CORE-5 BUSINESS CENTER

TRAFFIC IMPACT ANALYSIS
DPR 20-00011

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1 EXECUTIVE SUMMARY

This Traffic Impact Analysis (TIA) evaluates the potential traffic impacts of the Core5 Business Center project. The project is located on a 11.17-acre site located west of Wilson Avenue and south of East Rider Street. Based on the Institute of Transportation Engineers, *Trip Generation* 10th Edition vehicle trip generation rates, the project would generate 529 daily trips including 30 AM peak hour and 41 PM peak hour trips.

The project site would be accessible via three driveways; a truck access driveway from Wilson Avenue for access to the loading bays and trailer parking on the eastern portion of the project site, a driveway from Wilson Avenue for passenger car access, and a driveway for passenger car from East Rider Street.

Five study area intersections including three project driveways, listed in Section 2.2 – Study Area and Analysis Scenarios, were evaluated during the AM and PM peak hours, which are defined as the hours with the highest traffic volumes during the 7 AM to 9 AM and 4 PM to 6 PM peak commute periods. AM and PM peak hour traffic operations were evaluated for the following scenarios:

- Existing Condition
- Existing plus Project Condition
- Opening Year Baseline (corresponding to the project opening year 2022)
- Opening Year plus project

Existing plus Project Intersection Analysis Results

All of the intersections would operate with satisfactory LOS of D or better in the Existing plus Project Condition with the exception of Wilson Avenue/Rider Street which would operate at LOS F during AM peak hour and LOS E during the PM peak hour. To mitigate the project's impact at Wilson Avenue/Rider Street, a traffic signal is recommended. The intersection would operate at LOS A in the AM and PM peak hour with the mitigation improvement.

Opening Year plus Project Intersection Analysis Results

All of the intersections would operate with satisfactory LOS of D or better in the Opening Year plus Project Condition with the exception of Wilson Avenue/Rider Street which would operate at LOS F during AM peak hour and LOS E during PM peak hour.

To mitigate the project's impact at Wilson Avenue/Rider Street, a traffic signal is recommended. The intersection would operate at LOS A in the AM and LOS B in the PM peak hour with the mitigation improvement.

2 INTRODUCTION

This Traffic Impact Analysis (TIA) has been prepared by EPD Solutions, Inc. (EPD) to analyze the potential transportation-related impacts of the proposed Core5 Business Center project. The scope of work for this TIA was reviewed and approved by the City of Perris and is provided in Appendix A. The TIA was prepared according to the approved scope of work using methodologies and significance criteria consistent with the requirements of the City of Perris Transportation Impact Analysis guidelines, General Plan, Perris Valley Commerce Center Specific Plan, and applicable provisions of the California Environmental Quality Act (CEQA).

2.1 Project Description

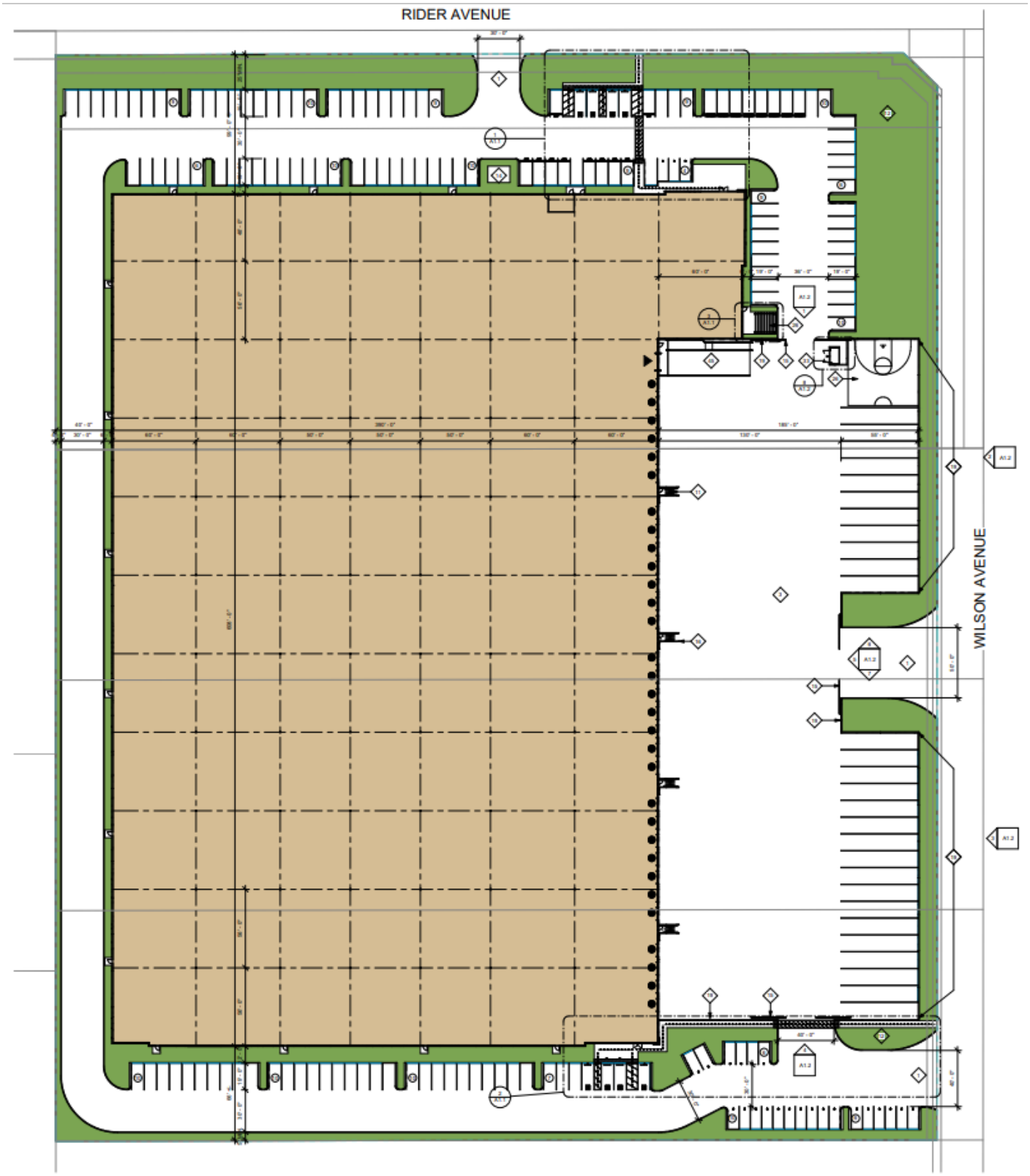
The proposed project is located on a 11.17-acre site on the west side of Wilson Avenue and south of East Rider Street in the City of Perris, California. The location of the project is shown in Figure 1 - Project Location, and the project site plan is shown in Figure 2 – Project Site Plan. The project proposes to construct a new 248,442 square-foot High-Cube Warehouse Building that would operate 7 days a week 24 hours a day. The site is mostly vacant except three large-lot, single-family residences.

The project site would be accessible via three driveways; a truck access driveway from Wilson Avenue for access to the loading bays and trailer parking on the eastern portion of the project site, a driveway from Wilson Avenue for passenger car access, and a driveway for passenger cars from East Rider Street.

Truck and trailer parking and loading would be located on the eastern portion of the project site. The main access to the truck court area would be from Wilson Avenue. Passenger car parking would be available within the northern, and southern portions of the project site.

Figure 1: Project Location

Figure 2: Project Site Plan



2.2 Study Area and Analysis Scenarios

The City of Perris Transportation Impact Analysis Guidelines for CEQA provides thresholds for determining when a TIA is needed and guidance on selecting study area intersections. According to Exhibit A of the TIA Guidelines, a development requires preparation of a TIA when the average daily trips is more than 500 trips. The Core5 Business Center project would generate 529 daily vehicle trips, requiring the preparation of a TIA. The study area was selected to include those intersections immediately adjacent to the project where the project would have the most effect on traffic volumes. This TIA includes two stop-controlled intersections and the proposed project driveway on Harvill Avenue. The following intersections were included in the analysis:

1. Redlands Avenue/Rider Street
2. Wilson Avenue/Rider Street
3. Project Driveway/Rider Street
4. Wilson Avenue/North Project Driveway
5. Wilson Avenue/South Project Driveway

The location of the study area intersections is shown on Figure 3 – Project Study Area. Study area intersections were evaluated during the AM and PM peak hours, which are defined as the hour with the highest traffic volumes during the 7 AM to 9 AM and 4 PM to 6 PM peak commute periods. AM and PM peak hour traffic operations were evaluated for the following scenarios:

- Existing Condition
- Existing plus Project Condition
- Opening Year (Cumulative) Baseline (corresponding to the project opening year 2022)
- Opening Year (Cumulative) plus project

The traffic counts for this study were utilized from the existing available counts from the approved TIA prepared for the approved TIA prepared for Rider-Redlands Warehouse (PLN19-00016). This approved study was provided by the City of Perris. Existing turning movement counts in this study were taken on Thursday, May 30, 2019. As per City's requirements, a growth of three percent was applied to the existing counts taken from the Rider-Redlands study to obtain year 2020 counts. Forecast traffic volumes for the Cumulative conditions were developed by applying a growth rate of three percent per year to the 2022 traffic counts and adding traffic from nearby cumulative development projects (approved and not yet built and those under review).

Figure 3 : Project Study Area

2.3 Methodology

Intersection operations are evaluated using Level of Service (LOS), which is a measure of the delay experienced by drivers on a roadway facility. LOS A indicates free-flow traffic conditions and is generally the best operating conditions. LOS F is an extremely congested condition and is the worst operating condition from the driver's perspective. In this report, LOS at signalized and unsignalized intersections is calculated using the Highway Capacity Manual (HCM), 6th Edition methodology. All signalized intersection analysis input parameters were as outlined in Exhibit C of the Riverside County Transportation Department *Traffic Impact Analysis Preparation Guide*.

LOS at signalized intersections is defined in terms of the weighted average control delay for the intersection as a whole. Control delay is a measure of the increase in travel time that is experienced due to traffic signal control and is expressed in terms of average control delay per vehicle (in seconds). Control delay is determined based on the intersection geometry and volume, signal cycle length, phasing and coordination along the arterial corridor. Table 1shows the relationship between control delay and LOS at a signalized intersection.

Table 1. Relationship between Control Delay and LOS at a Signalized Intersection

LOS	Delay (Seconds per Vehicle)
A	≤ 10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	>80

Unsignalized intersections are categorized as either all-way stop control (AWSC) or two-way stop control (TWSC). LOS at AWSC intersections is determined by the weighted average control delay of the overall intersection. The HCM TWSC intersection methodology calculates LOS based on the delay experienced by drivers on the minor (stop-controlled) approaches to the intersection. For TWSC intersections, LOS is determined for each minor-street movement, as well as the major-street left-turns. The relationship between delay and LOS at Unsignalized intersections is shown in Table 2.

