133							245
08:00		83	124							207
09:00		85	70							155
10:00		99	91							190
11:00		78	91							169
12:00 PM		72	85							157
01:00		75	82							157
02:00		76	85							161
03:00		97	102							199
04:00		105	96							201
05:00		142	112							254
06:00		86	91							177
07:00		57	44							101
08:00		29	33							62
09:00		36	34							70
10:00		22	38							60
11:00		13	14							27
Total		1569	1549							3118
Percent		50.3%	49.7%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	156	133	-	-	-	-	-	-	245
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	142	112	-	-	-	-	-	-	254

Site Code: 5
Station ID: 5
SMITH RD E/O HIMALAYA RD

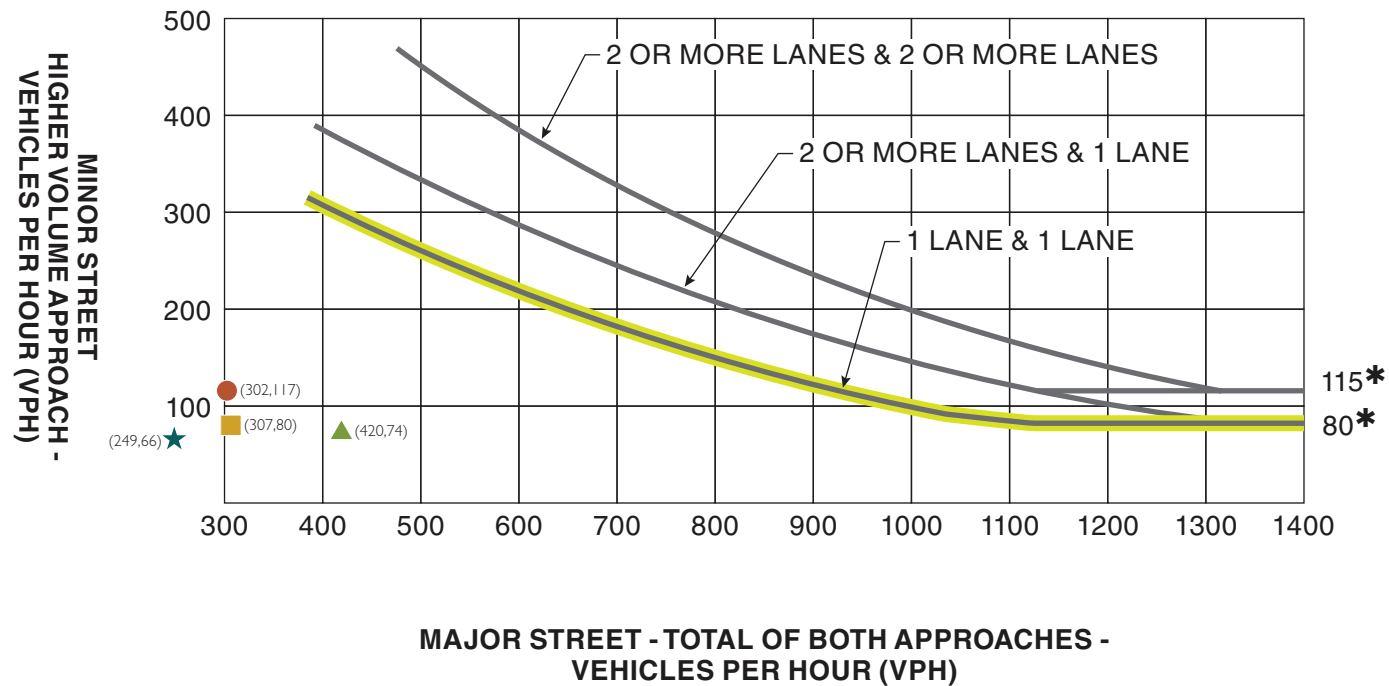
Start Time	09-May-19 Thu	EB	WB							Total
12:00 AM		14	15							29
01:00		10	18							28
02:00		11	12							23
03:00		8	23							31
04:00		26	24							50
05:00		82	83							165
06:00		134	115							249
07:00		109	130							239
08:00		68	87							155
09:00		76	72							148
10:00		65	62							127
11:00		99	74							173
12:00 PM		76	90							166
01:00		74	81							155
02:00		75	85							160
03:00		81	109							190
04:00		102	85							187
05:00		132	107							239
06:00		78	80							158
07:00		41	48							89
08:00		35	28							63
09:00		38	34							72
10:00		13	20							33
11:00		14	19							33
Total		1461	1501							2962
Percent		49.3%	50.7%							
AM Peak	-	06:00	07:00	-	-	-	-	-	-	06:00
Vol.	-	134	130	-	-	-	-	-	-	249
PM Peak	-	17:00	15:00	-	-	-	-	-	-	17:00
Vol.	-	132	109	-	-	-	-	-	-	239
Grand Total		4652	4510							9162
Percent		50.8%	49.2%							
ADT		ADT 3,708	AADT 3,708							



* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

LEGEND

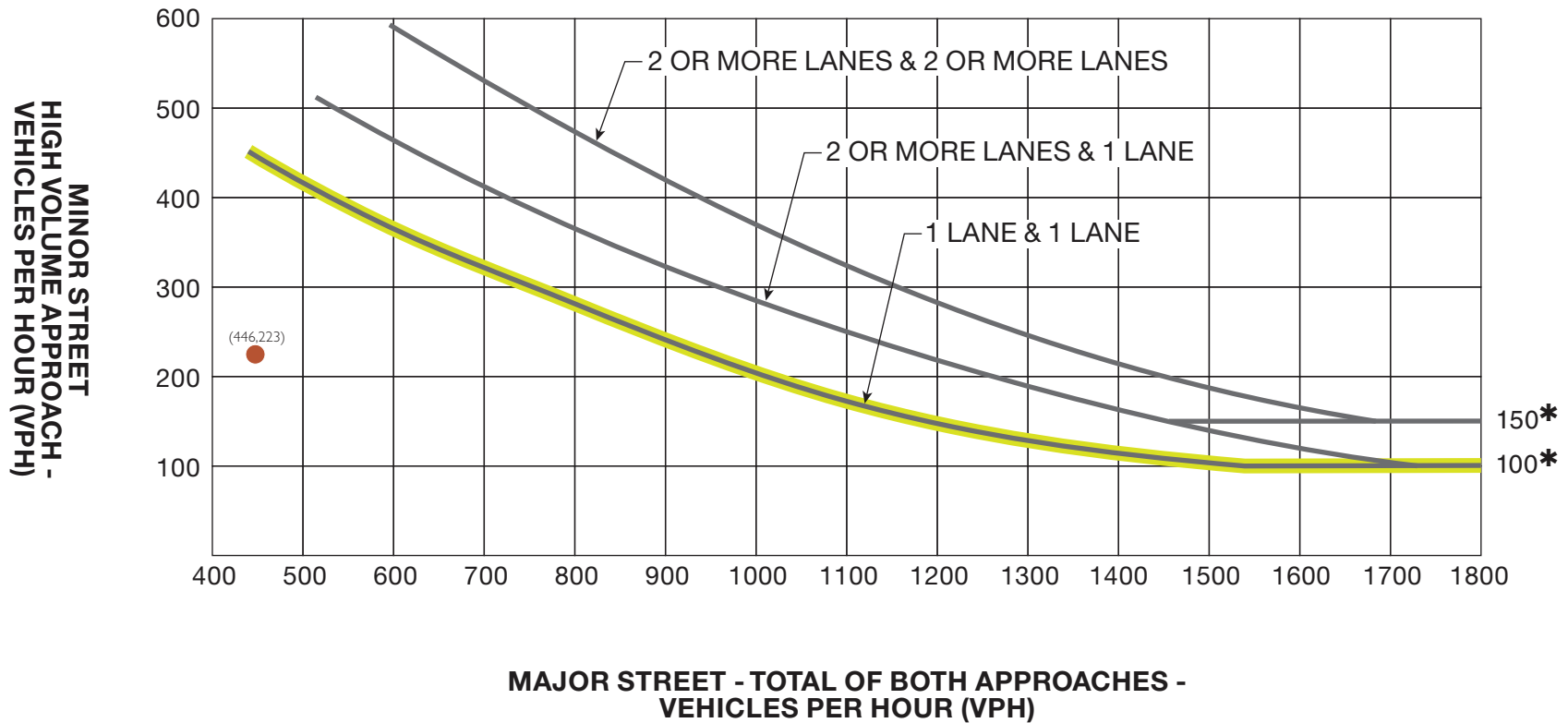
- = 11:45am - 12:45pm
- = 1:00pm - 2:00pm
- ▲ = 5:00pm - 6:00pm
- ★ = 2:15pm - 3:15pm



* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

LEGEND

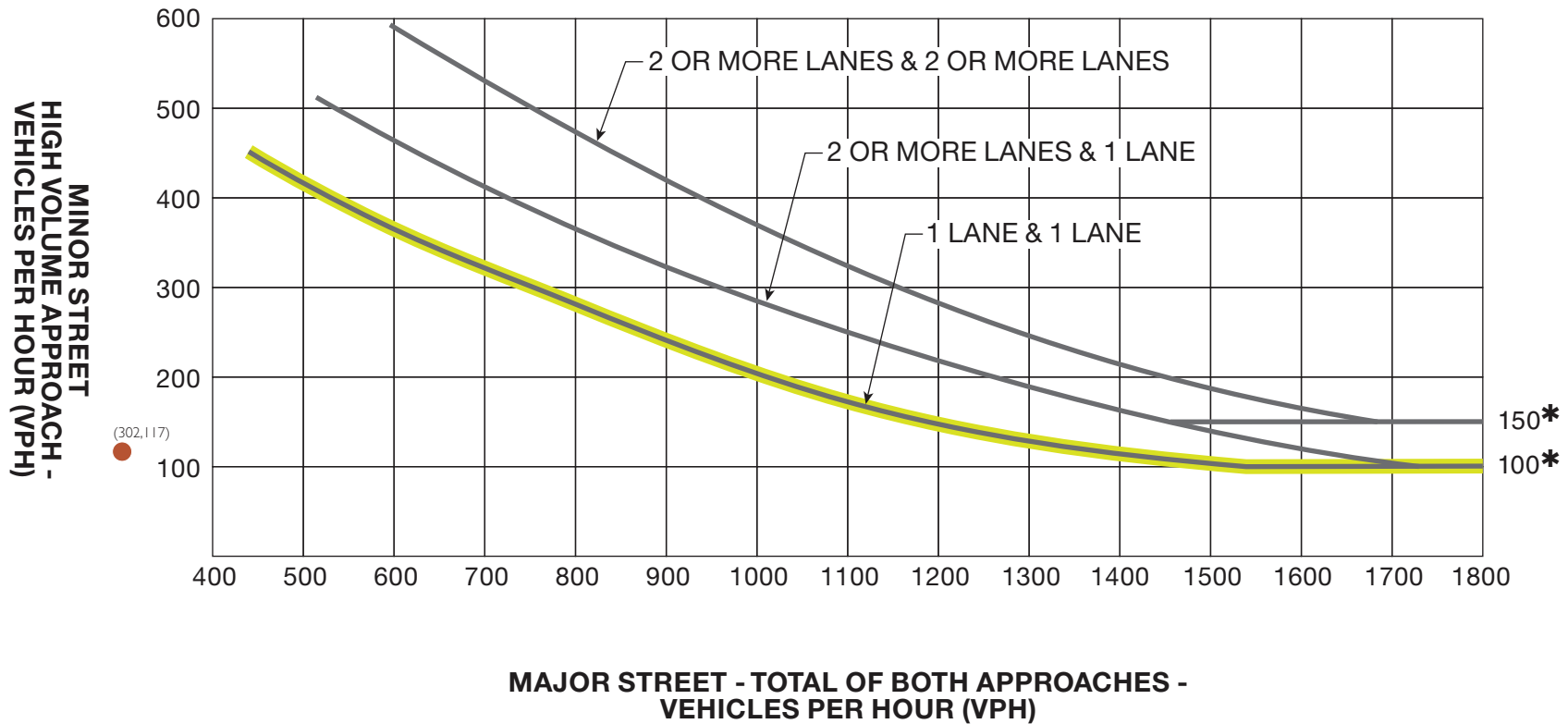
- = 4:30pm - 5:30pm
- = 5:30pm - 6:30pm
- ▲ = 6:30am - 7:30am
- ★ = 3:30pm - 4:30pm



* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

LEGEND

● = 11:45am - 12:45pm



* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

LEGEND

● = 4:30pm - 5:30pm

HCM 6th TWSC
1: Ensenada St & Smith Rd

05/21/2019

Intersection

Int Delay, s/veh 12.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	132	39	6	146	276	49
Future Vol, veh/h	132	39	6	146	276	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	425	175	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	65	50	74	70	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	159	60	12	197	394	72

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	219
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1350
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1350
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	23.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	1350	-
HCM Lane V/C Ratio	0.722	-	-	0.009	-
HCM Control Delay (s)	23.7	-	-	7.7	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	6.1	-	-	0	-

HCM 6th TWSC
2: Himalaya Rd & Smith Rd

05/21/2019

Intersection

Int Delay, s/veh 2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Vol, veh/h	174	10	2	131	73	13
Future Vol, veh/h	174	10	2	131	73	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	50	50	74	70	65
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	215	20	4	177	104	20

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	235
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1332
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1332
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	631	-	-	1332	-
HCM Lane V/C Ratio	0.197	-	-	0.003	-
HCM Control Delay (s)	12.1	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-