August 7, 2023

Mr. Eric Sepanek
Gold Standard Property, LLC
9943 East Bell Road
Scottsdale, AZ 85260

RE: TRAFFIC STUDY – *3RD SUBMITTAL* FOR PROPOSED DEVELOPMENT ON LOT 1B ON HAYDEN ROAD AT 84TH STREET – SCOTTSDALE (CASE #1-DR-2023/KEY CODE 6L395)

Dear Mr. Sepanek:

Thank you for retaining CivTech to provide this traffic study for Gold Standard Property's proposed project located on the east side of Hayden Road just north of 84th Street in Scottsdale, Arizona (the "Project"). The project vicinity is shown in **Figure 1**.

The proposed Project will develop a single Maricopa County Assessor parcel "Lot 1B" (APN 215-52-107) of approximately 45,712 square feet (sf) with a 12,867-sf building consisting of a cigar bar, a retail area, a gallery, a recording studio, and general office space. A site plan has been provided as

FIGURE 1 – VICINITY MAP

Attachment A, which also shows the site layout and orientation of the building on the site. This statement will compare the trips expected from the previously-proposed mixed-use development, which was studied by CivTech in 2019, and the newly proposed development.

This version of the traffic study represents a 3rd submittal of an original version and a 2nd Submittal sealed by CivTech on December 22, 2022 and June 21, 2023, respectively. In the original version, CivTech provided a Traffic Signal Warrant Analysis for the intersection of 84th Street and Hayden Road; it remains herein as it was presented then. CivTech understood that this warrant analysis was stipulated for either or both of remaining two parcels for the Core Center, which include the subject development on Lot 1B and a separate proposed development located to the immediate southwest of the proposed project on Lot 1A on Maricopa County Assessor parcel APN 215-52-106. While the Lot 1A project is not a part of this project, it was a part of the previously-approved development at this location, and is included in the trip generation and comparison for consistency, albeit separately. *The reader should be aware that CivTech prepared a traffic study for the Lot 1A project that was sealed for submission on February 3, 2023. CivTech now understands that the developer of Lot 1A has assumed responsibility for the traffic signal at the intersection of 84th Street and Hayden Road. Therefore, CivTech revised the original version of this study for the purpose of acknowledging that new revelation and has prepared this 3rd Submittal to respond to three additional City comments, two of which are related, in areas that will be identified in the text.*

The requirements for Transportation Impact Studies are detailed in Section 5-1 of the City of Scottsdale's *Design Standards & Policies Manual, 2018.* Based on the level of trip generation expected from the proposed development, a Category 1 Transportation Impact and Mitigation Analysis (TIMA) is warranted.

EXISTING CONDITIONS

LAND USE

The project site is currently vacant land previously used as an auto dealership that has since been razed. The site has one (1) right-in-right-out driveway just north of 84th Street that will be shared by the proposed development and another project being planned for the vacant site ("Lot 1A") to the (south)west.

ROADWAY NETWORK

Hayden Road is a north-south four-lane arterial street with two (2) lanes of travel in each direction and a raised median within the vicinity of the Project site. Hayden Road begins to the north at Frank Lloyd Wright Boulevard, becomes McClintock Drive at McKellips Road where it enters the City of Tempe to the south, and ends in the City of Chandler at State Route 202L (SR-202L), an Arizona Department of Transportation (ADOT) facility. There are curb, gutter, and sidewalk facilities on both sides of Hayden Road and a posted speed limit of 45 miles per hour (MPH).

84th Street is a north-south two-lane collector street with one (1) lane of travel in each direction. This short segment of 84th Street begins to the north, approximately ¼ mile north of Hayden Road

and terminates at Hayden Road. There are curb, gutter, and sidewalk facilities on both sides of 84th Street and no posted speed limit.

Please note that **Hayden Road** and **84th Street** are both roadways that are generally oriented north-south through the City of Scottsdale. In the vicinity of the project, Hayden Road is oriented northeast-southwest around Scottsdale Airpark, while 84th Street is oriented northwest-southeast across Hayden Road.

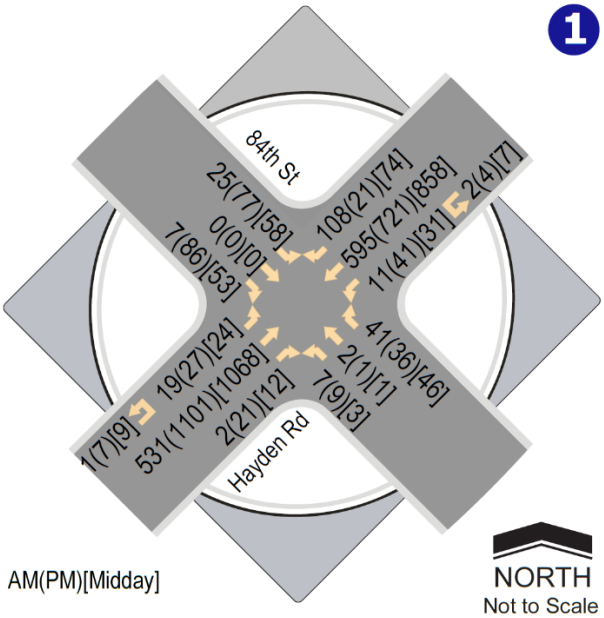
The intersection of **Hayden Road** and **84th Street/SW Access** is two-way stop controlled with stop control on the northwestbound (main Core Center driveway/SW Lot 1B Access) and southeastbound (84th Street) approaches. The southeast approach is the private main access into the existing Core Scottsdale apartments that will also serve Lots 1B and 1A under the revised, cohesive site plan shown in **Attachment A**. The northeastbound Hayden Road approach consists of one (1) exclusive left turn lane, two (2) through lanes, and one (1) right-turn lane. The southwestbound Hayden Road approach consists of one (1) exclusive left turn lane, one (1) through lane, and one (1) shared through/right-turn lane. The northwestbound SW Access approach consists of one (1) exclusive left turn lane and one (1) shared through/right-turn lane. The southeastbound 84th Street approach consists of one (1) shared left-turn/through/right-turn lane. There are curb, gutter, and sidewalk facilities on all corners and no crosswalks.

ADJACENT VOLUMES

CivTech engaged All Traffic Data Services to record 24-hour turning movement volumes at the intersection of Hayden Road and 84th Street; these counts were conducted on Tuesday, November 15, 2022. The existing 2022 volumes *(as recorded)* are shown in **Figure 2**. Traffic count data sheets are included as **Attachment B.**

In addition, due to ongoing construction of a new roundabout at the intersection of Hayden Road and Raintree Drive affecting through traffic volumes on Hayden Road, the City directed CivTech to utilize historic traffic counts for the through volumes on Hayden Road, adjusted to 2022. CivTech previously engaged Field Data Services of Arizona, Inc. to record 24-hour turning movement volumes at intersection; these counts were conducted on Thursday, April 25, 2019.

FIGURE 2 – Existing Peak Hour Volumes



84th Street and Hayden Road

CivTech reviewed and compared the two sets of counts and discovered only minor differences between the through volumes on Hayden Road recorded in 2019 and those recorded recently. These are summarized in **Table 1**, which compares the AM and PM peak hour volumes during the current

TABLE 1 – COMPARISON OF PEAK HOUR THROUGH VOLUMES ON HAYDEN ROAD, 2019 AND 2022

Year	AM Peak Hour Starts	Eastbound AM Volume	Westbound AM Volume	PM Peak Hour Starts	Eastbound PM Volume	Westbound PM Volume
2019	7:45	597	594	4:15	1,125	686
2022	*7:45**	*504*	*609*	*4:15**	*1,121*	*650*
2022	8:00	531	595	4:00	1,101	721
2022 Adjusted		634	630		1,194	728

* 2022 7:45 AM and 4:15 PM peak hours provided for direct comparison of corresponding hours in 2019 and 2022.

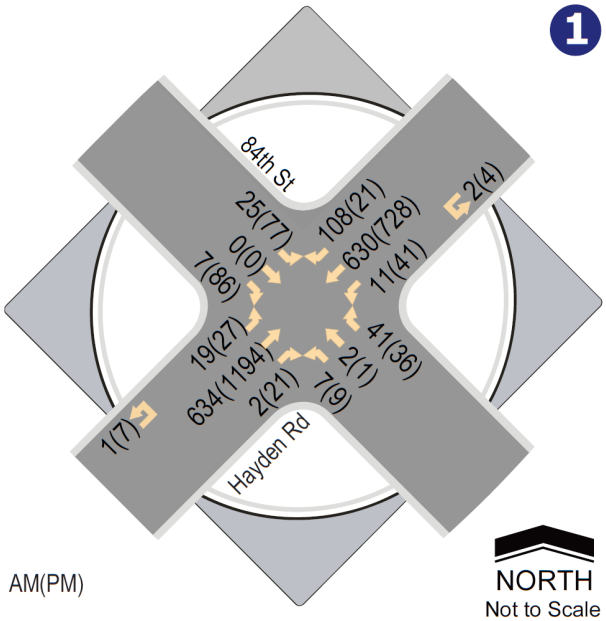
peak hours (8:00 AM-9:00 AM and 4:00 PM-5:00 PM) to the peak hour volumes recorded from 7:45 AM-8:45 AM and from 4:15 to 5:15 PM in 2019 and then also to the volumes recently recorded for the corresponding time periods. In both cases, there are few substantive differences, suggesting to CivTech that volumes have returned approximately to pre-Covid levels and that the construction has not deterred many commuters from this route and that these commuters find it the most convenient route to and from their places of employment, despite the construction. The most substantive difference is during the AM peak hour, where 93 more eastbound vehicles were recorded in 2019 during the corresponding hour and 66 more vehicles were recorded during the two peak hours. Comparing the PM peak hours, 24 more eastbound vehicles were recorded in 2019 than in 2022, although there were 35 more westbound vehicles recorded in 2022 than 2019. The through movements on Hayden Road from 2019 were projected to 2022 levels by applying a 2% annual growth rate for three years; these can be seen in the last row of the table. These resulting 2022 through volumes on Hayden Road then replaced the existing 2022 traffic volumes. The adjusted 2022 AM and PM peak hour volumes can be seen in **Figure 3**.