Table 2. Relationship between Delay and LOS an Unsignalized Intersection

LOS	Delay (seconds)
A	0-10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	>50

2.4 LOS Criteria

Per the City of Perris General Plan, the minimum LOS for City intersections is LOS D, except for intersections of any arterials and expressways with SR-74, Ramona-Cajalco Expressway and the I-215 ramps. The project would cause a significant impact if it causes an intersection to operate at worse than LOS D, or worsens the LOS at an intersection already operating at LOS E or F in the no-project condition.

2.5 Significance Criteria

The city of Perris lists the following criteria to evaluate if the addition of project trips will result in a significant impact. A project-related impact is considered direct if:

- A study intersection operates at an acceptable LOS for existing conditions (without the project) and the addition of 50 or more a.m. or p.m. peak hour project trips causes the intersection to operate at an unacceptable Level of Service for existing plus project conditions.
- A study intersection operates at an unacceptable LOS for existing conditions (without the project) and the addition of 50 or more a.m. or p.m. peak hour project trips causes the intersection delay to increase by 2 seconds or more.
- A study intersection is forecast to operate at an unacceptable LOS with the addition of cumulative/background traffic and 50 or more a.m. or p.m. peak hour project trips.

3 BASELINE CONDITIONS

This section discusses the baseline (without project) conditions. Baseline conditions are those conditions that exist within the study area in the existing condition and that are forecast to occur in the future, without the proposed project.

3.1 Existing Transportation System

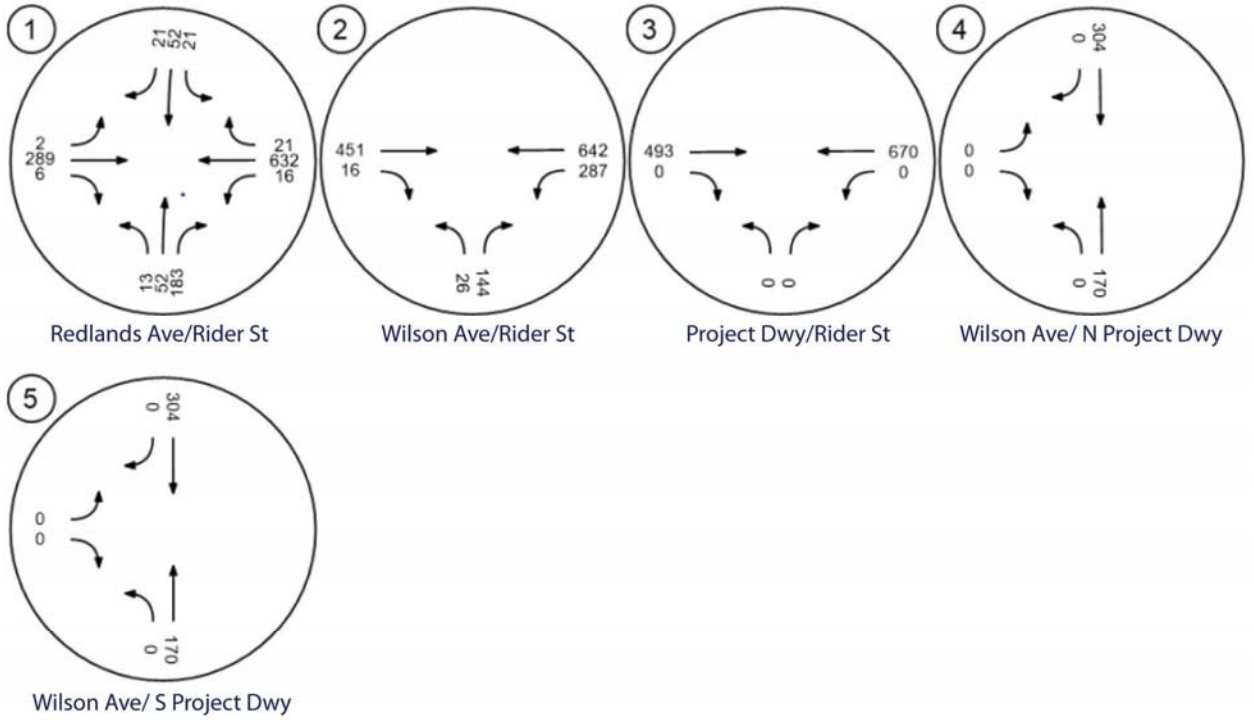
Access to the project site is provided from Wilson Avenue and East Rider Street. East Rider Street has a speed limit of 35 mph near the project site. Rider Street is an east-west roadway east of and perpendicular to Interstate 215. There are no sidewalks present at the immediate vicinity of the project area. Sidewalk network providing connections to an adjacent community begins approximately 850 feet east of the Wilson Avenue/Rider Street intersection. The main project access and parking for passenger cars would be from East Rider Street. Truck access to the project site is provided via a driveway on Wilson Avenue. Additional passenger car access is provided towards the south of the project site through Wilson Avenue.

3.2 Existing Year Traffic Volumes and Levels of Service

Traffic counts at the existing study area intersections shown in Figure 3 – Project Study Area, were collected on Thursday, May 30, 2019. The traffic counts for this study were utilized from the existing available counts from the approved TIA prepared for the Rider-Redlands Warehouse (PLN19-00016). This approved study was provided by the City of Perris and is provided as Appendix B. The counts were taken on a typical weekday when schools were in session. Baseline AM and PM peak hour traffic volumes are shown on Figure 4 and Figure 5 respectively.

A growth of three percent was applied to the existing counts taken from the Rider-Redlands study to obtain year 2020 counts. The existing Levels of Service at the study area intersections were determined using the HCM methodology, described previously in section 1.3. Table 3 shows the existing AM and PM peak hour levels of service at study intersections. All LOS calculations are provided in Appendix C. As shown in Table 3, all study intersections operate at satisfactory LOS D or better during the AM and PM peak hours in the existing condition except for the intersection of Wilson Ave/Rider St which operates at LOS F in the AM peak hour and LOS E in the PM peak hour.

