



February 20, 2024

Ms. Hanieh Houshmandi, PE, PTOE
Senior Traffic Engineer
City of San Carlos
600 Elm Street
San Carlos, CA 94070

All-Way Stop-Control Warrant Analysis for Arroyo Avenue/Chestnut Street

Dear Ms. Houshmandi;

As requested, W-Trans has prepared an all-way stop control (AWSC) warrant study for the intersection of Arroyo Avenue/Chestnut Street in the City of San Carlos. The AWSC warrant analysis was based on the criteria published in the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD).

Existing Conditions

The study intersection has three legs and stop controls on the terminating westbound Chestnut Street approach. According to the California Road System Functional Classification Map, Arroyo Avenue and Chestnut Street are both classified as local streets and primarily serve private residences as well as Burton Park. Arroyo Avenue is approximately 34 feet wide and generally runs northeast-southwest though at the intersection with Chestnut Street it runs more in a north-south alignment. Chestnut Street is 30 feet wide at the intersection with Arroyo Avenue and runs northwest-southeast. Arroyo Avenue has street parking on both sides and marked sharrows. Sidewalks are provided on both sides of Arroyo Avenue and on the west side of Chestnut Street along the Burton Park frontage; a marked crosswalk exists on the east leg of the intersection. The 25-mph *prima facie* speed limit for residential streets applies to both Arroyo Avenue and Chestnut Street. Arroyo Avenue additionally has a 15-mph posted speed limit when children are present, approximately between 125 feet north of Chestnut Street and 115 feet north of Woodland Avenue. Arroyo Avenue is a designated Class III bike route between Brittan Acres Elementary School and Downtown San Carlos.

Methodology

Guidance from the CA-MUTCD suggests that stop controls shall not be used to control speed; their primary purpose is to assign right-of-way at intersections. According to W. Martin Bretherton's paper titled, "Multi-way Stops – The Research Shows the MUTCD is Correct!," 69th Annual Meeting of the Institute of Transportation Engineers, 1999, there are high incidences of intentional violations resulting in decreased safety of pedestrians where stop signs are installed as a deterrent to speeding. Therefore, an engineering study is necessary to confirm whether the installation of stop controls at each intersection is appropriate.

Traffic Counts

Daily vehicle counts were collected on Arroyo Avenue southwest of Woodland Avenue for the week-long period starting on Wednesday, October 11, 2023, and ending on Tuesday, October 17, 2023, to establish typical travel patterns and levels of traffic demand at the study intersection. Additionally, intersection peak hour counts were collected during the a.m., midday, and p.m. peak periods (7:00 a.m. to 9:00 a.m., 2:00 p.m. to 4:00 p.m., and 4:00 p.m. to 6:00 p.m.), on Tuesday, November 14, 2023.

It is noted that most of the volume warrants are based on the highest eight hours of volumes for which daytime (7:00 a.m. to 7:00 p.m.) or 24-hour volumes are typically collected. However, the six hours selected typically represent the highest volumes, and therefore, additional traffic volumes would only be needed for intersections

where the six hours sampled were close to or surpassed the warrant thresholds. Copies of the traffic volumes collected are enclosed and the daily counts are summarized in Table 1.

Table 1 – Daily Traffic Count Summary for Arroyo Avenue (South of Woodland Avenue)

Date	NB	SB	Total
Mon, Oct 16, 2023	1,729	1,450	3,179
Tues, Oct 17, 2023	1,726	1,379	3,105
Wed, Oct 11, 2023	1,779	1,454	3,233
Thurs, Oct 12, 2023	1,800	1,511	3,311
Fri, Oct 13, 2023	1,804	1,529	3,333
<i>Weekday Average</i>	<i>1,768</i>	<i>1,465</i>	<i>3,232</i>
Sat, Oct 14, 2023	1,904	1,378	3,282
Sun, Oct 15, 2023	1,306	1,207	2,513
<i>Weekend Average</i>	<i>1,605</i>	<i>1,293</i>	<i>2,898</i>

Note: NB = Northbound, SB = Southbound

An average of 3,232 daily vehicles were measured traveling along Arroyo Avenue south of Woodland Avenue during the week, while an average of 2,898 vehicles were measured during the weekend.