CRASH HISTORY

The most recent three (3) years-worth of historical crash data readily available from ADOT's crash history database for the intersection of Hayden Road and 84th Street was reviewed as part of this analysis. In total, there were 19 reported incidents at this intersection over the considered three-year period. A summary of what was revealed by this data is presented in **Table 2** at the top of the next page. Crash analysis worksheets are included as **Attachment C.**

Of all the incidents reviewed, 6 resulted in 10 non-fatal injuries. The highest percentage of incidents were left turn collisions. No crashes of types "susceptible to correction" by the installation of a traffic control signal (typically

FIGURE 3 – Adjusted 2022 Peak Hour Volumes



84th Street and Hayden Road

TABLE 2 – CRASH DATA SUMMARY FOR 2019 THRU 2021

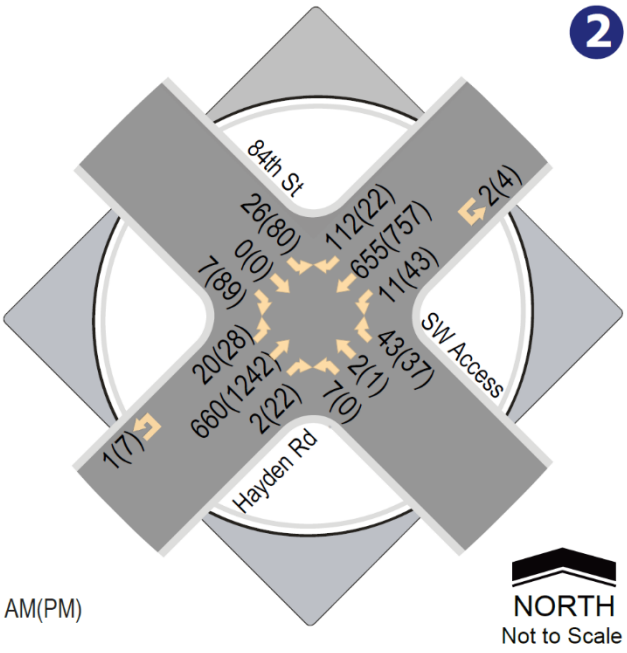
General Location	3-Year Total	Year of Occurrence			Incident Severity			Incident Type					
		2021	2020	2019	Non-Injury	Injury (# Injuries)	Fatality	Single Vehicle	Angle	Left Turn	Rear End	Head On	Side Swipe
Hayden Rd and 84th St	19	7	5	7	13	6(10)	0	1	3	7	2	0	5

considered angle and left turn crashes) were reported in numbers (5 incidents in a 12-month period) as to allow a traffic signal to be considered at the intersection based on crash experience.

FUTURE BACKGROUND TRAFFIC

In order to estimate background traffic volumes, a growth rate was needed to estimate growth in ambient traffic, or traffic in the surrounding area not including new trips estimated to be generated by the site. CivTech applied the same growth rate of 2% per year used in prior studies (an annual growth factor of 1.02), which was calculated using City of Scottsdale's Average Daily Traffic Volumes on Northsight Boulevard southeast of 87th Street. CivTech applied a factor of 1.04 (= 1.02^2) to each of the adjusted volumes in **Figure 3** to project the opening year—now expected to be 2024—background traffic volumes presented in **Figure 4**.

FIGURE 4 – 2024 Background Volumes



84th Street/SW Access and Hayden Road

PROPOSED DEVELOPMENT

LAND USE AND LOCATION

The Project consists of the following land uses and approximate floor areas (ksf or 1,000 sf): bar and retail (1.312 ksf), gallery (3.161 ksf), recording studio (1.245 ksf), and office building (6.780 ksf). The site is a single parcel of approximately 1.05 acres, located on the east side of Hayden Road just north of 84th Street.

SITE ACCESS

Two City comments required a connection from Lot 1A and the main Core Center access to Lot 1B and a "cohesive site plan" such that both Lots 1B and 1A would have a direct access to the existing main access (the "Southwest Access" for Lot 1B and the expected traffic signal there) and to the secondary "Northeast Access" for Lot 1B, an existing right-in/right-out driveway on Hayden Road.

TRIP GENERATION AND COMPARISON

The potential trip generation for the project was estimated using the latest (11th) edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (TripGen11) and the 3rd edition of ITE's *Trip Generation Handbook*. TripGen11 contains data collected by various transportation professionals for a wide range of different land uses. The data are summarized in the report and average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized land use. The report provides information for daily and peak hour trips. TripGen11 provides trip generation data for offices and bars. No information is available for a recording studio, which is expected to be an amenity for the offices (as a place to record podcasts) and, thus, will be combined with the offices for the purpose of generating trips. The retail shop is intended to be an amenity for cigar smokers, where they can purchase more cigars; thus, the retail and bar floor areas are combined. The data publish for a museum is based on a single observation and provides no daily rate; therefore, CivTech applied to the PM peak hour trips generated by the museum the same ratio of daily to PM peak hour trips as that of a library (72.05 ÷ 8.16, or 8.83, which CivTech rounded to 9).

Table 3 is a comparison of the weekday daily and peak hour trip generation potentials of previously approved land use to those of the currently proposed land use.

As summarized in **Table 3**, the previously approved multi-use development plan had the potential to generate up to 4,406 weekday daily trips, with 183 trips generated during the AM peak hour and 426 trips generated during the PM peak hour. The currently proposed mixed-use office and bar development on Lot 1B is estimated to generate up to 246 weekday daily trips, with 20 trips generated during the AM peak hour and 70 trips generated during the PM peak hour. The proposed mixed-use office and bar development has the potential to generate 4,166 *fewer* weekday daily trips, with 163

TABLE 3 – WEEKDAY TRIP GENERATION COMPARISON

Land Use	ITE Code	Size	Units	Trips Generated						
				Daily Total	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Previously Approved (2019) Development Plan										
General Office	710	124	ksf	1,308	123	20	143	22	118	140
Shopping Center	820	35	ksf	1,322	20	13	33	64	69	133
Quality Restaurant	931	35	ksf	2,934	22	4	26	183	90	273
			Total Trips	5,564	165	37	202	269	277	546
			Reductions	(1,158)	(15)	(4)	(19)	(70)	(50)	(110)
			Total External Vehicle Trips	**4,406**	**150**	**33**	**183**	**199**	**227**	**426**
Currently Proposed (2022) CORE Center Lot 1B Development Plan										
Bar	975	1.681	ksf	120	1	0	1	13	6	19
General Office	710	8.025	ksf	130	17	2	19	3	17	20
Museum	580	3.161	ksf	6	1	0	1	0	1	1
			Total Trips	256	19	2	21	16	24	40
			Internal Capture Reduction	6	0	0	0	1	0	1
			Alternate Mode Reduction	10	1	0	1	1	1	2
			Total External Vehicle Trips	***240***	***18***	***2***	***20***	***14***	***23***	***37***
			Trip Generation Increase/(Reduction)	***(4,166)***	***(132)***	***(31)***	***(163)***	***(185)***	***(204)***	***(389)***

fewer trips generated during the AM peak hour and 389 *fewer* trips generated during the PM peak hour than that of the previously approved development plan from 2019.

As mentioned previously, there is a separate proposed development located at "Lot 1A" (APN 215-52-106), immediately adjacent to the Project site, to the southwest. The trip generation from this development was included in the original approved overall development and is included in the comparison for consistency. **Table 4** is a comparison of the weekday daily and peak hour trip generation potentials of the previously approved land use to those of the two currently proposed developments.

TABLE 4 – WEEKDAY TRIP GENERATION COMPARISON

Land Use	ITE Code	Size	Units	Trips Generated						
				Daily	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out	Total
Previously Approved (2019) Development Plan (from Table 3)										
Total External Vehicle Trips				*4,406*	*150*	*33*	*183*	*199*	*227*	*426*
Currently Proposed (2022) CORE Center Lot 1B Development Plan (from Table 3)										
Total External Vehicle Trips				*240*	*18*	*2*	*20*	*14*	*23*	*37*
Currently Proposed (2022) CORE Center Lot 1A Development Plan										
General Office	710	25.692	KSF	356	46	6	52	9	45	54
Strip Retail Plaza	822	27.066	KSF	1,372	38	26	64	79	79	158
Hotel	310	140	Rooms	1,094	35	28	63	39	37	76
Total Trips				2,822	119	60	179	127	161	288
Internal Capture Reduction				(192)	(3)	(2)	(5)	(16)	(16)	(32)
Alternate Mode Reduction				(112)	(5)	(3)	(8)	(5)	(6)	(11)
Total External Vehicle Trips				*2,518*	*111*	*55*	*166*	*106*	*139*	*245*
Total Proposed 2022 Trips (				*2,758*	*129*	*57*	*186*	*120*	*162*	*282*
Trip Generation Increase/(Reduction)				*(1,648)*	*(21)*	*24*	*3*	*(79)*	*(65)*	*(144)*

As summarized in **Table 4**, the *two* currently proposed mixed-use developments (on Lots 1B *and* 1A) are estimated to generate a total of up to 2,758 weekday daily trips, with 120 trips generated during the AM peak hour and 282 trips generated during the PM peak hour. The proposed two mixed-use developments have the potential to generate 1,648 *fewer* weekday daily trips, with 3 *additional* trips generated during the AM peak hour and 144 *fewer* trips generated during the PM peak hour than that of the previously approved development plan from 2019.