Figure 4: Existing AM Peak Hour Traffic Volumes



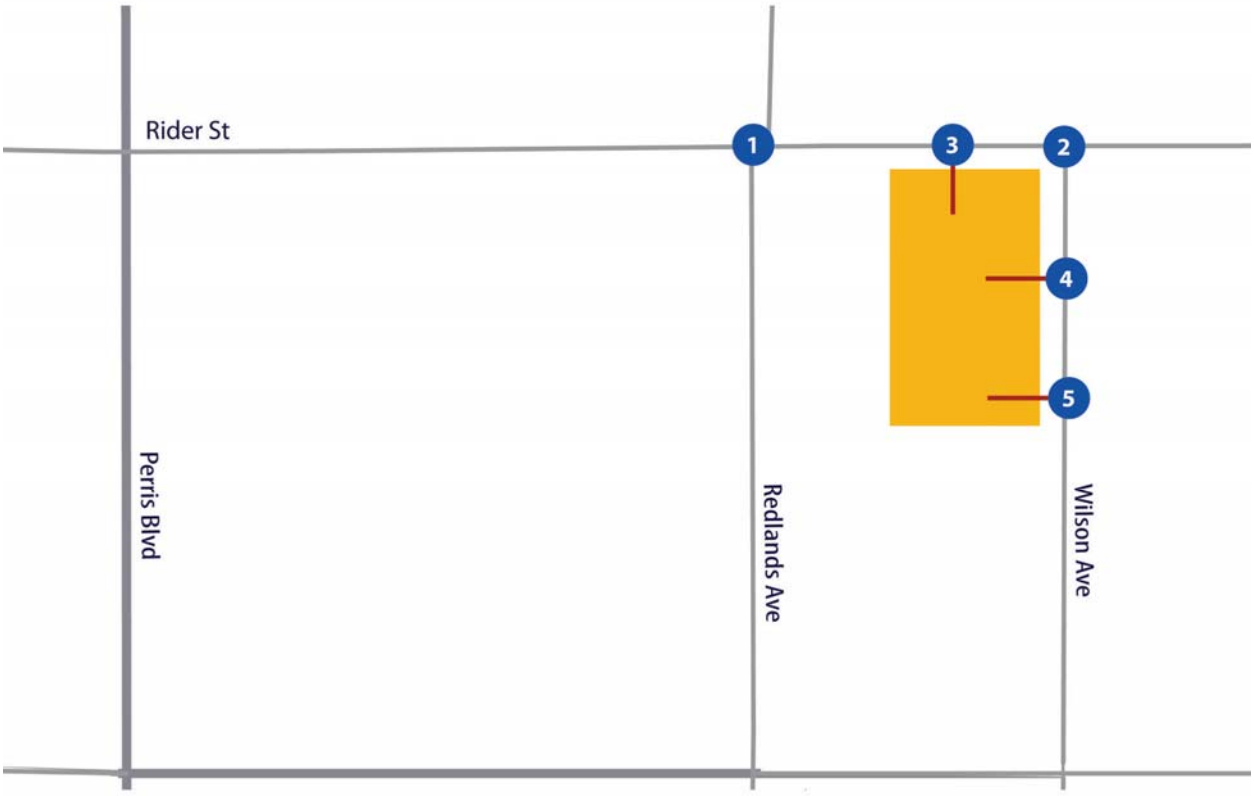


Figure 5: Existing PM Peak Hour Traffic Volumes

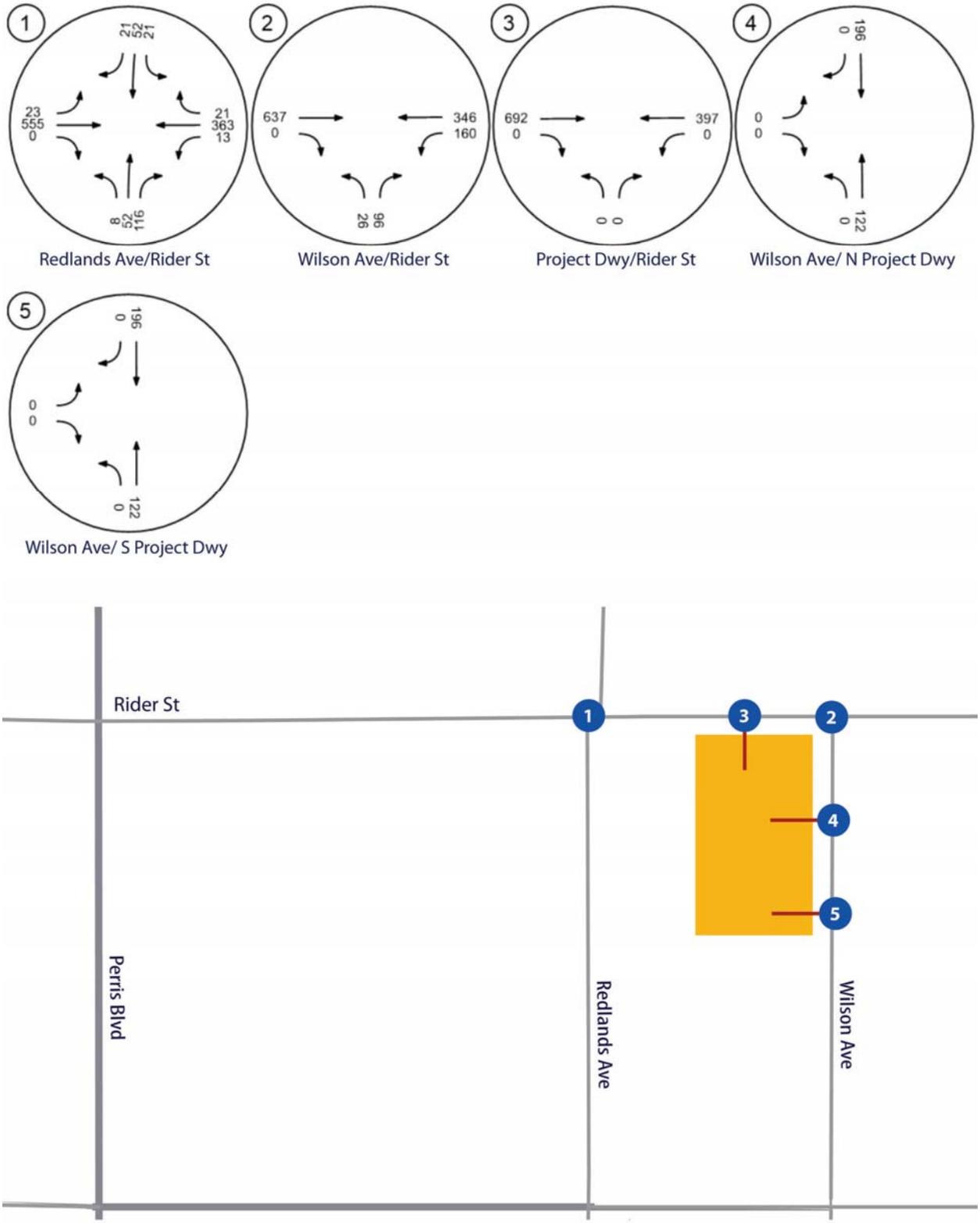


Table 3. Existing AM and PM Peak Hour Levels of Service

Intersection	Traffic Control	AM Peak		PM Peak	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. Redlands Avenue/Rider Street	Signal	13.8	B	14.0	B
2. Wilson Avenue/Rider Street	TWSC	88.3	F	41.0	E
3. Project Driveway/Rider Street	TWSC	-	-	-	-
4. Wilson Avenue/North Project Driveway	TWSC	-	-	-	-
5. Wilson Avenue/South Project Driveway	TWSC	-	-	-	-

TWSC = Two-Way Stop Controlled

AWSC = Two-Way Stop Controlled

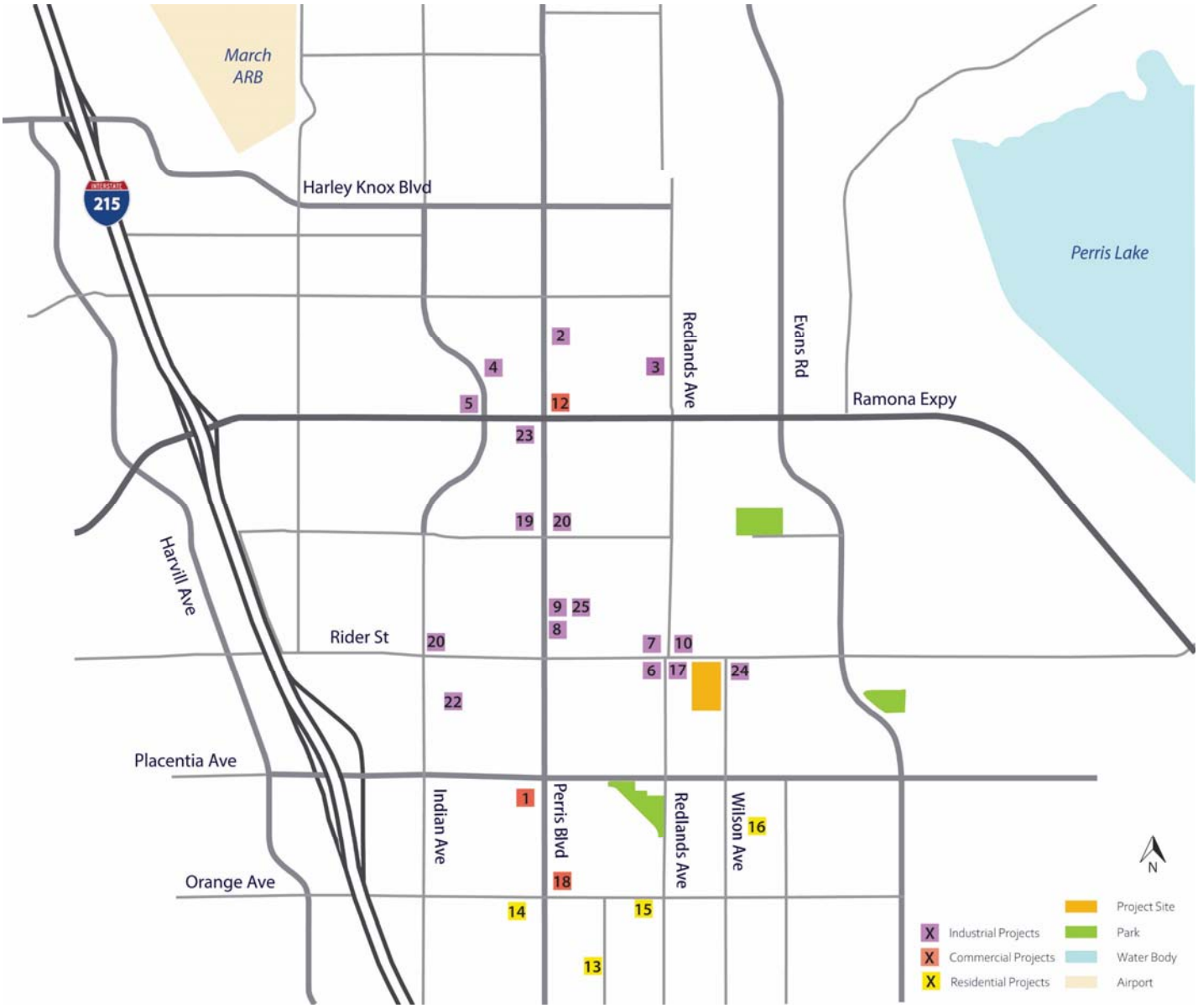
[1] Delay in Seconds

[2] Level of Service

3.3 Opening Year Baseline (2022) Traffic Volumes and LOS

Opening Year Baseline (2022) traffic volumes were developed by applying a growth rate of three percent per year to the available existing (2019) traffic volumes and adding traffic generated by other approved and pending development projects. Cumulative projects were taken from the Rider-Redlands Warehouse traffic study (19-00016) and supplemented with a current development project list provided by the City. A total of 28 projects in the vicinity of the proposed project were included in the Opening Year Baseline. The Cumulative plus Project traffic volumes were taken from the Rider-Redlands traffic study, which included 20 of the 28 projects. The remaining eight projects were manually added to the project study area. The location of the cumulative projects are shown in Figure 5 – Location of Cumulative Projects. The project trip generation for each cumulative project was calculated using trip rates from the Institute of Transportation Engineers, *Trip Generation*, 10th Edition with the exception of high-cube warehouse land use, which was calculated using the TUMF High-Cube Warehouse Trip Generation Study. Table 4 shows the trip generation for each cumulative project.

Figure 5: Location of Cumulative Projects



Note: TR33977, TR33978, TR33976 (cumulative projects of Rider-Redlands TIA 19-00016) were included in the cumulative projects trip generation but were not illustrated on the map due to unavailability of location information.

1. Cali Express Carwash
2. Duke/Perris
3. First Perry
4. Duke/Perry
5. IDI
6. Rider 1
7. Rider 3
8. Burge Industrial 1
9. Burge Industrial 2
10. Rider 2 & 4
11. First Industrial Wilson
12. Wienerschnitzel
13. TR32497
14. TR37014
15. TR34260
16. TR36797
17. First Industrial (19-00016)
18. Commercial Retail Spectrum
19. Ridge (Fallas & Hanes)
20. Wayfair
21. Whirlpool
22. Walnut Industrial
23. Expressway Industrial
24. Wilson Industrial
25. Pulliam Industrial

Table 4. Cumulative Projects Trip Generation

				AM Peak Hour			PM Peak Hour		
Land Use	**ITE Code**	**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates									
High-Cube Warehouse/Distribution Center[1]	154	TSF	2.13	0.09	0.03	0.12	0.05	0.12	0.17
Warehouse[2]	150	TSF	1.74	0.13	0.04	0.17	0.05	0.14	0.19
Manufacturing	140	TSF	3.93	0.48	0.14	0.62	0.21	0.46	0.67
Shopping Center	820	TSF	37.75	0.58	0.36	0.94	1.83	1.98	3.81
Fast Food w/ Drive Through	934	TSF	470.95	20.50	19.69	40.19	16.99	15.68	32.67
Automated Car Wash		TSF					7.10	7.10	14.20
Single-Family Housing	210	DU	9.34	0.19	0.56	0.74	0.62	0.37	0.99
Multi-Family Housing	220	DU	7.32	0.21	0.25	0.46	0.35	0.21	0.56
Projects from 19-00016 TIA Study									
Cali Express Carwash	5.6	TSF	800			0			80
Duke/Perris	1070	TSF	1498			86			107
First Perry	420	TSF	336			19			24
Duke/Perry	144	TSF	251			24			27
IDI	426	TSF	596			34			43
Rider 1	350	TSF	490			28			35
Rider 3	640	TSF	896			51			64
Burge Industrial 1	18	TSF	71			11			12
Burge Industrial 2	19	TSF	75			12			13
Rider 2 & 4	1373	TSF	1922			110			137
First Industrial Wilson	320	TSF	790			77			77
Weinerschnitzel	2	TSF	942			80			65
TR32497	131	TSF	1237			97			130
TR37014	202	TSF	1479			93			113
TR34260	22	TSF	208			16			22
TR36797	76	TSF	717			56			75
TR33977	340	TSF	3210			252			337
TR33978	139	TSF	1312			103			138
TR33976	207	TSF	1515			95			116
Total			**18345**			**1244**			**1615**
First Industrial Warehouse Project (19-00016)	324	TSF	844	62	22	84	23	60	83
Projects Added to Study Area									
Commercial Retail Spectrum	7	TSF	279	4	3	7	9	10	19
Ridge (Fallas & Hanes)[1] Total PCE[3]	1900	TSF	5306	227	65	292	111	275	386
Wayfair (Duke 1)[1] Total PCE[3]	2000	TSF	5585	239	67	306	116	290	406
Whirlpool (IDS)[1] Total PCE[3]	1700	TSF	4747	203	61	264	102	245	346
Walnut indus[1] Total PCE[3]	205	TSF	572	25	5	30	11	29	40
Expressway Indus[1] Total PCE[3]	347	TSF	969	42	12	54	20	50	70

Table 4. Cumulative Projects Trip Generation (continued)

Land Use	ITE Code		Units	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Wilson Indus[1]										
Total PCE[3]	303	TSF		846	37	11	48	18	44	62
Pulliam Indus[2]										
Total PCE[3]	16	TSF		80	10	3	13	3	11	14
Total Cumulative Trip Generation				**37574**			**2343**			**3041**

TSF = Thousand Square Feet

PCE = Passenger Car Equivalent

[1] Trip rates and truck percentages from the TUMF High-Cube Warehouse Trip Generation Study, January 29, 2019. Rate used is for Fulfillment Center. Primary vehicle mix from TUMF High-Cube Warehouse Trip Generation Study. 2, 3 and 4 axle trucks were split as follows: 50% 4-axle, 33.3% 3-axle, and 16.7% 4-axle.