Measured Speeds

Speed data gathered using ground mounted tubes between Wednesday, October 11, 2023, and Tuesday, October 17, 2023, suggest that, on average, 33.2 percent of northbound vehicles and 41.2 percent of southbound vehicles travel over the 25-mph speed limit. Additionally, the 85th percentile speeds were 28 mph for both northbound and southbound vehicles.

Two separate site visits were conducted. The first on Friday, January 12, 2024 and a subsequent visit on Thursday, February 15, 2024. Each visit was scheduled to overlap with the afternoon release times for the nearby Arroyo School and Central Middle School. During these visits, speed samples for approaching eastbound and westbound traveling vehicles were collected directly west and east of Arroyo Avenue/Chestnut Street, respectively. Of the forty vehicles on Arroyo Avenue for which a speed sample was taken over both visits, the 85th percentile speeds were 25 mph northbound and 23 mph southbound on January 12, and were 21 mph northbound and 23 mph southbound on February 15; both of which are nominally lower than the speeds measured by ground mounted tubes. The California Vehicle Code (CVC) Section 22358.4 states that a 15-mph *prima facie* limit should be applied in a residential district when approaching at a distance of less than 500 feet from or passing a school building or grounds of a school building. The 15-mph posted speed limit signs are located between approximately 125 feet north of Chestnut Street and 115 feet north of Woodland Avenue. Therefore, the location where the speeds were collected in the field did not fall in the applicable 15-mph *prima facie* speed limit zone.

The recorded speeds are not greater than 7 mph above the posted speed limit (32 mph) and as such do not satisfy the vehicle speed condition described in the *City of San Carlos Neighborhood Traffic Management Program* (NTMP), 2017.

All-Way Stop-Control Warrants

The stop sign warrant analysis was based on guidelines from the CA-MUTCD, which identifies five categories of criteria for determining if all-way stop controls should be considered, including the necessity for traffic signal control, various traffic volume levels on approaching streets, intersection collision records, a combination of these

warrants, and several optional warrants. The CA-MUTCD also includes the following four optional criteria for AWSC:

- A. The potential for left turn conflicts;
- B. The potential for vehicle/pedestrian conflicts where there is a high volume of pedestrian activity;
- C. Restricted sight distance to the extent that turns at the intersection are difficult to complete; and
- D. At the intersection of two residential neighborhood collector streets where AWSC would improve the overall operational characteristics of the intersection.

All of these warrants were evaluated for Arroyo Avenue/Chestnut Street, and the results are documented below. Copies of AWSC warrant worksheets are enclosed.

Collision History

The collision history for the study intersection was reviewed to determine any trends or patterns that may indicate a safety issue that could be prevented via the introduction of additional stop controls. In order for all-way stop-controls to be warranted to address a safety concern, at least five collisions of a type correctable through additional stop controls would need to have occurred within a 12-month period. These generally include right-angle collisions. Collision records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports were reviewed. The most current five-year period available is April 1, 2018, through March 31, 2023. There were no collisions reported at the study intersection during this period. Therefore, based on the collision history, the AWSC crash warrant is not satisfied.

Minimum Volumes

Traffic counts for the intersection were reviewed to determine if the volumes were adequate to meet the minimum vehicular volume warrant for additional stop controls. To meet the AWSC volume warrant, the total volume of vehicles entering from the major street (Arroyo Avenue) must average at least 300 vehicles per hour for any eight hours across a typical day. Additionally, an average of at least 200 combined vehicles, bicycles, and pedestrians must enter from the minor street (Chestnut Street) across the same eight hours. Also, the average delay of the minor street vehicles must be at least 30 seconds during the peak hour.

During the six hours of the counts obtained representing the a.m., midday and p.m. peak periods, an average of 255 vehicles per hour entered the intersection on Arroyo Avenue, less than the 300-vehicles-per-hour minimum. An average of 30 vehicles, bicycles, and pedestrians per hour were counted entering the intersection on Chestnut Street during the same six hours, short of the 200 combined vehicular, pedestrian, and bicycle volume minimum. Additionally, the calculated average delay of the minor street vehicles was about 11.2 seconds per vehicle, which is below the threshold of 30 seconds per vehicle.