TRIP DISTRIBUTION AND ASSIGNMENT

In prior versions of this study, a single site access (now designated the NE Access for Lot 1B) would have allowed only right-in/right-out movements only. Under the revised, cohesive site plan of **Attachment A**, Lot 1B patrons will have access to the main Core Center access (the SW Access for use by Lot 1B patrons) and the future traffic signal there. Patrons of Lot 1B facilities arriving from the north and departing to the south will now be able to use the signalized SW Access and not need to make U-turns anywhere on Hayden Road. The resulting trip distribution percentages for the study area are shown in **Table 5**.

SITE TRAFFIC

By applying the percentages in **Table 5** to the proposed entering and exiting trips in **Table 4**, the AM and PM peak hour and weekday site volumes into and out from the two site driveways can be estimated. The results are illustrated in **Figure 6**. *Please note that, since the site plan is now more cohesive and Lot 1B patrons will have direct access to the southwest/main acccess, there is no longer the need for existing patrons to depart to the north and make U-turns at the Hayden/Northsight roundabout to travel to the south as had been shown in prior versions.* Adding the site trips in **Figure 6** to the 2024 background trips in **Figure 5** yields the total peak hour volumes, which are illustrated in **Figure 6**.

TABLE 5 – SITE TRIP DISTRIBUTION

Direction (To/From)	Percentage
North on Hayden Road (to Northsight Boulevard and beyond)	70%
West on Frank Lloyd Wright Boulevard (west of Northsight Boulevard)	*20%*
East on Frank Lloyd Wright Boulevard (east of Hayden Road)	*35%*
South on Northsight Boulevard (south of Hayden Road)	*15%*
South on Hayden Road (after U-turn at Roundabout)	30%
South on Hayden Road (southwest of 83rd Place)	*20%*
South on 83rd Place (southeast of Hayden Road)	*10%*
Total	**100%**

FIGURE 5 – SITE GENERATED VOLUMES

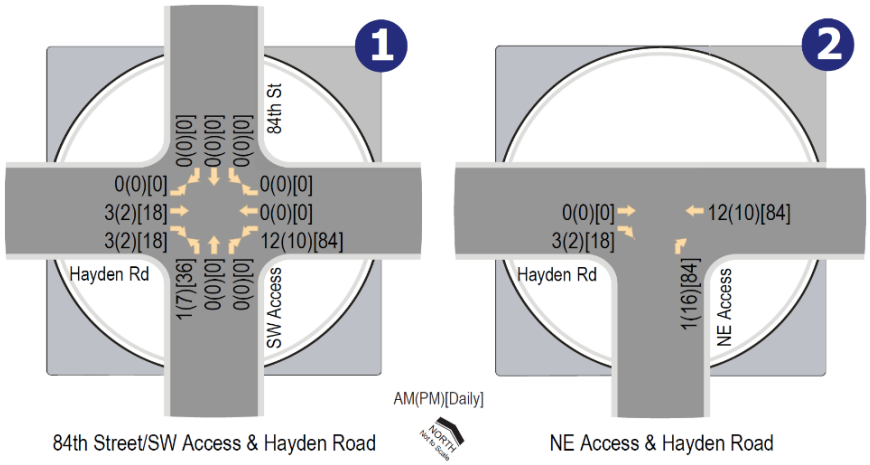
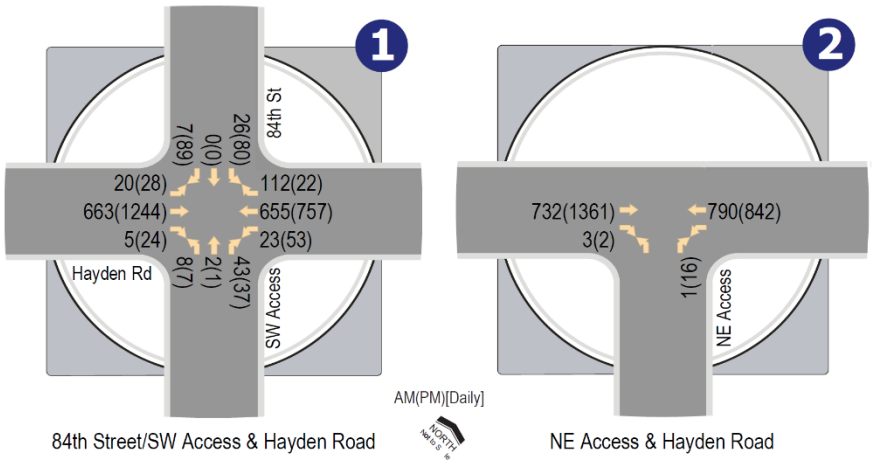


FIGURE 6 – TOTAL 2024 AM(PM) PEAK HOUR VOLUMES



TRAFFIC SIGNAL WARRANT ANALYSIS

As noted, the City reviewed the 2nd (June 2023) version of this statement and made three comments, the first and third of which are addressed above. This section has been revised in response to the second comment. Since a new cohesive site plan has been developed, a review of **Attachment A** now confirms that, whereas previously there was to be no convenient access from Lot 1B to the existing main/SW Access and the potential future traffic signal the intersection of **84th Street and Hayden Road/SW Access**, there will now be a direct link from Lot 1B. Since there was an existing zoning stipulation from the City that tasked the developer of either Lot 1B or Lot 1A to conduct a traffic signal warrant analysis for the intersection, the signal warrant analysis below was provided in prior versions. Subsequently, the City reviewer has acknowledged something CivTech noted in its 2nd version of this study: that the developer of "Lot 1A property has taken responsibility for the construction of the traffic signal." This, however, does not relieve the developer of Lot 1B from providing this analysis. In this analysis, CivTech utilized projected existing, background, and total traffic volumes for the intersection. These volumes include existing volumes grown to account for regional growth added to the volumes produced by the proposed development. The signal warrant analysis worksheets can be found in **Attachment D**.

The traffic signal warrant analysis was performed in accordance with standard traffic signal warranting criteria found in the *Manual on Uniform Traffic Control Devices, 2009 Edition* (MUTCD). The MUTCD describes eight conditions under which a traffic signal might be warranted, designated Warrants 1 through 8, and indicates that, "The investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the [eight] traffic signal warrants and other factors related to existing operation and safety at the study location" while cautioning that, "The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal." The MUTCD suggests that traffic control signals should not be installed unless one or more of the signal warrants are met. However, the satisfaction of a warrant or warrants is not in itself justification for a signal. Every situation is unique and warrant guidelines must be supplemented by the effects of specific site conditions and the application of good engineering judgment. Installation of a traffic signal should improve the overall safety and/or operation of an intersection and should be considered only when deemed necessary by careful traffic analysis and after less restrictive solutions have been attempted. It was this criterion to which the anticipated approach traffic volumes at the one (1) study intersection were compared to determine whether or not a traffic signal is currently warranted.

Warrant 1: Eight-Hour Vehicular Volume

The Eight-Hour Vehicular Volume Warrant is intended for locations where either of the following two conditions, or a combination of both, exist for each of any 8 hours of an average day and is, thus, the principal reason to consider the installation of a traffic signal: a large volume of intersecting traffic or traffic volumes so heavy on the major street that entering vehicles suffer extensive delay or conflict.

Condition A: Minimum Vehicular Volume

Condition A, the Minimum Vehicular Volume, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The

need for a traffic control signal shall be considered if the vehicles per hour given in both of the 100 percent columns of Condition A in **Table 4C-1** of the MUTCD (reproduced below) occur on the major street and the higher-volume minor-street approaches, respectively, to the intersection for each of any 8 hours of an average day.

Condition B: Interruption of Continuous Traffic

Condition B, the Interruption of Continuous Traffic, is intended for application at locations where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. The need for a traffic control signal shall be considered if the vehicles per hour given in both of the 100 percent columns of Condition B in **Table 4C-1** of the MUTCD occur on the major-street and the higher-volume minor-street approaches, respectively, to the intersection for each of any 8 hours of an average day.

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

[a] Basic minimum hourly volume.
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

Combination of Conditions: A and B

The combination of Conditions A and B is intended for application at locations where Condition A is not satisfied and Condition B is not satisfied and should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. The need for a traffic control signal shall be considered if the vehicles per hour given in both of the 80 percent columns of Conditions A and Condition B in **Table 4C-1** of the MUTCD occur on the major-street and the higher-volume minor-street approaches, respectively, to the intersection for each of any 8 hours of an average day.

Warrant 2: Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor street approach (one direction only) all fall above the applicable curve in **Figure 4C-2** (this and all other referenced figures are attached) for the existing combination of approach lanes.