[2] Vehicle Mix from the City of Fontana, Truck Trip Generation Study, August 2003. Classification: Heavy Warehouse.

[3] Passenger Car Equivalent (PCE) factors from San Bernardino County CMP, Appendix B - Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County, 2016

The traffic volumes generated by the cumulative projects were distributed to the study area intersections using the manual distribution method. The distribution used for each cumulative project was determined based on the location of the project in relation to the study area, as well as logical paths of travel to and from each cumulative project site. The cumulative AM and PM traffic volumes of the supplemental eight projects are illustrated in Figure 6 and Figure 7 respectively. As noted in Section 2.2 – Study Area and Analysis Scenarios, forecast traffic volumes for the Cumulative Baseline condition were developed by applying a growth rate of three percent per year to the available 2019 traffic counts and adding traffic from cumulative projects. Opening Year Baseline AM and PM peak hour traffic volumes are shown on Figure 8 and Figure 9 respectively.

The Cumulative Baseline levels of service (LOS) at the five study area intersections were determined using the HCM methodology, described previously in Section 2.3 - Methodology. Table 5 shows the Cumulative Baseline AM and PM peak hour levels of service at study intersections. As shown in Table 5, all of the intersections are forecast to operate at satisfactory LOS D or better in the Opening Year Baseline condition except for the intersection of Wilson Avenue/Rider Street which operates at LOS F both in the AM and PM peak hour.

Table 5. Opening Year Baseline AM and PM Peak Hour Levels of Service

Intersection	Traffic Control	AM Peak Delay[1]	AM Peak LOS[2]	PM Peak Delay[1]	PM Peak LOS[2]
1. Redlands Avenue/Rider Street	Signal	15.6	B	28.9	C
2. Wilson Avenue/Rider Street	TWSC	128.3	F	105.3	F
3. Project Driveway/Rider Street	TWSC	-	-	-	-
4. Wilson Avenue/North Project Driveway	TWSC	-	-	-	-
5. Wilson Avenue/South Project Driveway	TWSC	-	-	-	-

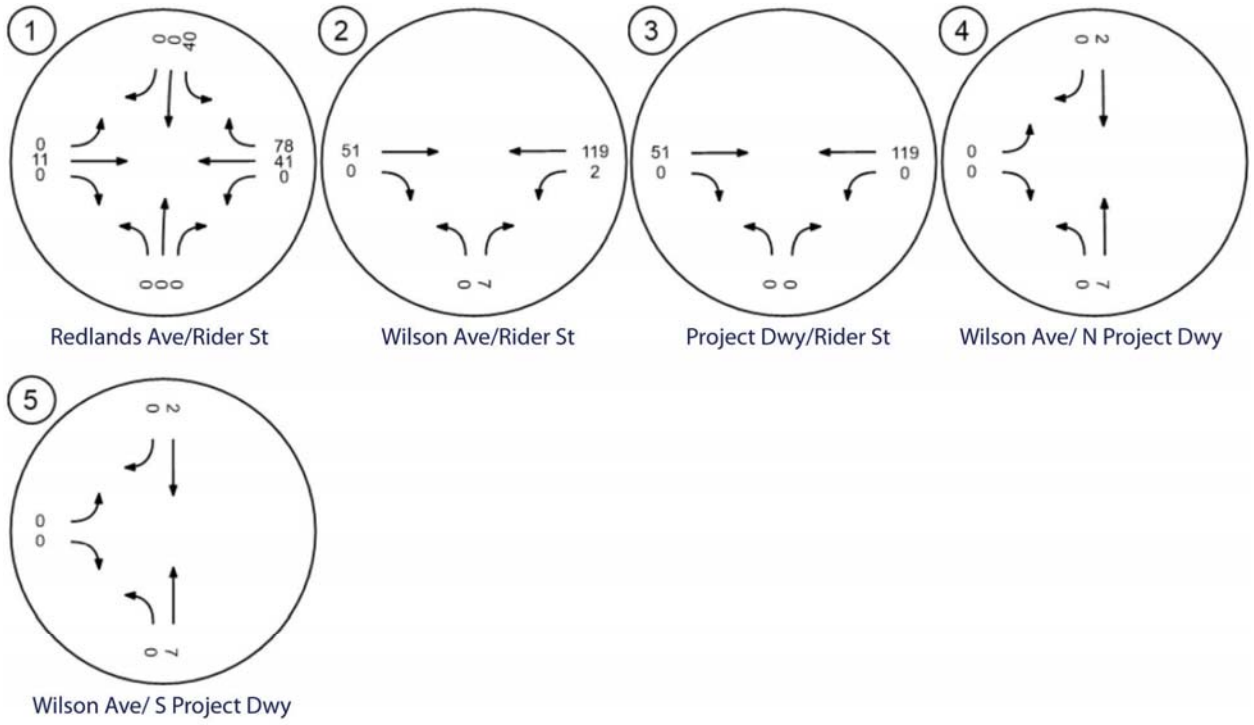
TWSC = Two-Way Stop Controlled

AWSC = Two-Way Stop Controlled

[1] Delay in Seconds

[2] Level of Service

Figure 6: Cumulative AM Projects Trip Assignment



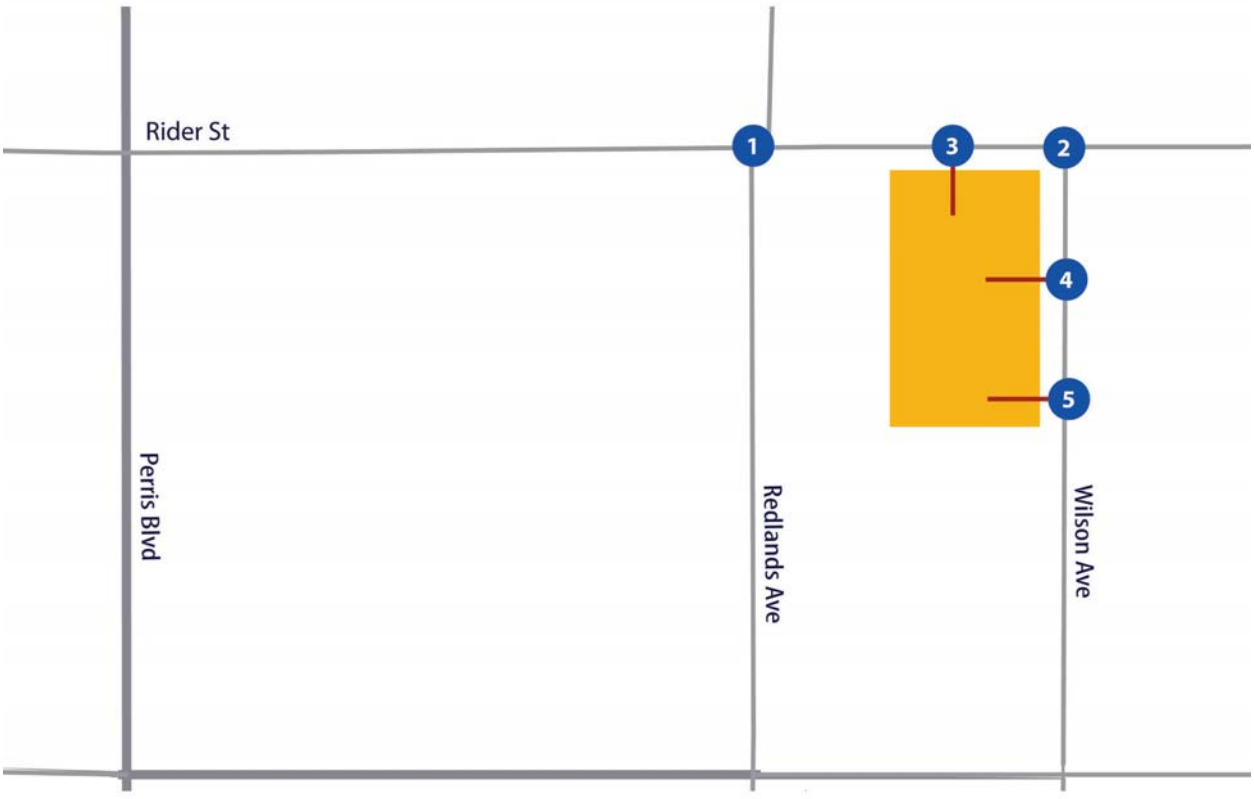
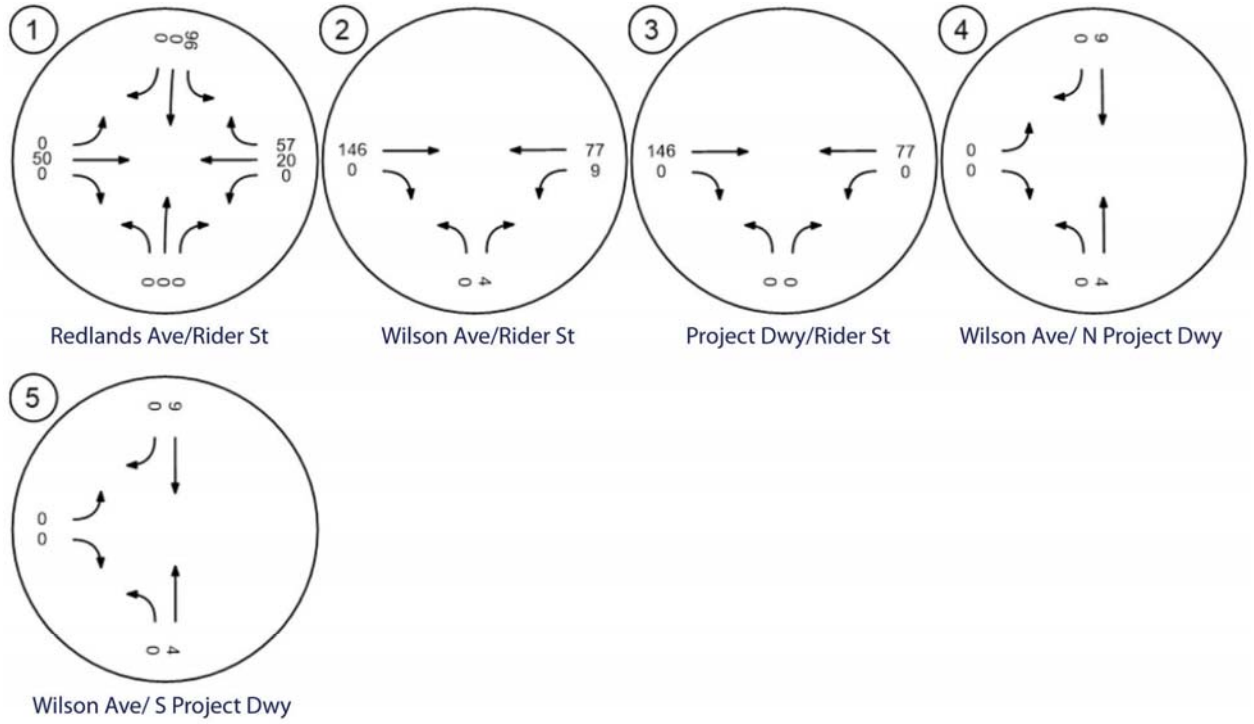