One caveat of the minimum volume warrant is that the volumes and delay can be reduced to 70 percent of the above values if the 85th percentile speed on the major street is greater than 40 miles per hour. A speed limit is not posted on Arroyo Avenue, however the *prima facie* speed limit for this residential street is 25 miles per hour. Vehicle speeds were observed to be consistent with the *prima facie* speed limit of 25 mph and the 85th-percentile speed on the major street was 28 mph according to the counts taken. Therefore, the 70-percent reduction does not apply, though even if it did the minor street volumes and delay would be insufficient to meet it.

Combination Warrant

This warrant is applied when no single criterion is satisfied, but the collision and minimum volume warrants are met at the 80-percent level. This equates to four collisions in a 12-month period, 240 hourly vehicles on the major street across eight hours, and 160 hourly vehicles/bicycles/pedestrians on the minor street during the same eight hours. The minor street volumes and number of collisions at the study intersection were below the 80-percent level. Therefore, this warrant is not met.

Optional Warrants

The CA-MUTCD also provides four optional warrants that were evaluated. While these alone are not enough to justify installation of AWSC, they can be used in conjunction with engineering judgement to address special circumstances or minor shortfalls in satisfying other warrant criteria.

Left-turn Conflicts

No collisions involved a left-turn movement as there were no collisions reported in the study period. Additionally, conflicts between left-turning vehicles and other road users (such as pedestrians crossing and other vehicles) were not observed during the field visit. Therefore, this optional warrant is not considered met.

Vehicle/Pedestrian Conflicts

This warrant addresses intersections that have conflicts with vehicles and high pedestrian volumes. Four pedestrians were observed crossing Arroyo Avenue during the a.m. peak hour, eighteen were observed during the midday peak, and five were observed during the p.m. peak hour. During the site visits between 3:00 p.m. and 3:30 p.m., there were a combined 44 pedestrians, bicycles, and scooters observed crossing the street on January 12 and there were a combined 30 pedestrians, bicycles and scooters observed crossing the street on February 15.

Application of warrants published in the *NCHRP P562 – Pedestrian Crossing Treatment Workshop* indicates that crosswalk treatments could be warranted since the minimum threshold volume of 20 pedestrians crossing in one hour is met during the school peak hour, as observed during the site visits. Therefore, this optional warrant is considered to be met for the study intersection.

Visibility

At unsignalized intersections, a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Adequate time must be provided for the waiting driver to either cross, turn left, or turn right, without requiring the through traffic to radically alter their speed. Sight distance was evaluated based on criteria contained in the *Highway Design Manual* published by the California Department of Transportation (Caltrans). The recommended sight distance at intersections of public streets is based on stopping sight distances and the approach speed on the major street.

The optional warrant for installing AWSC should only be considered when permanent fixtures block sight lines, such as buildings and fences. Vehicles parked on the curb immediately adjacent to the intersection can also block sight lines between conflicting streams of traffic and between drivers and pedestrians; however, as parked vehicles are mobile and temporary, prohibiting parking may instead be a more appropriate countermeasure to increase sight lines. As section 18.15.130 of the *San Carlos Municipal Code* requires that there be adequate sight lines through private properties to observe oncoming vehicles at intersections, it is reasonable that sight lines through public right-of-way at intersections should also be preserved by prohibiting parking.

For the *prima facie* speed limit on Arroyo Avenue of 25 mph the recommended stopping sight distance from the Chestnut Street approach is 150 feet. A field review of existing sight distance indicates that sufficient sight lines are available although vehicles parked on the east side of Arroyo Avenue may restrict sight lines to the south. It is recommended that parking be prohibited on the east side of Arroyo Avenue for an additional distance of about 18 feet south of Chestnut Street past the existing 25-foot-long no parking zone. It is additionally recommended that parking be restricted for about 86 feet on the east side of Arroyo Avenue to the north of Chestnut Street. The Chestnut Street approach is the only approach that was evaluated for sight distance since it is the minor street approach. An illustration showing the sight lines and indicating the limits of parking removal and new curb extensions is enclosed.

Since adequate visibility is available or can be attained, this optional warrant is considered as not being met.