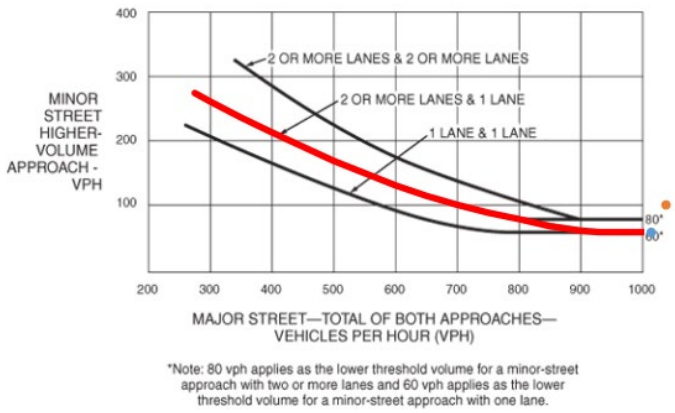
Warrant 2: Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor street approach (one direction only) all fall above the applicable curve in **Figure 4C-2** (this and all other referenced figures are attached) for the existing combination of approach lanes.

Since the posted speed limit on Hayden Road exceeds 40 mph, **Figure 4C-2** was used.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Warrant 3: Peak-Hour Vehicular Volume

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. It 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.

The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:

1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and

2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and

3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

If the posted speed limit on the major street exceeds 40 mph, Figure 4C-4 may be used in place of Figure 4C-3 to satisfy the criteria in the second category of the Standard. Since the posted speed limit on Hayden Road is 45 mph, Figure 4C-4 was used for this analysis.

*Please note that the values for Warrants 2 and 3 shown on **Attachment D** were automatically calculated using formulae, not determined by the plotting method described in the MUTCD. These formulae approximate the curves in the MUTCD; they were developed by others and found in the Indiana Supplement to the year 2000 MUTCD.*

Table 5 summarizes the volume-based warrant analysis results for the existing conditions.

TABLE 5 – TRAFFIC SIGNAL ANALYSIS SUMMARY WARRANTS 1 – 3

Intersection	Warrant 1				Warrant 2	Warrant 3
	Condition A	Condition B	Combination of A & B	Overall		
Existing Scenario						
84th Street and Hayden Road	No	Yes	No	**Yes**	**Yes**	**Yes**
Opening Year 2023 – No Build Scenario						
84th Street and Hayden Road	No	Yes	No	**Yes**	**Yes**	**Yes**
Opening Year 2023 – Build Scenario						
84th Street and Hayden Road	No	Yes	No	**Yes**	**Yes**	**Yes**

The results of the volume-based traffic signal warrants analysis indicate that traffic volumes on 84th Street and Hayden Road already exceed the criteria for Warrants 1, 2 and 3 under existing conditions, that is, without the project proposed for either Lot 1B or Lot 1A. Worksheets used for the signal warrant analysis are included in **Attachment D**. A traffic signal is warranted and, as indicated in a

review comment on a previous version of this study, the City understands that the developer of Lot 1A property has taken responsibility for the construction of the traffic signal.

CONCLUSIONS

The following can be concluded from the above analysis:

- The proposed multi-use development on Lot 1B is estimated to generate 246 weekday daily trips, with 20 trips generated during the AM peak hour and 70 trips generated during the PM peak hour. This is 4,166 *fewer* vehicular trips on a weekday—almost 95 percent *fewer* trips than could have been generated by previously approved multi-use development—with 163 and 389 *fewer* trips generated during the AM and PM peak hours, respectively.

- The two currently proposed developments (on Lots 1B *and* 1A) are estimated to generate 2,758 weekday daily trips, with 120 trips generated during the AM peak hour and 282 trips generated during the PM peak hour. This is 1,648 *fewer* vehicular trips on a weekday—33 percent *fewer* trips than could be generated by previously approved multi-use development—with 3 *additional* trips generated during the AM peak hour and 144 *fewer* trips generated during the PM peak hour.

- The results of the volume-based traffic signal warrant analysis indicate that traffic volumes of 84th Street and Hayden Road already exceed the criteria for Warrants 1, 2 and 3 without the project, that is, without the project proposed for either Lot 1B or Lot 1A. A traffic signal is warranted and, as indicated in a review comment on a previous version of this study, the City understands that the developer of Lot 1A property has taken responsibility for the construction of the traffic signal.

Thank you for allowing CivTech to provide engineering services for this project. Should there be any questions please contact me at (480) 659-4250.

Sincerely,

CivTech

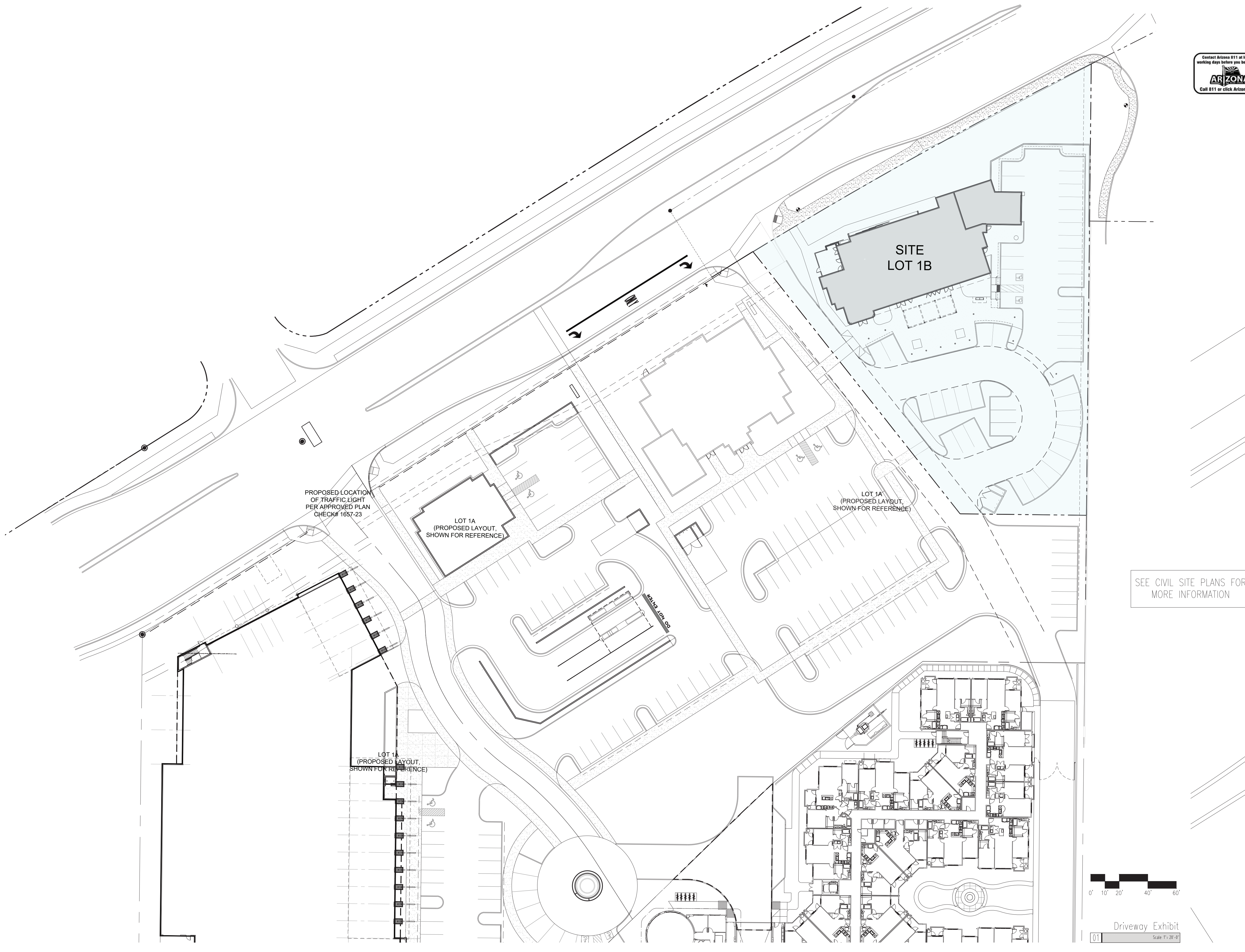
Joseph Spadafino, P.E., PTOE, PTP
Senior Project Manager/Traffic Engineer

Attachments (4)

A. Site Plan
B. Existing Traffic Counts
C. Crash Analysis Worksheets
D. Signal Warrant Analysis

ATTACHMENT A

SITE PLAN



PAGE SIZE: 36x48

PLAN REVIEW:
-

REVISIONS:

Scottsdale Bullion and Coin

15465 N Hayden Rd, Scottsdale, AZ 85260

DRB
SUBMITTAL
NOT FOR
CONSTRUCTION

STUDIO KZ
7127 E Sixth Avenue, Suite A
Scottsdale, AZ 85251
480-246-9332
www.studiokz.com