Figure 7: Cumulative PM Projects Trip Assignment



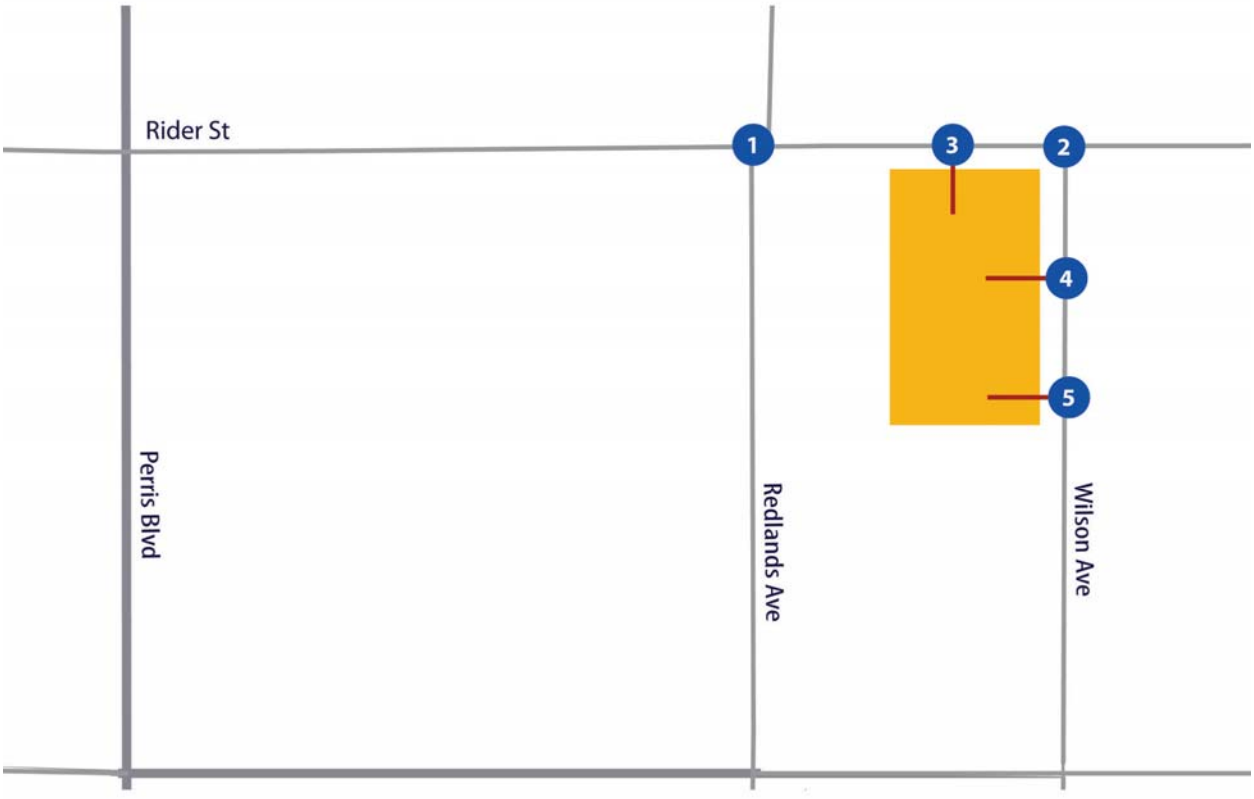
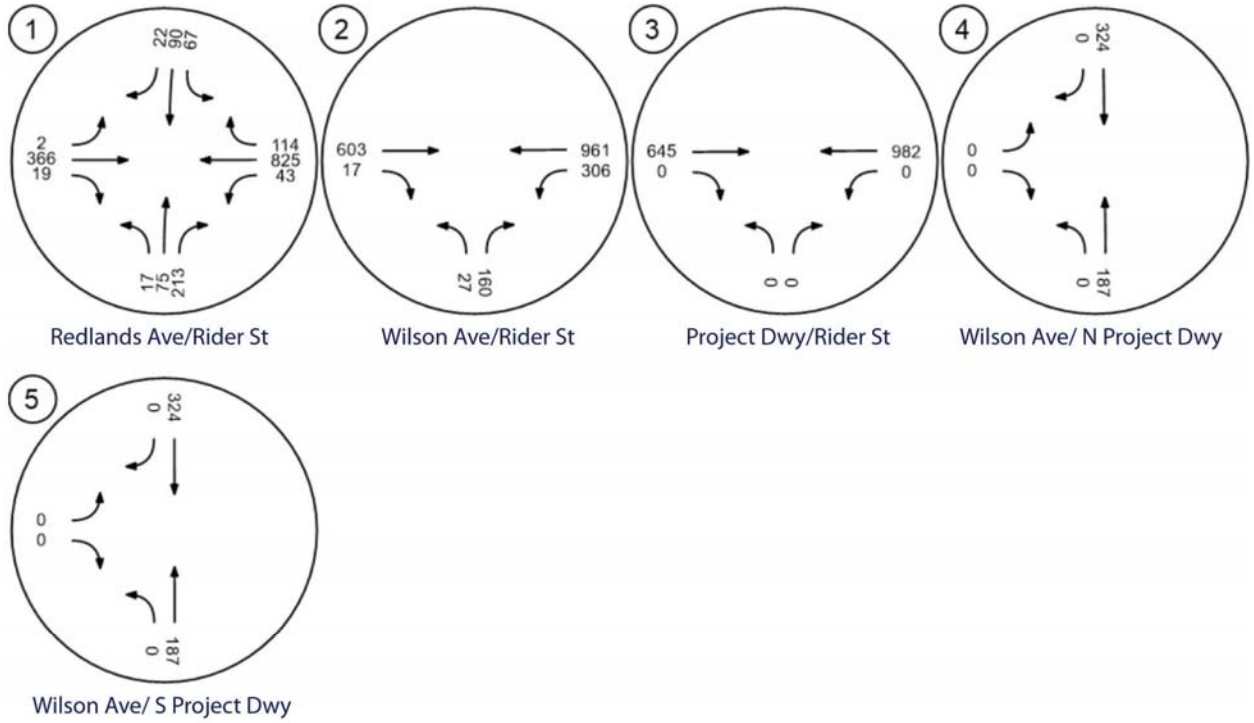