Residential Collector Streets

For this criterion to be met, the intersection must be of two residential neighborhood collector (through) streets of similar design where operation would be improved by all-way stop controls. Both Arroyo Avenue and Chestnut Street are classified as local residential streets according to the *California Road System (CRS) Maps*, Caltrans, 2022; therefore, this optional warrant is not met.

Summary of Findings

The optional warrant for vehicle/pedestrian conflicts is met for Arroyo Avenue/Chestnut Street due to 44 pedestrians crossing Arroyo Avenue in less than one hour. However, it appears that this high number of pedestrians crossing occurs only during the school peak hours. Therefore, it would be unnecessary to install all-way stop controls as they are not warranted under any other criteria. Since there are a large number of pedestrians crossing during the school peaks, it is recommended that a high-visibility school crosswalk and appropriate CA-MUTCD-compliant signage (W11-2, W16-9P, and W16-7P) be installed across Arroyo Avenue at the intersection with Chestnut Street.

Additionally, the prohibition of on-street parking adjacent to the future crosswalk would provide for improved driver sight lines and would also be consistent with State Law as described in the California Vehicle Code 22500 (n)(1)(A) which states that vehicles may not park within 20 feet from any marked or unmarked crosswalk.

Conclusions and Recommendations

- None of the AWSC warrants from the CA-MUTCD were met for Arroyo Avenue/Chestnut Street at this time, besides the optional warrant for vehicle/pedestrian conflicts.
- Prohibiting parking for an additional 18 feet on the east side of Arroyo Avenue south of Chestnut Street and prohibiting parking 86 feet north of Chestnut Street is recommended.
- A high number of pedestrians crossing Arroyo Avenue is expected only during the school peak hours, so the installation of all-way stop controls is not warranted. It is instead recommended that a high-visibility crosswalk and associated signage be installed on Arroyo Avenue at Chestnut Street.

Thank you for giving W-Trans the opportunity to provide these services. Please call if you have any questions.

Sincerely,

Valerie Haines, EIT
Assistant Engineer

Kenny Jeong, PE (Traffic)
Senior Engineer

Mark Spencer, PE (Traffic)
Senior Principal



MES/kj-vh/SCA901-11.L1

Enclosures: Speed and Volume Traffic Counts, AWSC Warrant Summary, and Sight Triangle Exhibit

Site Code: 36
36. Arroyo Ave W.O Woodland Ave

Start Time	11-Oct-23 Wed	EB	WB							Total
12:00 AM		1	0							1
01:00		1	0							1
02:00		0	0							0
03:00		2	0							2
04:00		3	0							3
05:00		11	2							13
06:00		24	10							34
07:00		74	49							123
08:00		171	122							293
09:00		113	73							186
10:00		114	72							186
11:00		101	85							186
12:00 PM		125	109							234
01:00		129	122							251
02:00		116	103							219
03:00		157	127							284
04:00		169	140							309
05:00		168	169							337
06:00		120	107							227
07:00		73	80							153
08:00		47	56							103
09:00		39	21							60
10:00		12	4							16
11:00		9	3							12
Total		1779	1454							3233
Percent		55.0%	45.0%							
AM Peak	-	08:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	171	122	-	-	-	-	-	-	293
PM Peak	-	16:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	169	169	-	-	-	-	-	-	337

Site Code: 36
36. Arroyo Ave W.O Woodland Ave

Start Time	12-Oct-23 Thu	EB	WB							Total
12:00 AM		0	1							1
01:00		0	0							0
02:00		0	1							1
03:00		1	0							1
04:00		3	0							3
05:00		11	1							12
06:00		25	12							37
07:00		82	51							133
08:00		177	131							308
09:00		97	64							161
10:00		108	63							171
11:00		117	96							213
12:00 PM		122	93							215
01:00		107	78							185
02:00		120	125							245
03:00		182	158							340
04:00		156	144							300
05:00		182	174							356
06:00		146	124							270
07:00		81	100							181
08:00		43	51							94
09:00		27	25							52
10:00		12	15							27
11:00		1	4							5
Total		1800	1511							3311
Percent		54.4%	45.6%							
AM Peak	-	08:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	177	131	-	-	-	-	-	-	308
PM Peak	-	15:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	182	174	-	-	-	-	-	-	356