PROJECT: 21A07
DATE: 07/28/2023
DRAWN BY: SKZ

DRIVEWAY EXHIBIT

A1.3

ARCH PAGE X OF X

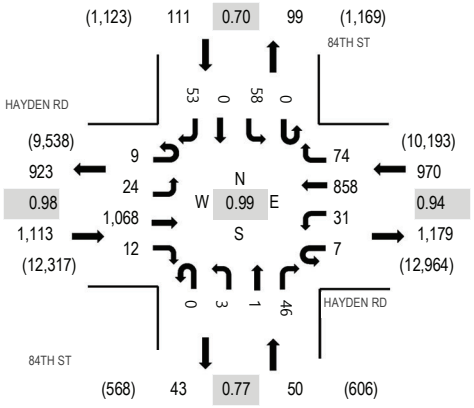
ATTACHMENT B

EXISTING TRAFFIC COUNTS

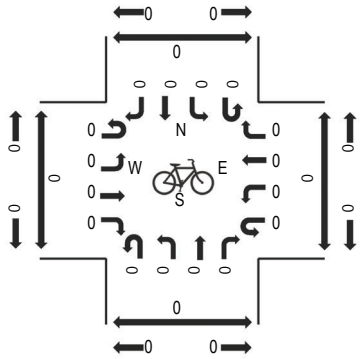
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 84TH ST & HAYDEN RD AM
Date: Tuesday, November 15, 2022
Peak Hour: 11:45 AM - 12:45 PM
Peak 15-Minutes: 12:00 PM - 12:15 PM

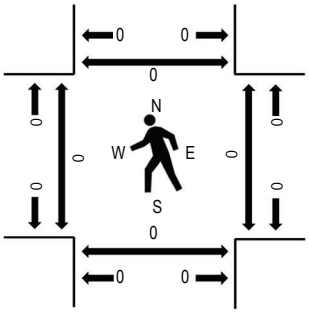
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	HAYDEN RD Eastbound				HAYDEN RD Westbound				84TH ST Northbound				84TH ST Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
12:00 AM	0	0	2	0	2	1	0	1	0	0	0	1	0	1	0	0	8	31	0	0	0	0
12:15 AM	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3	34	0	0	0	0
12:30 AM	0	0	2	1	0	2	1	1	0	0	0	2	0	5	0	0	14	38	0	0	0	0
12:45 AM	0	0	3	0	0	0	1	0	0	0	0	2	0	0	0	0	6	30	0	0	0	0
1:00 AM	0	0	0	2	0	2	2	2	0	0	0	1	0	1	0	1	11	33	0	0	0	0
1:15 AM	0	0	1	0	0	2	2	1	0	0	0	0	0	1	0	0	7	26	0	0	0	0
1:30 AM	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	2	6	22	0	0	0	0
1:45 AM	0	0	0	0	0	0	8	0	0	0	0	1	0	0	0	0	9	20	0	0	0	0
2:00 AM	0	0	1	0	0	0	0	1	0	0	0	0	0	2	0	0	4	14	0	0	0	0
2:15 AM	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	3	15	0	0	0	0
2:30 AM	0	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	4	16	0	0	0	0
2:45 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	3	16	0	0	0	0
3:00 AM	0	0	2	0	0	0	1	1	0	0	0	0	0	1	0	0	5	26	0	0	0	0
3:15 AM	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	4	32	0	0	0	0
3:30 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	4	41	0	0	0	0
3:45 AM	0	0	2	0	0	0	6	4	0	0	0	1	0	0	0	0	13	51	0	0	0	0
4:00 AM	0	0	1	0	2	2	1	2	0	2	0	1	0	0	0	0	11	66	0	0	0	0
4:15 AM	0	0	0	0	2	0	4	4	0	1	0	2	0	0	0	0	13	98	0	0	0	0
4:30 AM	0	0	2	0	0	0	6	2	0	0	0	3	0	1	0	0	14	115	0	0	0	0
4:45 AM	0	1	5	0	1	0	15	6	0	0	0	0	0	0	0	0	28	157	0	0	0	0
5:00 AM	0	1	11	0	0	3	18	7	0	0	0	2	0	1	0	0	43	237	0	0	0	0
5:15 AM	0	1	5	0	0	0	15	4	0	3	0	2	0	0	0	0	30	309	0	0	0	0
5:30 AM	0	6	6	0	0	0	24	14	0	1	0	2	0	3	0	0	56	408	0	0	0	1
5:45 AM	0	7	7	0	0	0	49	36	0	3	0	4	0	2	0	0	108	489	0	0	0	0
6:00 AM	0	2	28	2	0	1	47	25	0	1	0	4	0	4	0	1	115	574	0	0	0	1
6:15 AM	0	5	33	1	2	1	63	18	0	0	0	4	0	2	0	0	129	683	0	0	0	0
6:30 AM	0	1	53	2	0	4	54	10	0	0	0	11	0	1	0	1	137	785	0	0	0	0
6:45 AM	0	5	59	0	0	2	94	23	0	0	0	8	0	1	0	1	193	904	0	0	0	0
7:00 AM	0	7	68	0	0	2	93	28	0	2	0	18	0	4	0	2	224	1,049	0	0	0	0
7:15 AM	0	5	91	1	1	2	102	15	0	2	0	7	0	3	0	2	231	1,153	0	0	1	0
7:30 AM	0	4	89	1	1	4	118	12	0	3	0	18	0	5	0	1	256	1,241	0	0	1	0
7:45 AM	1	9	116	1	0	1	155	29	0	2	0	13	0	4	0	7	338	1,345	0	0	1	1
8:00 AM	1	3	132	0	1	4	135	31	0	2	2	9	0	5	0	3	328	1,351	0	0	0	1
8:15 AM	0	5	126	0	0	3	147	19	0	0	0	11	0	8	0	0	319	1,381	0	0	0	0
8:30 AM	0	4	130	0	0	1	172	33	0	1	0	9	0	7	0	3	360	1,443	0	0	0	0
8:45 AM	0	7	143	2	1	3	141	25	0	4	0	12	0	5	0	1	344	1,476	0	0	0	0