Figure 8: Opening Year AM Peak Hour Traffic Volumes



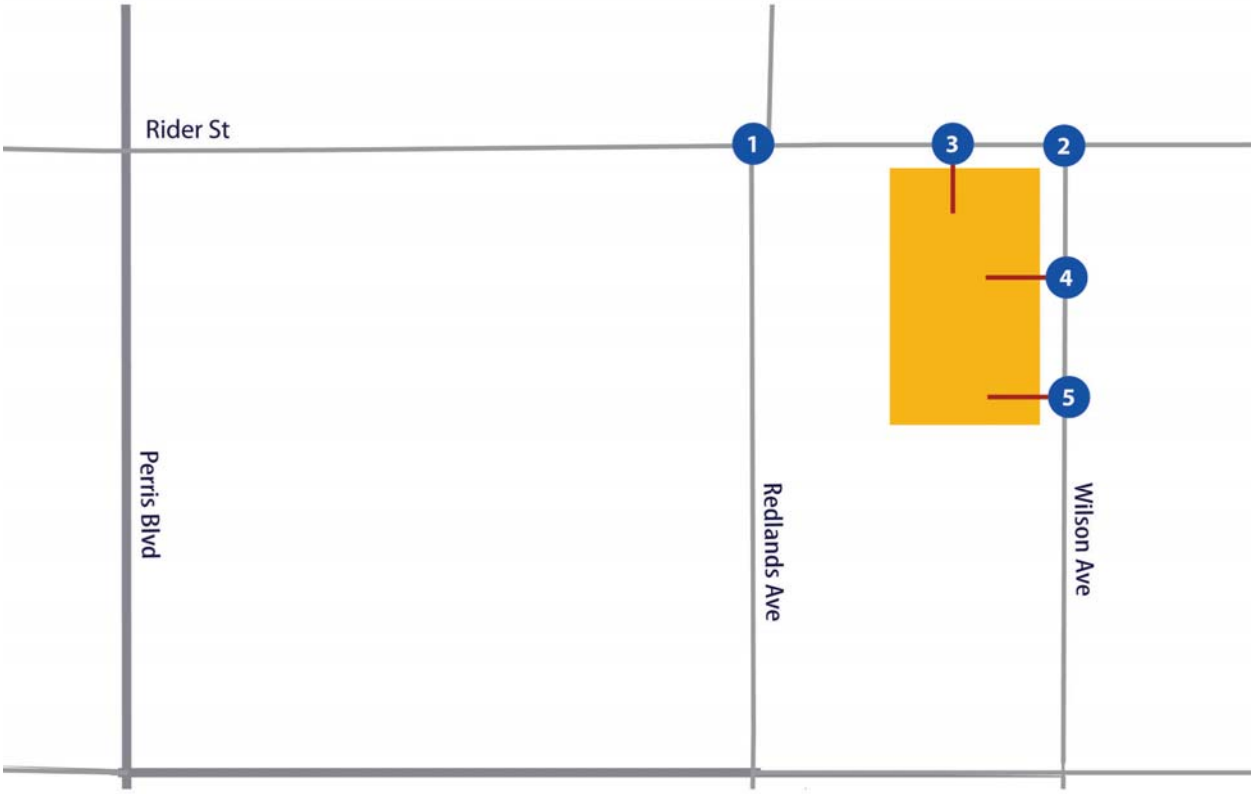
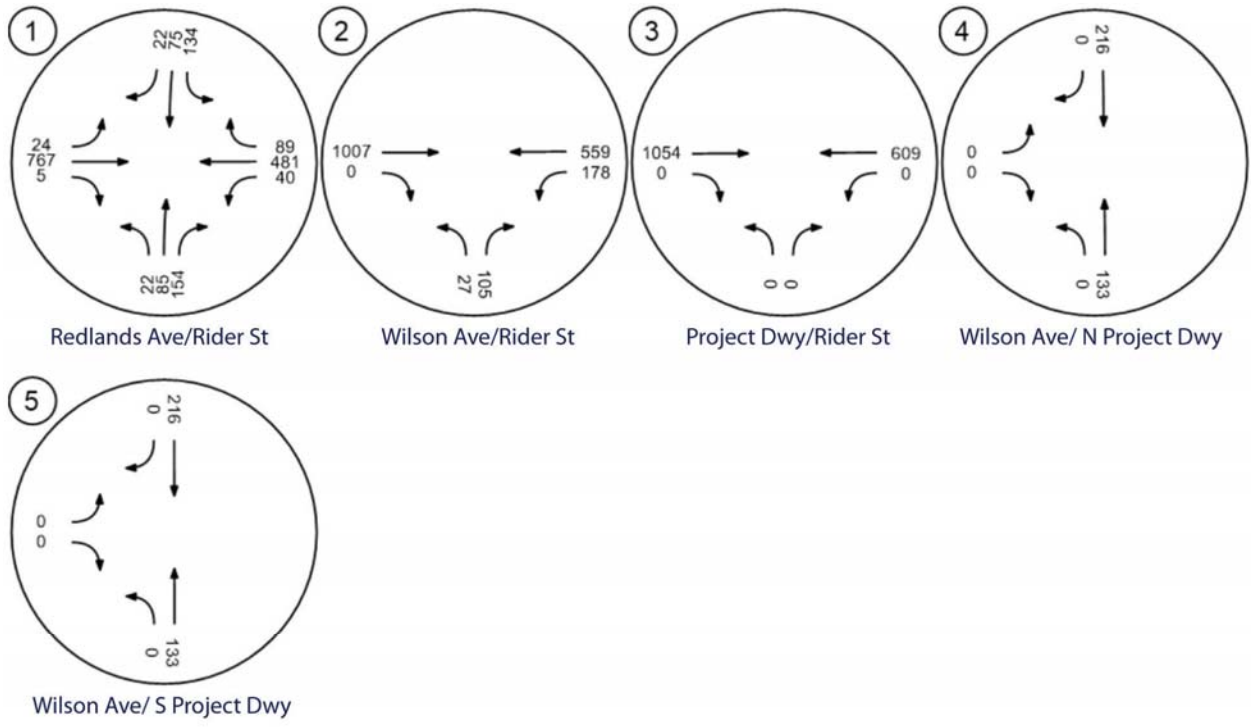
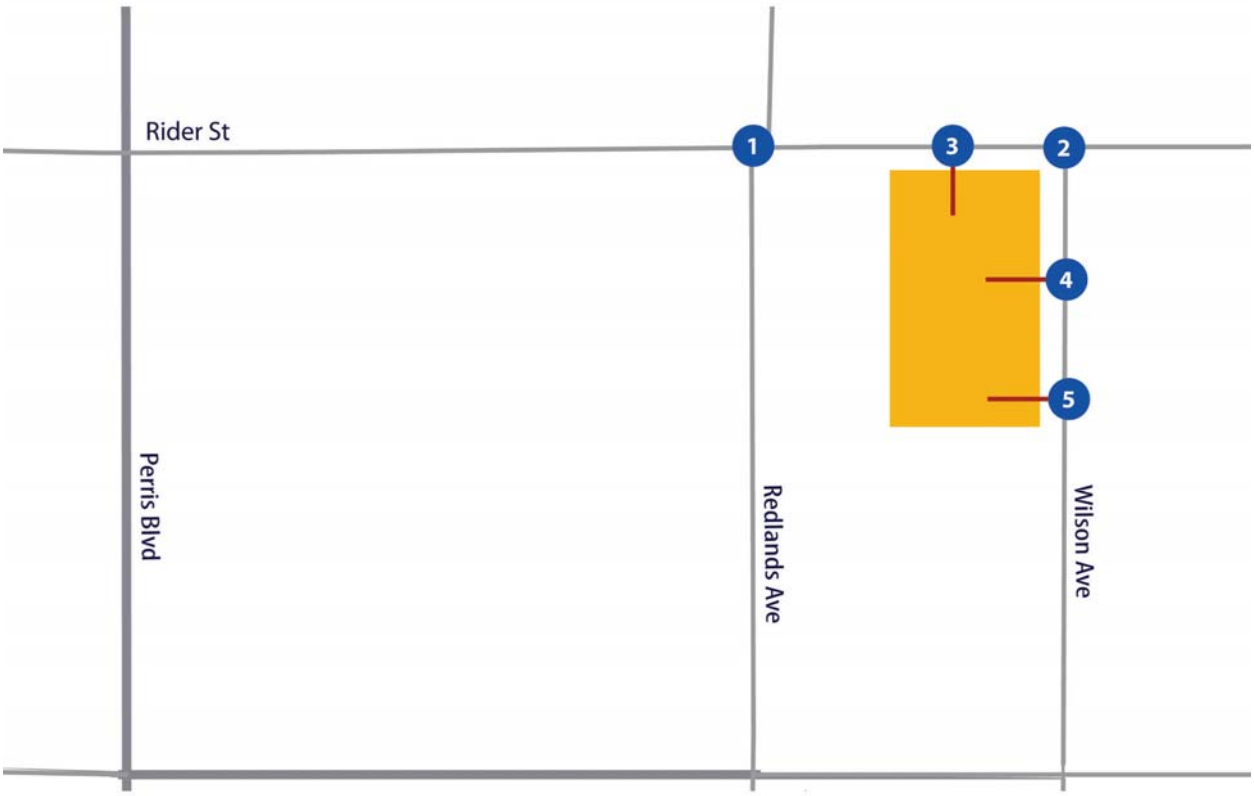


Figure 9: Opening Year PM Peak Hour Traffic Volumes





4 PROPOSED PROJECT

4.1 Project Description and Project Access

As described in Section 2.1 – Project Description, the project proposes to construct a 248,442 square-foot High Cube Warehouse Building that would operate 7 days a week 24 hours a day. The site is mostly vacant except three large-lot, single-family residences.

4.2 Project Trip Generation

Vehicle trips were generated for the project using trip rates from the Institute of Transportation Engineers (ITE) *Trip Generation* (10th Edition, 2017). The trip generation is broken out by vehicle type and passenger car equivalent (PCE) factors are applied to the truck trips to determine the PCE trip generation. Passenger car equivalent factors account for the additional roadway capacity utilized by trucks due to their larger size, slower acceleration and reduced maneuverability when compared to passenger cars. The project trip generation is shown in Table 6. The project would generate 694 daily PCE trips, including 38 AM peak hour PCE trips and 50 PM peak hour PCE trips.

4.3 Project Trip Distribution and Assignment

Project trips were distributed to the study area intersections based on the location of the project and logical routes of travel to and from the site. Project trips were assigned to the study area intersections by multiplying the net project trip generation by the trip distribution percent at each location. The project trip distribution for Existing conditions (for automobiles and trucks) is shown in Figures 10. The project automobile trip assignment for Existing conditions for AM and PM peak hours are shown in Figure 11 and 12 respectively. The project truck trip assignment for AM and PM peak hours are shown in Figure 13 and 14 respectively. The total project trip assignment (automobile and truck combined) for AM and PM peak hours are shown in Figure 15 and 16 respectively.

Construction of the planned Placentia Avenue interchange at I-215 will be completed by the project opening year. Therefore, automobiles and trucks are assumed to utilize the Placentia Avenue Interchange for the Opening Year trip distribution. The project distribution for Opening Year conditions (for automobiles and trucks) is shown in Figures 17. The project automobile trip assignment for Opening Year conditions for AM and PM peak hours are shown in Figure 18 and 19 respectively. The project truck trip assignment for AM and PM peak hours are shown in Figure 20 and 21 respectively. The total project trip assignment (automobile and truck combined) for AM and PM peak hours are shown in Figure 22 and 23 respectively.

Table 6. Project Trip Generation

Table 1. Rider Assemblage Trip Generation

				AM Peak Hour			PM Peak Hour		
Land Use		**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates									
TUMF Fulfillment Center Rates[1]		TSF	2.129	0.094	0.028	0.122	0.046	0.119	0.165
Total Vehicle Trip Generation									
Wilson/Rider Warehouse	248.442	TSF	529	23	7	30	11	30	41
Vehicle Mix [1]	***% AM***	***% PM***							
Passenger Vehicles	84.4%	87.3%	435	20	6	26	10	26	36
2- Axle Trucks	1.1%	1.1%	7	0	0	0	0	0	0
3-Axle Trucks	2.2%	2.2%	13	0	0	0	0	1	1
4-Axle Trucks	3.3%	3.3%	20	1	0	1	0	1	1
5+-Axle Trucks	9.0%	6.1%	54	2	1	3	1	2	3
	100.00%	100.00%	529	23	7	30	11	30	41
PCE Trip Generation2		***PCE Factor***							
Passenger Vehicles		1.0	435	20	6	26	10	26	36
2- Axle Trucks		1.5	10	0	0	0	0	0	0
3-Axle Trucks		2.0	27	0	0	0	0	2	2
4-Axle Trucks		3.0	60	3	0	3	0	3	3
5+-Axle Trucks		3.0	162	6	3	9	3	6	9
Total PCE Trip Generation			694	29	9	38	13	37	50

TSF = Thousand Square Feet

PCE = Passenger Car Equivalent

[1] Trip rates and truck percentages from the TUMF High-Cube Warehouse Trip Generation Study, January 29, 2019. Rate used is for Fulfillment Center. 2, 3 and 4 axle trucks were split as follows: 50% 4-axle, 33.3% 3-axle, and 16.7% 4-axle.