Site Code: 36
36. Arroyo Ave W.O Woodland Ave

Start Time	13-Oct-23 Fri	EB	WB							Total
12:00 AM		4	0							4
01:00		0	2							2
02:00		0	1							1
03:00		1	0							1
04:00		2	0							2
05:00		9	1							10
06:00		20	7							27
07:00		62	57							119
08:00		185	122							307
09:00		106	82							188
10:00		113	74							187
11:00		118	98							216
12:00 PM		117	99							216
01:00		105	106							211
02:00		141	106							247
03:00		185	141							326
04:00		172	148							320
05:00		191	158							349
06:00		128	112							240
07:00		51	87							138
08:00		29	48							77
09:00		26	32							58
10:00		29	30							59
11:00		10	18							28
Total		1804	1529							3333
Percent		54.1%	45.9%							
AM Peak	-	08:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	185	122	-	-	-	-	-	-	307
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	191	158	-	-	-	-	-	-	349

Site Code: 36
36. Arroyo Ave W.O Woodland Ave

Start Time	14-Oct-23 Sat	EB	WB							Total
12:00 AM		4	1							5
01:00		0	4							4
02:00		1	1							2
03:00		0	0							0
04:00		2	0							2
05:00		2	1							3
06:00		13	7							20
07:00		47	19							66
08:00		88	48							136
09:00		105	80							185
10:00		179	77							256
11:00		203	135							338
12:00 PM		179	165							344
01:00		179	119							298
02:00		201	113							314
03:00		177	124							301
04:00		130	115							245
05:00		120	106							226
06:00		118	92							210
07:00		69	72							141
08:00		30	39							69
09:00		27	26							53
10:00		21	22							43
11:00		9	12							21
Total		1904	1378							3282
Percent		58.0%	42.0%							
AM Peak	-	11:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	203	135	-	-	-	-	-	-	338
PM Peak	-	14:00	12:00	-	-	-	-	-	-	12:00
Vol.	-	201	165	-	-	-	-	-	-	344

Site Code: 36
36. Arroyo Ave W.O Woodland Ave

Start Time	15-Oct-23 Sun	EB	WB							Total
12:00 AM		6	9							15
01:00		6	4							10
02:00		3	2							5
03:00		1	1							2
04:00		2	0							2
05:00		2	3							5
06:00		7	7							14
07:00		30	22							52
08:00		57	40							97
09:00		102	75							177
10:00		128	83							211
11:00		116	100							216
12:00 PM		109	121							230
01:00		121	102							223
02:00		111	114							225
03:00		114	109							223
04:00		89	110							199
05:00		115	113							228
06:00		75	88							163
07:00		61	49							110
08:00		32	24							56
09:00		8	14							22
10:00		8	12							20
11:00		3	5							8
Total		1306	1207							2513
Percent		52.0%	48.0%							
AM Peak	-	10:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	128	100	-	-	-	-	-	-	216
PM Peak	-	13:00	12:00	-	-	-	-	-	-	12:00
Vol.	-	121	121	-	-	-	-	-	-	230

Site Code: 36
36. Arroyo Ave W.O Woodland Ave

Start Time	16-Oct-23 Mon	EB	WB							Total
12:00 AM		3	2							5
01:00		0	0							0
02:00		0	0							0
03:00		1	0							1
04:00		5	1							6
05:00		9	3							12
06:00		21	10							31
07:00		72	44							116
08:00		170	132							302
09:00		100	63							163
10:00		104	67							171
11:00		101	57							158
12:00 PM		113	88							201
01:00		120	100							220
02:00		154	131							285
03:00		183	142							325
04:00		167	162							329
05:00		155	185							340
06:00		119	122							241
07:00		64	60							124
08:00		32	51							83
09:00		19	15							34
10:00		14	11							25
11:00		3	4							7
Total		1729	1450							3179
Percent		54.4%	45.6%							
AM Peak	-	08:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	170	132	-	-	-	-	-	-	302
PM Peak	-	15:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	183	185	-	-	-	-	-	-	340