AM Peak

9:00 AM	0	2	136	1	0	4	160	22	0	2	0	10	0	11	0	10	358	1,563	0	0	0	0
9:15 AM	0	6	159	3	2	3	171	12	0	2	0	8	0	9	0	6	381	1,635	0	0	1	0
9:30 AM	0	3	156	3	0	8	188	16	0	2	0	5	0	6	0	6	393	1,754	0	0	0	0
9:45 AM	0	7	161	2	0	2	221	14	0	2	0	11	0	6	0	5	431	1,879	0	0	0	0
10:00 AM	1	5	171	2	0	3	204	17	0	2	0	8	0	17	0	0	430	1,970	0	0	0	0
10:15 AM	1	6	234	0	0	4	209	15	0	1	0	7	0	11	0	12	500	2,081	0	0	0	2
10:30 AM	0	5	237	3	2	4	219	17	0	2	0	12	0	10	0	7	518	2,087	0	0	2	1
10:45 AM	5	10	217	7	2	9	224	22	0	0	0	8	0	8	0	10	522	2,072	0	0	0	0
11:00 AM	3	9	274	0	1	2	211	10	0	0	0	6	0	19	0	6	541	2,112	0	0	0	1
11:15 AM	4	9	283	1	2	3	168	9	0	1	0	5	0	6	0	15	506	2,139	0	0	1	0
11:30 AM	3	3	259	1	3	4	169	23	0	1	1	7	0	13	1	15	503	2,197	1	0	0	2
11:45 AM	2	2	258	4	1	4	221	20	0	0	1	15	0	21	0	13	562	2,244	0	0	0	0
12:00 PM	2	5	280	4	4	6	210	13	0	2	0	14	0	12	0	16	568	2,205	0	0	0	0
12:15 PM	0	11	278	2	1	9	215	19	0	0	0	11	0	7	0	11	564	2,205	0	0	0	0
12:30 PM	5	6	252	2	1	12	212	22	0	1	0	6	0	18	0	13	550	2,188	0	0	0	0
12:45 PM	0	9	259	2	3	3	204	15	0	1	0	10	0	11	0	6	523	2,190	0	0	0	1
1:00 PM	2	9	284	4	0	8	206	22	0	0	0	4	0	15	0	14	568	2,192	0	0	0	0
1:15 PM	1	8	247	2	1	5	238	16	0	0	0	7	0	11	0	11	547	2,185	0	0	0	0
1:30 PM	2	7	263	3	1	6	218	14	0	1	0	13	0	12	0	12	552	2,143	0	0	0	0
1:45 PM	5	3	237	4	1	8	212	19	0	2	0	6	0	16	0	12	525	2,121	0	0	0	0
2:00 PM	3	2	299	3	0	3	207	10	0	0	0	10	0	11	0	13	561	2,125	0	0	0	0
2:15 PM	2	5	233	1	0	4	224	10	0	0	0	6	0	8	0	12	505	2,100	0	0	0	0
2:30 PM	5	4	269	1	0	7	198	11	0	1	0	11	0	12	0	11	530	2,127	0	0	0	2
2:45 PM	1	6	271	1	1	12	191	8	0	2	0	10	0	17	0	9	529	2,163	0	0	0	0
3:00 PM	2	5	266	2	0	6	203	17	0	1	0	7	0	15	1	11	536	2,151	0	0	1	0
3:15 PM	2	10	254	0	0	4	203	18	0	1	0	12	0	16	0	12	532	2,156	0	0	1	0
3:30 PM	0	1	305	8	0	9	193	8	0	0	0	3	0	23	0	16	566	2,197	0	0	1	0
3:45 PM	3	8	253	4	1	9	198	3	0	0	0	7	0	16	0	15	517	2,176	0	0	0	0
4:00 PM	3	4	266	4	1	7	207	3	0	2	0	8	0	18	0	18	541	2,152	0	0	0	0
4:15 PM	2	17	272	3	2	16	193	4	0	2	0	10	0	18	0	26	565	2,094	0	0	0	0
4:30 PM	2	2	279	6	1	11	169	7	0	4	1	10	0	27	0	34	553	1,994	1	0	0	2
4:45 PM	0	4	284	8	0	7	152	7	0	1	0	8	0	14	0	8	493	1,851	1	0	0	0
5:00 PM	3	4	286	6	0	10	136	2	0	2	0	13	0	14	0	7	483	1,780	0	0	0	0
5:15 PM	0	11	280	2	0	15	129	2	0	1	0	11	0	8	0	6	465	1,638	0	0	0	0
5:30 PM	5	5	261	2	0	7	98	5	0	0	0	7	0	15	0	5	410	1,506	0	0	0	0
5:45 PM	0	10	264	2	1	9	95	0	0	3	0	3	0	22	0	13	422	1,376	0	0	0	0
6:00 PM	1	2	201	6	0	8	98	2	0	1	0	5	0	11	0	6	341	1,181	1	0	1	0
6:15 PM	1	3	212	4	1	14	77	6	0	1	0	8	0	3	0	3	333	1,061	0	0	0	0
6:30 PM	1	0	174	11	1	7	69	2	0	0	0	5	0	5	0	5	280	912	0	0	0	0
6:45 PM	2	4	129	2	1	6	70	2	0	3	0	2	0	4	0	2	227	801	0	0	0	0
7:00 PM	0	0	147	4	0	10	46	1	0	2	0	4	1	4	1	1	221	707	0	0	0	0
7:15 PM	1	5	106	3	1	7	39	4	0	0	0	7	0	7	0	4	184	624	0	0	0	0
7:30 PM	0	0	116	1	0	5	28	2	0	0	0	6	0	6	0	5	169	550	0	0	0	0
7:45 PM	0	1	92	3	0	3	28	1	0	0	0	2	0	2	0	1	133	483	0	0	0	0
8:00 PM	1	1	87	4	0	7	19	2	0	1	0	7	0	8	0	1	138	429	0	0	0	0
8:15 PM	0	0	76	4	0	6	18	1	0	0	0	1	0	4	0	0	110	357	0	0	0	0
8:30 PM	0	1	70	1	1	5	14	3	0	0	0	2	0	4	0	1	102	282	0	0	0	0
8:45 PM	0	0	56	1	2	3	12	1	0	0	0	2	0	2	0	0	79	218	0	0	2	0
9:00 PM	0	3	29	1	1	4	12	1	0	1	0	4	0	5	0	5	66	162	0	0	0	0
9:15 PM	0	1	23	1	0	1	4	0	0	0	0	2	0	2	0	1	35	123	0	0	0	0
9:30 PM	0	0	25	1	0	5	3	2	0	0	0	0	0	2	0	0	38	110	0	0	0	0
9:45 PM	0	0	19	2	0	0	0	0	0	0	0	1	0	0	0	1	23	94	0	0	0	0
10:00 PM	2	0	16	1	0	3	2	1	0	0	0	0	0	1	0	1	27	89	0	0	0	0
10:15 PM	0	0	10	4	0	3	1	0	0	0	0	2	0	2	0	0	22	75	0	0	0	0
10:30 PM	0	0	14	1	0	0	3	1	0	0	0	0	0	2	0	1	22	63	0	0	0	0
10:45 PM	0	0	13	0	0	2	2	1	0	0	0	0	0	0	0	0	18	51	0	0	0	0
11:00 PM	0	0	4	2	2	1	0	1	0	0	0	1	0	2	0	0	13	40	0	0	0	0
11:15 PM	0	0	6	3	0	1	0	0	0	0	0	0	0	0	0	0	10		0	0	0	0
11:30 PM	0	0	3	0	0	2	1	1	0	0	0	2	0	1	0	0	10		0	0	0	0
11:45 PM	0	0	2	0	0	0		0	0	0	0	2	0	2	0	0	7		0	0	0	0
Count Total	80	318	11,743	176	58	389	8,901	845	0	78	5	523	1	640	3	479	24,239		4	0	13	15
Peak Hour	9	24	1,068	12	7	31	858	74	0	3	1	46	0	58	0	53	2,244		0	0	0	0

Midday Peak

PM Peak

ATTACHMENT C

CRASH ANALYSIS WORKSHEETS

Hayden and 84th St

SUMMARY BY YEAR

SEVERITY / INCIDENTS	**2019**	**2020**	**2021**	**Totals**	**Checks**
Fatal Injury Incidents					
Non-fatal Injury Incidents	2	2	2	6	
PDO Incidents	5	3	5	13	
TOTALS	7	5	7	19	
Pedestrian Incidents					
Pedestrians Involved					
Bicycle Incidents					
Bicyclists Involved					
SEVERITY / INVOLVMENT					
Fatal Injuries					
Non-Fatal Injuries	3	2	5	10	
PDO Vehicles	12	5	11	28	
Pedestrians Fatally Injured					
Pedestrians Non-Fatally Injured					
Bicyclists Fatally Injured					
Bicyclists Non-Fatally Injured					
COLLISION MANNER					
SINGLE_VEHICLE 1		1		1	
ANGLE 2	1	2		3	
LEFT_TURN 3	3		4	7	
REAR_END 4	1	1		2	
HEAD_ON 5					
SIDESWIPE_SAME_DIRECTION 6	2	1	2	5	
IDESWIPE_OPPOSITE_DIRECTION 7					
REAR_TO_SIDE 8					
REAR_TO_REAR 9					
OTHER 97			1	1	
UNKNOWN 99					
TOTALS	7	5	7	19	

CRASH STATISTICS

2019-2021

Hayden and 84th St

Involvement

	# Incidents	Totals		# Motorists	# Non-Motorists
Incidents	19	40	Veh	48	0
Fatal	0	0	Ppl	0	0
Injury	6	10	Ppl	0	0
PDO	13	28	Veh		

Peds/Bikes Summary

	Incidents	Persons	Injuries Fatal	Injuries Non-Fatal
Pedestrian:	0	0	0	0
Bicycle:	0	0	0	0

Circumstances

Hit & Run?	2
Intersection Related?	10

Code	LightCondition	No.
1	DAYLIGHT	16
2	DAWN	0
3	DUSK	1
4	DARK_LIGHTED	1
5	DARK_NOT_LIGHTED	1
6	DARK_UNKNOWN_LIGHTING	0
99	UNKNOWN	0
	Check Total	19

Code	Weather	No.
1	CLEAR	19
2	CLOUDY	0
3	SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	0
4	RAIN	0
5	SNOW	0
6	SEVERE_CROSSWINDS	0
7	BLOWING_SAND_SOIL_DIRT	0
8	FOG_SMOG_SMOKE	0
9	BLOWING_SNOW	0
97	OTHER	0
99	UNKNOWN	0
	Check Total	19

Code	TrafficWayType	No.
1	ONE_WAY_TRAFFICWAY	0
2	TWO_WAY_NOT_DIVIDED	2
3	ED_WITH_CONTINUOUS_LEFT_TURN_LANE	0
4	_UNPROTECTED_PAINTED_4_FEET_MEDIAN	6
5	IDED_POSITIVE_MEDIAN_BARRIER	9
99	UNKNOWN	2
	Check Total	19

Code	Weekday	No.
1	Sunday	2
2	Monday	2
3	Tuesday	3
4	Wednesday	0
5	Thursday	5
6	Friday	4
7	Saturday	3
	Check Total	19

Code	JunctionRelation	No.
0	NOT_JUNCTION_RELATED	7
1	INTERSECTION_NON_INTERCHANGE	9
2	INTERSECTION_RELATED_NON_INTERCHANGE	1
3	ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	0
4	RAILWAY_GRADE_CROSSING	0
5	CROSSOVER_RELATED	0
6	FRONTAGE_ROAD_NON_INTERCHANGE	0
7	DRIVEWAY	1
8	ALLEY_ACCESS_RELATED	0
9	UNKNOWN_NON_INTERCHANGE	0
10	THRU_ROADWAY	0
11	INTERSECTION_INTERCHANGE	0
12	INTERSECTION_RELATED_INTERCHANGE	0
13	ENTRANCE_EXIT_RAMP_INTERCHANGE	0
14	FRONTAGE_ROAD_INTERCHANGE	0
15	OTHER_PART_OF_INTERCHANGE	0
16	<not defined>	0
17	UNKNOWN_INTERCHANGE	0
18	UNKNOWN_JUNCTION	0
99	UNKNOWN	1
109	OTHER_NON_INTERCHANGE	0
	Check Total	19

Code	CollisionManner	No.
1	SINGLE_VEHICLE	1
2	ANGLE (front to side)(other than left turn)	3
3	LEFT_TURN	7
4	REAR_END	2
5	HEAD_ON	0
6	SIDESWIPE_SAME_DIRECTION	5
7	SIDESWIPE_OPPOSITE_DIRECTION	0
8	REAR_TO_SIDE	0
9	REAR_TO_REAR	0
97	OTHER	1
99	UNKNOWN	0
	Check Total	19