[2] Passenger Car Equivalent (PCE) factors from San Bernardino County CMP, Appendix B - Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County, 2016

Figure 10: Existing Conditions Project Trip Distribution

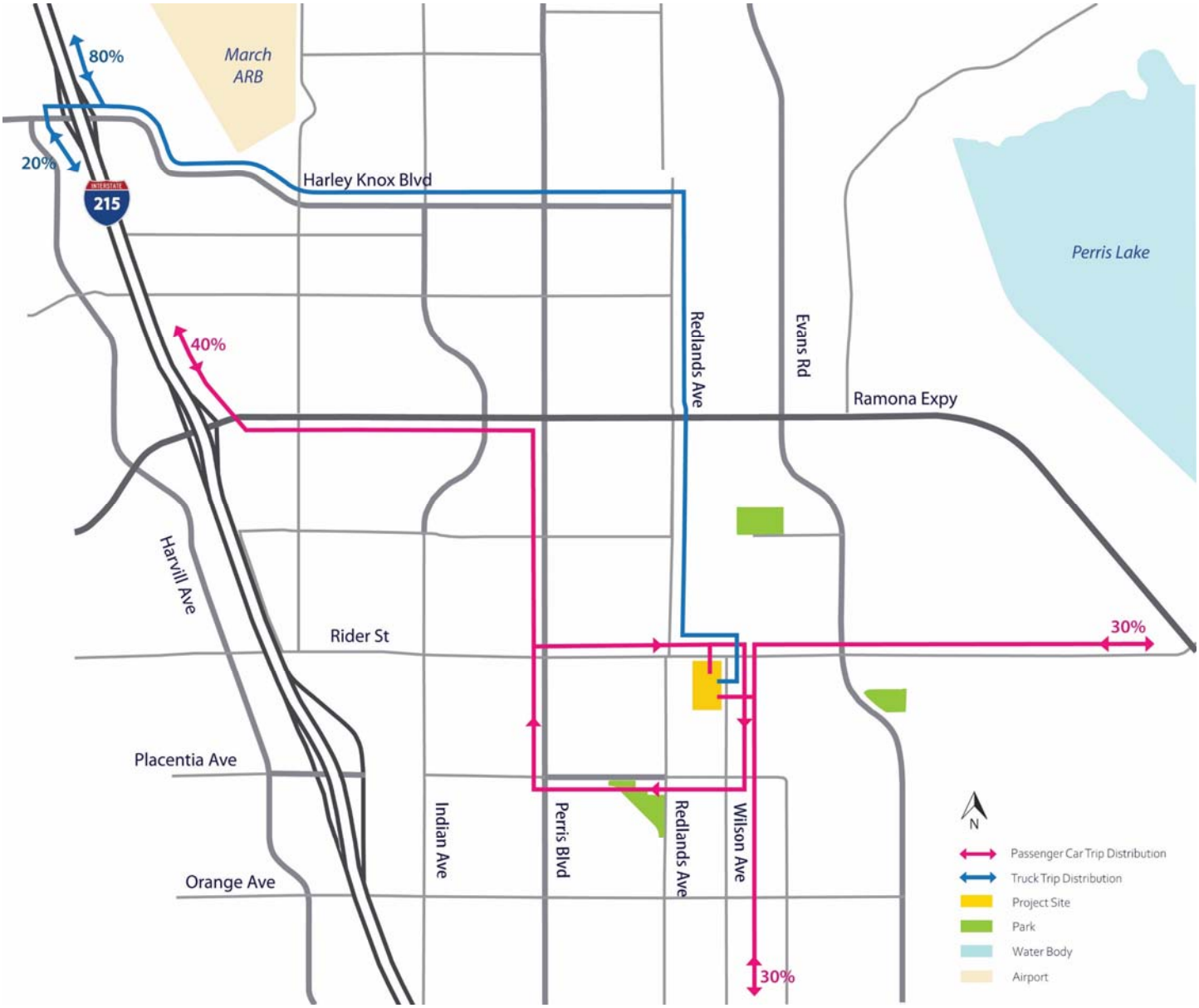
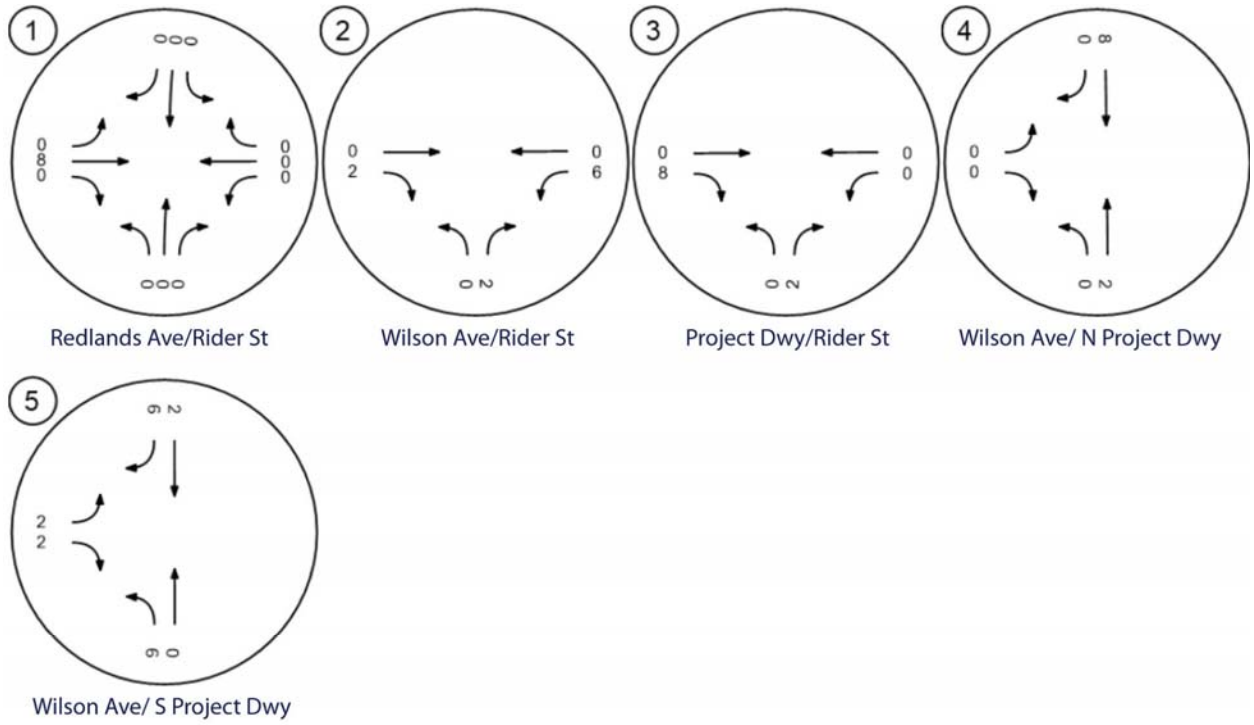


Figure 11: Existing Project Automobile Trips AM



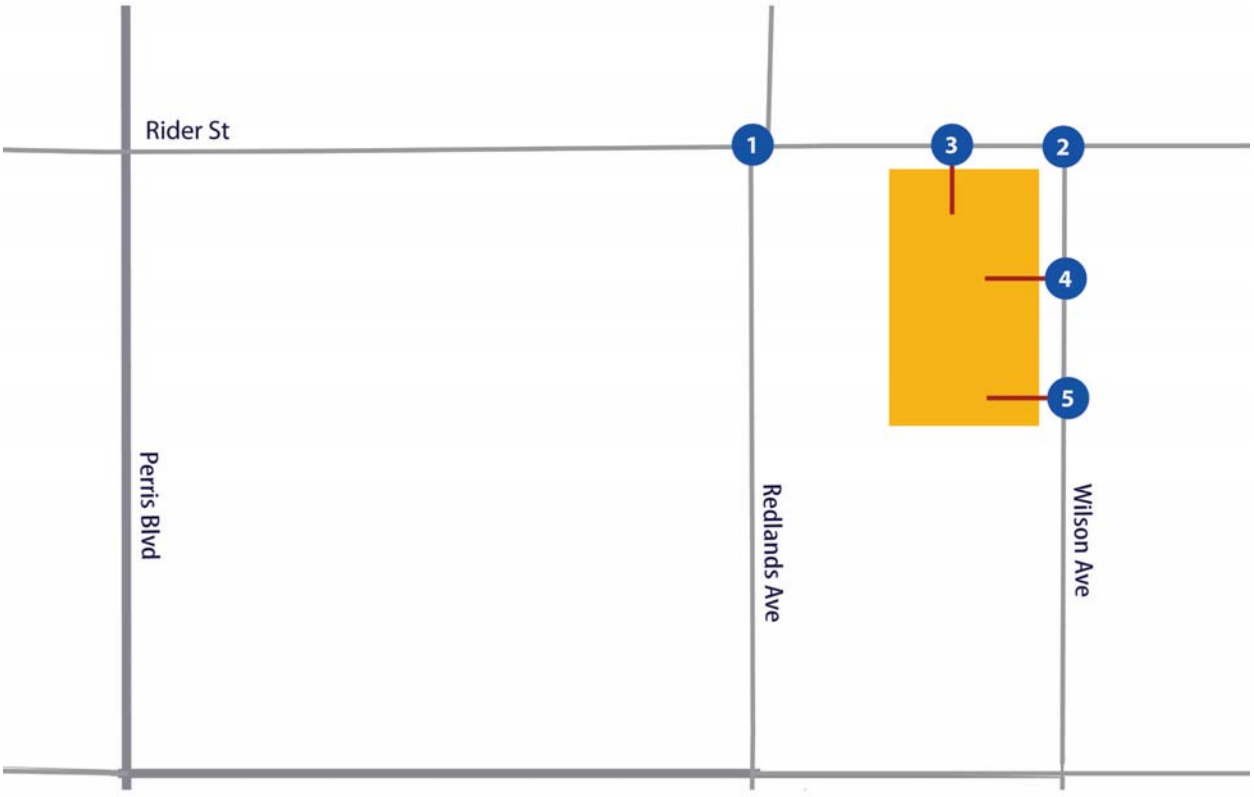
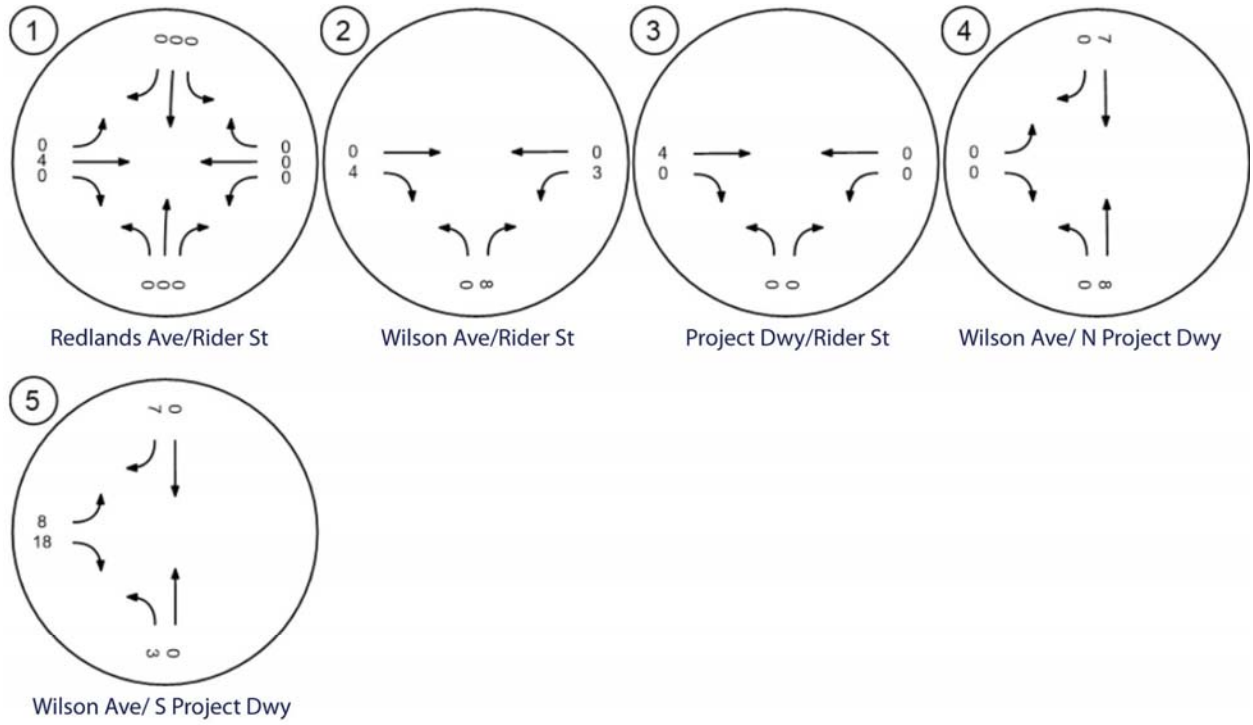