Site Code: 36
36. Arroyo Ave W.O Woodland Ave

Start Time	17-Oct-23 Tue	EB	WB							Total
12:00 AM		0	1							1
01:00		2	0							2
02:00		0	0							0
03:00		0	0							0
04:00		1	0							1
05:00		15	2							17
06:00		26	8							34
07:00		70	52							122
08:00		186	124							310
09:00		92	56							148
10:00		96	64							160
11:00		96	64							160
12:00 PM		107	82							189
01:00		86	83							169
02:00		142	113							255
03:00		147	133							280
04:00		154	149							303
05:00		209	179							388
06:00		124	122							246
07:00		78	69							147
08:00		57	50							107
09:00		23	17							40
10:00		11	9							20
11:00		4	2							6
Total		1726	1379							3105
Percent		55.6%	44.4%							
AM Peak	-	08:00	08:00	-	-	-	-	-	-	08:00
Vol.	-	186	124	-	-	-	-	-	-	310
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00
Vol.	-	209	179	-	-	-	-	-	-	388
Grand Total		12048	9908							21956
Percent		54.9%	45.1%							
ADT		ADT 3,137	AADT 3,137							

Day: Tuesday
Date: 11/14/2023

[illegible]

California Manual on Uniform Traffic Control Devices (CaMUTCD)
All-Way Stop Control (AWSC) Warrant Worksheet



Intersection #:	1	Calc:	VRH
Major Street:	Melendy Drive	Date:	1/18/2024
Minor Street:	Rockridge Road	Check:	KBJ
Existing Control:	Two-Way Stop	Date:	1/18/2024
Volume Count Date:	11/14/2023		
Speed Count Date:	10/11/2023	At least one warrant satisfied?	No
Field Visit Date:	1/12/2024	Optional Warrants Satisfied?	1

WARRANT A - Interim Measure	Satisfied? No
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CaMUTCD Language

Condition A: Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.

Are traffic control signals justified at this location? **No**

WARRANT B - Crash History	Satisfied? No
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CaMUTCD Language

Condition B: Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.

	Crashes	Minimum
Total in a 12-month period	0	-
Total in a 12-month period susceptible to correction by AWSC	0	5

WARRANT C - Eight Hour Volume	C.1+C.2 or C.3 Satisfied? No
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CaMUTCD Language

Condition C.1: The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and

Condition C.2: The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour.

Hour	C.1 Volume	C.2 Volume
7:00 - 8:00	128	9
8:00 - 9:00	247	39
14:00 - 15:00	236	33
15:00 - 16:00	274	29
16:00 - 17:00	327	32
17:00 - 18:00	315	35
16:30 - 17:30	347	35
-	N/A	N/A

	Average Volume	Minimum	Satisfied?
C.1	255	300	No
C.2	30	200	No

	Peak Hour Delay	Minimum	Satisfied?
C.2	11	30	No

Peak Hour
16:30 - 17:30

California Manual on Uniform Traffic Control Devices (CaMUTCD)
All-Way Stop Control (AWSC) Warrant Worksheet



Intersection #: 1
Major Street: Melendy Drive
Minor Street: Rockridge Road

CaMUTCD Language

Condition C.3: If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.

	Value	Minimum	Satisfied?
C.1. Major Street Entering Vehicles (Both Approaches)	255	210	Yes
C.2. Minor Street Entering Vehicles, Pedestrians, and Bicycles (Both Approaches)	30	140	No
C.2. Minor Street Peak Hour Vehicle Delay (Seconds)	11	21	No
C.3. Major Street 85th-percentile Speed	30	41	No

WARRANT D - Combination of Above

Satisfied? No

CaMUTCD Language

Condition D: Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

	Value	Minimum	Satisfied?
B. Crashes in 12-month period susceptible to correction by AWSC	0	4	No
C.1. Major Street Entering Vehicles (Both Approaches)	255	240	Yes
C.2. Minor Street Entering Vehicles, Pedestrians, and Bicycles (Both Approaches)	30	160	No
C.2. Minor Street Peak Hour Vehicular Delay (Seconds)	11	24	No

OPTIONAL WARRANTS

1 Optional Warrant Satisfied

- | | | | |
|---|--|------------|-----|
| A | The need to control left-turn conflicts | Satisfied? | No |
| B | The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes | Satisfied? | Yes |
| C | Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop | Satisfied? | No |
| D | An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection | Satisfied? | No |

CENTRAL MIDDLE SCHOOL