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

Code	First Harmful Event	No.
1	OVERTURN_ROLLOVER	0
2	FIRE_EXPLOSION	0
3	IMMERSION	0
4	JACKKNIFE	0
5	CARGO_EQUIPMENT_LOSS_SHIFT	0
6	FELL_JUMPED_FROM_VEHICLE	0
7	THROWN_OR_FALLING_OBJECT	0
8	OTHER_NON_COLLISION	0
9	EQUIPMENT_FAILURE_TIRES_BRAKES	0
10	SEPARATION_OF_UNITS	0
11	RAN_OFF_ROAD_RIGHT	0
12	RAN_OFF_ROAD_LEFT	0
13	CROSS_MEDIAN	0
14	CROSS_CENTERLINE	0
15	DOWNHILL_RUNAWAY	0
16	MOTOR_VEHICLE_IN_TRANSPORT	16
17	PEDESTRIAN	0
18	PEDALCYCLE	0
19	RAILWAY_VEHICLE_TRAIN_ENGINE	0
20	LIGHT_RAILWAY_RAILCAR_VEHICLE	0
21	ANIMAL_WILD_NON_GAME	0
22	ANIMAL_WILD_GAME	0
23	ANIMAL_PET	0
24	ANIMAL_LIVESTOCK	0
25	PARKED_MOTOR_VEHICLE	2
26	WORK_ZONE_MAINTENANCE_EQUIPMENT	0
27	STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	0
28	OTHER_NON_FIXED_OBJECT	0
29	IMPACT_ATTENUATOR_CRASH_CUSHION	0
30	BRIDGE_OVERHEAD_STRUCTURE	0
31	BRIDGE_RAIL	0
32	CULVERT	0
33	CURB	0
34	DITCH	0
35	EMBANKMENT	0
36	GUARDRAIL_FACE	0
37	GUARDRAIL_END	0
38	CONCRETE_TRAFFIC_BARRIER	0
39	CABLE_TRAFFIC_BARRIER	0
40	OTHER_TRAFFIC_BARRIER	0
41	TREE_BUSH_STUMP_STANDING	0
42	TRAFFIC_SIGN_SUPPORT	0
43	TRAFFIC_SIGNAL_SUPPORT	0
44	UTILITY_POLE_LIGHT_SUPPORT	0
45	OTHER_POST_POLE_OR_SUPPORT	0
46	FENCE	1
47	MAILBOX	0
48	BUILDING	0
49	OTHER_FIXED_OBJECT	0
99	UNKNOWN	0
255	Not Reported	0
	Check Total	19

Code	Month	No.
1	January	2
2	February	1
3	March	3
4	April	1
5	May	1
6	June	0
7	July	1
8	August	4
9	September	2
10	October	1
11	November	1
12	December	2
	Total	19

Code	(Unit) SurfaceCondition	No.
1	DRY	40
2	WET	0
3	SNOW	0
4	SLUSH	0
5	ICE_FROST	0
6	WATER_STANDING_MOVING	0
7	SAND	0
8	MUD_DIRT_GRAVEL	0
9	OIL	0
97	OTHER	0
99	UNKNOWN	0
	Total	40

Additional Useful Information

Vehicle Action Codes

1	GOING_STRAIGHT_AHEAD
2	SLOWING_IN_TRAFFICWAY
3	STOPPED_IN_TRAFFICWAY
4	MAKING_LEFT_TURN
5	MAKING_RIGHT_TURN
6	MAKING_U_TURN
7	OVERTAKING_PASSING
8	CHANGING_LANES
9	NEGOTIATING_A_CURVE
10	BACKING
11	Avoiding_Vehicle_Object_Pedestrian
12	ENTERING_PARKING_POSITION
13	LEAVING_PARKING_POSITION
14	PROPERLY_PARKED
15	IMPROPERLY_PARKED
16	DRIVERLESS_MOVING_VEHICLE
17	CROSSING_ROAD
18	WALKING_WITH_TRAFFIC
19	WALKING_AGAINST_TRAFFIC
20	STANDING
21	LYING
22	GETTING_ON_OR_OFF_VEHICLE
23	WORKING_ON_OR_PUSHING_VEHICLE
24	WORKING_ON_ROAD
97	OTHER
99	UNKNOWN

Body Styles

-1	NOT_REPORTED
1	\Passenger Vehicles, including RVs
53	/
54	\TRUCKS
88	/
89	\MOBILEHOME (NOT RVS)
92	/
93	\TRAILERS
120	/
121	\MOTORCYCLES
128	/
254	UNKNOWN
255	NOT REPORTED

<-------- LOCATION -------->							<-DATE & TIME->		<-------- UNITS -------->														<---------- PERSON ---------->									<------- SEVERITY ------->								<----- GENERAL ----->					
INCIDNT	ON	STREET	MP	OFF-SET	D R	DIS-TANCE	INTERSECT STREET	OFCR NCIC	NCIC	YYMMDD	HH:MM	D W	TO-TAL	SRFC U1	SRFC U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	BSTYLE U1	BSTYLE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VLTN D1	VLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INJ	FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	H R	LT CN	WE CN	JCT REL	TRF CWY	HE CD	M C
3512552	07	HAYDEN			P	0	84th St		725	190217	12:43	1	2	1	1	1	1	1	0	0	0	44	44	E	S	4	1	3	0	1	1	1	2	20	1	0	0	255		1		2	0	0	0	0	0	N	1	1	1	4	16	2
																													4		2		0		0																
3517982	07	HAYDEN			P	0	84th St		725	190319	17:35	3	2	1	1	1	1	1	0	0	0	44	44	E	S	4	1	2	0	1	1	99	99	7	1	0	0	255	1			0		0				N	3	1	1	5	16	3
3518214	07	HAYDEN			M	25	84th St		725	190315	13:33	6	2	1	1	1	1	1	0	0	0	47	44	S	S	4	1	3	0	1	4	1	1	99	0	0	0	255	1			0		0				N	1	1	2	4	16	6
																													1		1		99		0																
3576532	07	HAYDEN			P	0	84th St		725	190808	15:47	5	2	1	1	1	1	1	0	99	0	30	50	N	N	1	3	3	0	1	1	1	1	4	1	0	0	255	1			0		0				N	1	1	1	4	16	4
																													4		1		0		0																
3576534	07	HAYDEN			P	150	84th St		725	190805	13:19	2	2	1	1	1	1	1	0	0	0	50	47	S	S	1	1	2	0	1	1	1	1	1	1	0	0	255	1			0		0				N	1	1	0	5	16	6
3596887	07	HAYDEN			P	0	84th St		725	191004	15:55	6	2	1	1	1	1	1	0	0	0	17	17	SE	S	4	1	3	0	1	1	1	1	20	1	0	0	255		1		1	0	0	0	0	0	N	1	1	1	5	16	3
																													4		2		0		0																
3626275	07	HAYDEN			P	0	84th St		725	191223	10:23	2	4	1	1	1	1	1	0	0	0	50	30	NW	S	4	1	5	0	1	1	1	1	20	1	0	0	255	1			0		0				N	1	1	1	5	16	3
														1	1	1	1	1	0	0	0	47	44	S	S	1	1			1	4	1	1	1	0	0	0	255																				
																													1		1		1		0																
3634000	07	84TH			P	0	Hayden Rd		725	200112	11:59	1	2	1	1	1	1	1	0	0	0	44	42	SE	W	4	1	3	0	1	1	1	1	20	1	0	0	255	1			0		0				N	1	1	0	4	16	2
																													4		1		0		0																
3679948	07	HAYDEN			P	0	84th St		725	200404	01:32	7	1	1		1		2		99		254		W		1		1	0	1		1		2		0			1			0		0				Y	4	1	0	99	46	1
3681900	07	84TH			P	0	Hayden Rd		725	200813	16:54	5	2	1	1	1	1	1	0	0	0	47	47	E	E	4	1	2	0	1	1	2	1	20	1	0	0	255		1		1	0	0	0	0	0	N	1	1	0	5	16	4
3681921	07	HAYDEN			M	279	84th St		725	200815	10:25	7	2	1	1	1	1	1	0	0	0	12	12	N	N	1	1	2	0	1	1	1	1	13	1	0	0	255	1			0		0				N	1	1	0	5	16	6
3684977	07	84TH			P	0	Hayden Rd		725	200903	12:02	5	2	1	1	1	1	1	0	0	0	44	41	NE	SW	4	1	2	0	1	1	1	3	20	1	0	0	255		1		1	0	0	0	0	0	N	1	1	1	5	16	2
3737582	07	84TH			P	1000	Hayden Rd		725	210121	14:32	5	3	1	1	1	1	1	0	97	0	83	44	S	S	16	14	3	0	1	1	1	1	97	1	0	0	255	1			0		0				N	1	1	99	2	25	6
														1		1		1		97		30		S		14			1		1		1		0																
3748193	07	HAYDEN			P	0	84th St		725	210305	13:45	6	2	1	1	1	1	1	0	99	0	44	50	NE	S	4	1	2	0	1	1	1	1	7	1	0	0	255	1			0		0				N	1	1	1	4	16	3
3782464	07	HAYDEN			P	0	84th St		725	210513	13:35	5	2	1	1	1	1	1	0	0	0	44	41	S	W	4	1	2	0	1	1	3	3	20	1	0	0	255		1		2	0	0	0	0	0	N	1	1	1	5	16	3
3800704	07	HAYDEN			P	118	84th St		725	210709	10:48	6	2	1	1	1	1	1	0	0	0	44	83	W	S	5	4	2	0	1	1	1	1	1	1	0	0	255	1			0		0				N	1	1	7	99	16	6
3835191	07	84TH			M	275	Hayden Rd		725	210928	17:50	3	2	1	1	1	1	1	0	99	0	254	44	99	W	99	14	2	0	1	1	99	1	97	1	0	0	255	1			0		0				Y	1	1	0	2	25	97
3854625	07	84TH			P	0	Hayden Rd		725	211102	17:41	3	2	1	1	1	1	1	0	0	0	44	50	NW	SE	4	1	3	0	1	1	2	3	20	1	0	0	255		1		3	0	0	0	0	0	N	5	1	1	4	16	3
																													4		3		0		0																
3858481	07	HAYDEN			P	590	84th St		725	211218	12:59	7	2	1	1	1	1	1	0	0	0	31	50	S	S	4	1	3	0	1	1	1	1	20	1	0	0	255	1			0		0				N	1	1	0	5	16	3
																													4		1		0		0																

ATTACHMENT D

SIGNAL WARRANT ANALYSIS

Volume-Based Traffic Signal Warrants Analysis Summary

Warrant		Hour(s) of the Day	Hours Required to Meet Warrant	Hours Met	Is Warrant Met?
Warrant 1. Eight-Hour Vehicular Volume	Condition A: Minimum Vehicular Volume	Any Eight Hours	8	3	No
	Condition B: Interruption of Continuous Traffic	Any Eight Hours	8	10	Yes
	Combination of Condition A & Condition B	Any Eight Hours	8	7	No
	Overall (at least 1 of the 3 conditions required to meet warrant)				**Yes**
Warrant 2. Four-Hour Vehicular Volume		Any Four Hours	4	9	**Yes**
Warrant 3. Peak Hour		Any One/Peak Hour	1	8	**Yes**

Hayden Airpark Development

Existing 2022 Counts - 84th Street and Hayden Road

Signal Warrant Analysis

MUTCD Warrants 1-3

Major Street: Hayden Road — Speed Limit: 45 — Lanes:* 2

Minor Street: 84th Street — Speed Limit: 25 — Lanes:* 1

Locale: City of Scottsdale — *Number of Approach Lanes of Moving Traffic:

Major Street vph - total of both approaches	20	26	10	24	56	214	535	956	1,269	1,462	1,855	1,966	2,066	2,056	1,992	1,995	1,943	1,650	1,117	654	396	138	80	30
Minor Street volume - higher-volume approach (vph)	6	5	3	1	9	17	28	65	50	59	75	109	94	103	93	125	163	90	39	32	20	16	7	5
Direction of higher-volume minor approach	SB	SB	SB	SB	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
Beginning of hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00

Critical speed of major street traffic above 40 mph — X

In built-up area of isolated community less than 10,000 population

Urban — x

Warrant 1, Eight-Hour Vehicular Volume

Condition A *Minimum Vehicular Volume*					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	500	600	600	500																									
(100%[a])	150	150	200	200																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Minimum Reqmts	350	420	420	350	**420**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
(70%[c])	105	105	140	140	**105**	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	Yes	No	No	No	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Condition B *Interruption of Cont. Traffic*					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	750	900	900	750																									
(100%[a])	75	75	100	100																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Minimum Reqmts	525	630	630	525	**630**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
(70%[c])	53	53	70	70	**53**	No	No	No	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Combination *of Conditions A & B*					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Condition A	400	480	480	400																									
(80%[b])	120	120	160	160																									
Condition B	600	720	720	600																									
(80%[b])	60	60	80	80																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Condition A	280	336	336	280	**336**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
(56%[d])	84	84	112	112	**84**	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Condition B	420	504	504	420	**504**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
(56%[d])	42	42	56	56	**42**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 2, Four Hour Vehicular Volume					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 3, Peak Hour					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

CivTech

December 2022

Volume-Based Traffic Signal Warrants Analysis Summary

Warrant		Hour(s) of the Day	Hours Required to Meet Warrant	Hours Met	Is Warrant Met?
Warrant 1. Eight-Hour Vehicular Volume	Condition A: Minimum Vehicular Volume	Any Eight Hours	8	4	No
	Condition B: Interruption of Continuous Traffic	Any Eight Hours	8	10	Yes
	Combination of Condition A & Condition B	Any Eight Hours	8	7	No
	Overall (at least 1 of the 3 conditions required to meet warrant)				**Yes**
Warrant 2. Four-Hour Vehicular Volume		Any Four Hours	4	10	**Yes**
Warrant 3. Peak Hour		Any One/Peak Hour	1	8	**Yes**

Hayden Airpark Development

2024 Background Volumes - 84th Street and Hayden Road

Signal Warrant Analysis

MUTCD Warrants 1-3

Major Street: Hayden Road — Speed Limit: 45 — Lanes:* 2

Minor Street: 84th Street — Speed Limit: 25 — Lanes:* 1

Locale: City of Scottsdale — *Number of Approach Lanes of Moving Traffic:

Major Street vph - total of both approaches	20	27	10	25	58	223	557	995	1,320	1,521	1,929	2,045	2,149	2,138	2,071	2,075	2,021	1,716	1,162	680	412	143	83	31
Minor Street volume - higher-volume approach (vph)	6	5	3	1	9	18	29	68	52	61	78	113	98	107	97	130	170	94	41	33	21	17	7	5
Direction of higher-volume minor approach	SB	SB	SB	SB	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
Beginning of hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00

Critical speed of major street traffic above 40 mph — X

In built-up area of isolated community less than 10,000 population

Urban — x

Warrant 1, Eight-Hour Vehicular Volume

Condition A *Minimum Vehicular Volume*					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	500	600	600	500																									
(100%[a])	150	150	200	200																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Minimum Reqmts	350	420	420	350	**420**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
(70%[c])	105	105	140	140	**105**	No	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No	Yes	Yes	No	No	No	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Condition B *Interruption of Cont. Traffic*					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	750	900	900	750																									
(100%[a])	75	75	100	100																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Minimum Reqmts	525	630	630	525	**630**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
(70%[c])	53	53	70	70	**53**	No	No	No	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Combination *of Conditions A & B*					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Condition A	400	480	480	400																									
(80%[b])	120	120	160	160																									
Condition B	600	720	720	600																									
(80%[b])	60	60	80	80																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Condition A	280	336	336	280	**336**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
(56%[d])	84	84	112	112	**84**	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Condition B	420	504	504	420	**504**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
(56%[d])	42	42	56	56	**42**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 2, Four Hour Vehicular Volume					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 3, Peak Hour					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Volume-Based Traffic Signal Warrants Analysis Summary

Warrant		Hour(s) of the Day	Hours Required to Meet Warrant	Hours Met	Is Warrant Met?
Warrant 1. Eight-Hour Vehicular Volume	Condition A: Minimum Vehicular Volume	Any Eight Hours	8	4	No
	Condition B: Interruption of Continuous Traffic	Any Eight Hours	8	11	Yes
	Combination of Condition A & Condition B	Any Eight Hours	8	7	No
	Overall (at least 1 of the 3 conditions required to meet warrant)				**Yes**
Warrant 2. Four-Hour Vehicular Volume		Any Four Hours	4	10	**Yes**
Warrant 3. Peak Hour		Any One/Peak Hour	1	8	**Yes**

Hayden Airpark Development

2024 Total Volumes - 84th Street and Hayden Road

Signal Warrant Analysis

MUTCD Warrants 1-3

Major Street: Hayden Road — Speed Limit: 45 — Lanes:* 2

Minor Street: 84th Street — Speed Limit: 25 — Lanes:* 1

Locale: City of Scottsdale — *Number of Approach Lanes of Moving Traffic:

Major Street vph - total of both approaches	21	27	10	25	59	226	563	1,006	1,334	1,537	1,950	2,065	2,170	2,160	2,093	2,095	2,040	1,731	1,172	686	415	145	84	32
Minor Street volume - higher-volume approach (vph)	6	5	3	1	11	20	33	77	59	61	78	113	98	107	97	130	170	94	41	33	21	17	7	6
Direction of higher-volume minor approach	SB	SB	SB	SB	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	NB
Beginning of hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00

Critical speed of major street traffic above 40 mph — X

In built-up area of isolated community less than 10,000 population

Urban — x

Warrant 1, Eight-Hour Vehicular Volume

Condition A *Minimum Vehicular Volume*					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	500	600	600	500																									
(100%[a])	150	150	200	200																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Minimum Reqmts	350	420	420	350	**420**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
(70%[c])	105	105	140	140	**105**	No	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No	Yes	Yes	No	No	No	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Condition B *Interruption of Cont. Traffic*					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Minimum Reqmts	750	900	900	750																									
(100%[a])	75	75	100	100																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Minimum Reqmts	525	630	630	525	**630**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
(70%[c])	53	53	70	70	**53**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Combination *of Conditions A & B*					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Condition A	400	480	480	400																									
(80%[b])	120	120	160	160																									
Condition B	600	720	720	600																									
(80%[b])	60	60	80	80																									
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**																								
Condition A	280	336	336	280	**336**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
(56%[d])	84	84	112	112	**84**	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Condition B	420	504	504	420	**504**	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
(56%[d])	42	42	56	56	**42**	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Warrant met?	**No**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 2, Four Hour Vehicular Volume					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Warrant 3, Peak Hour					Criteria	Hour																							
Lanes (**M**/**m**):	1/1	2+/1	2+/2+	1/2+	**2/1**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100% *See to the right*																													
70% *See to the right*					**Use**	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Warrant met?	**Yes**					**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

CivTech

December 2022