Figure 12: Existing Project Automobile Trips PM



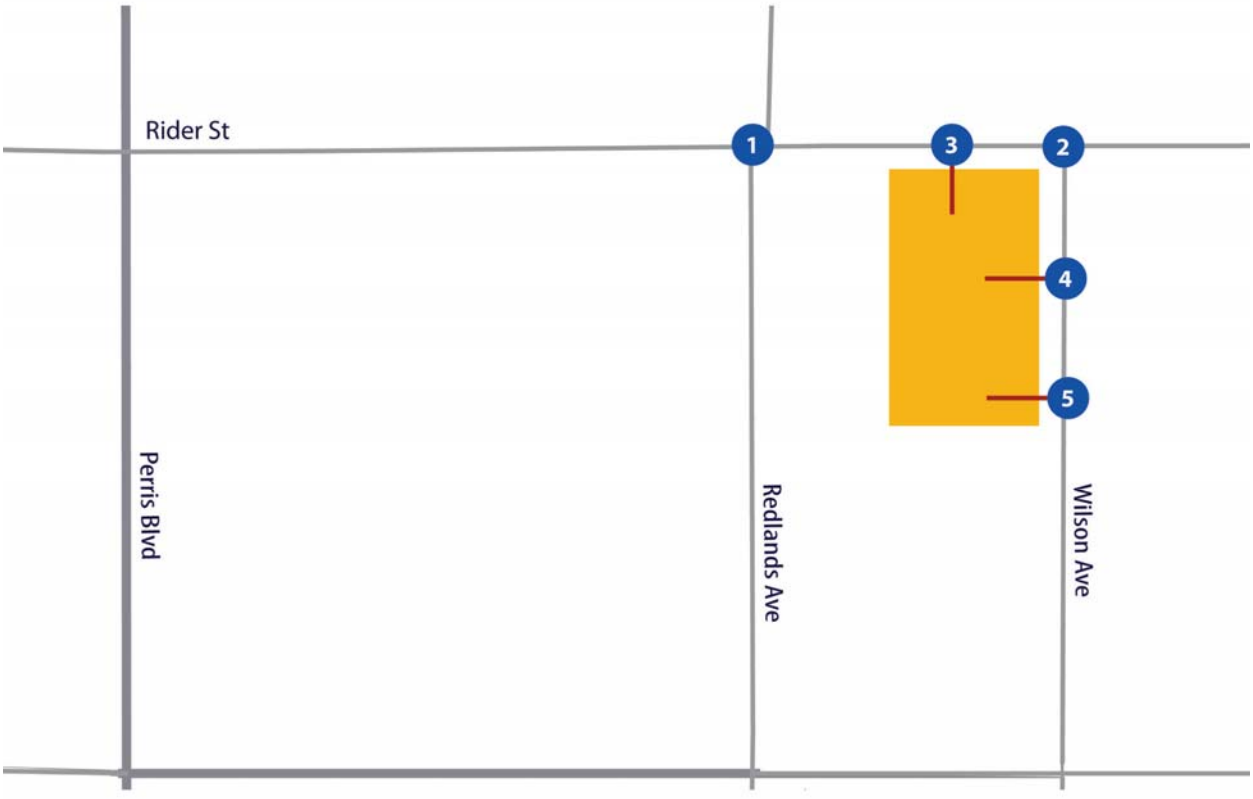
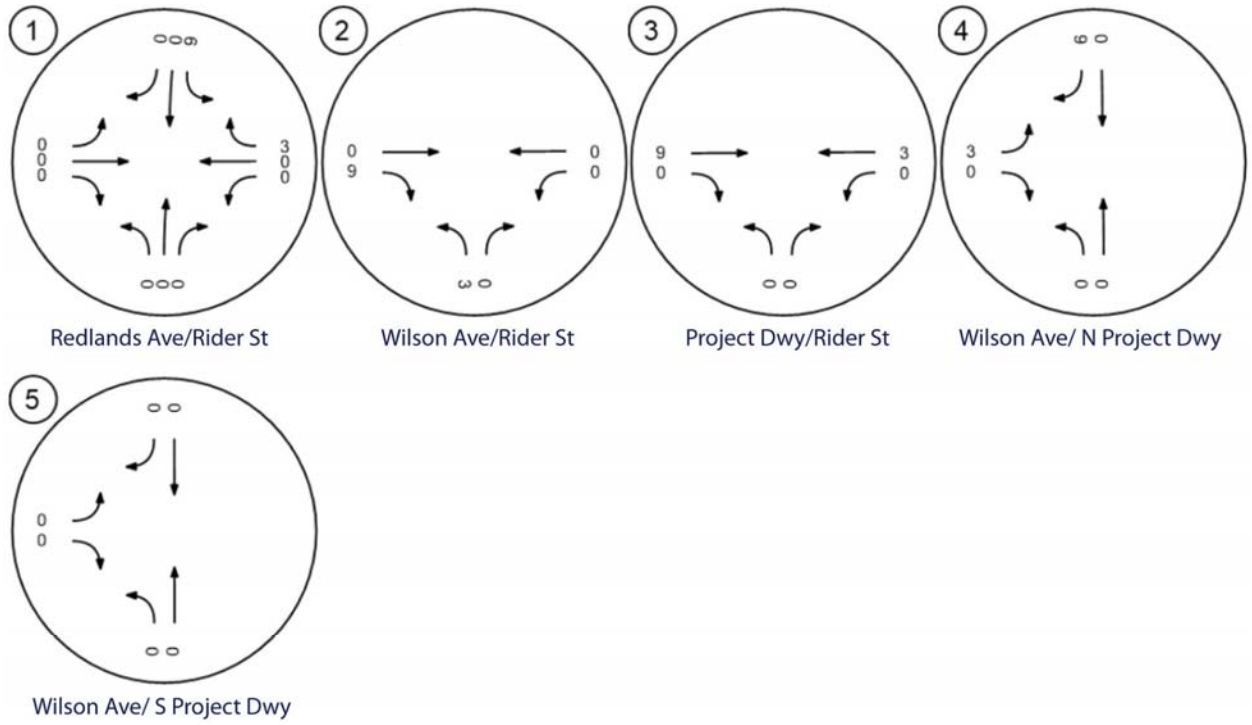


Figure 13: Existing Project Truck trips AM



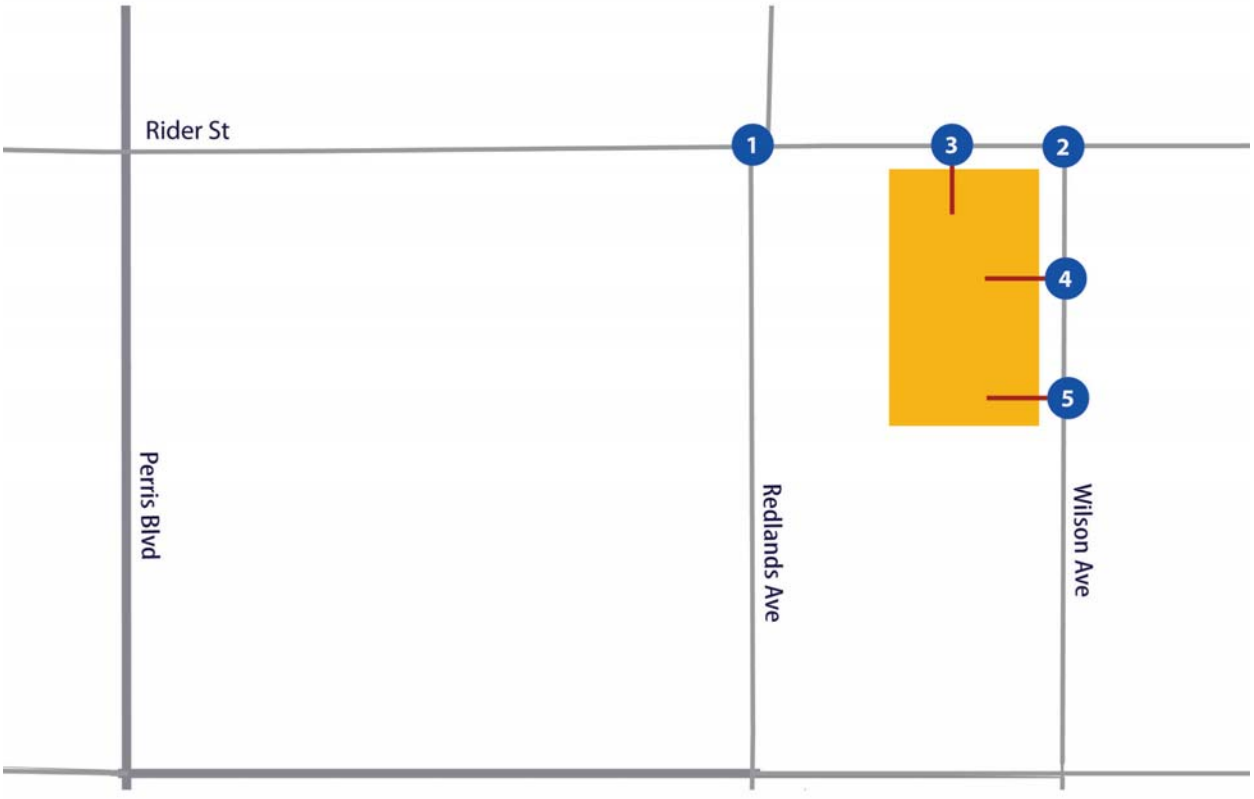
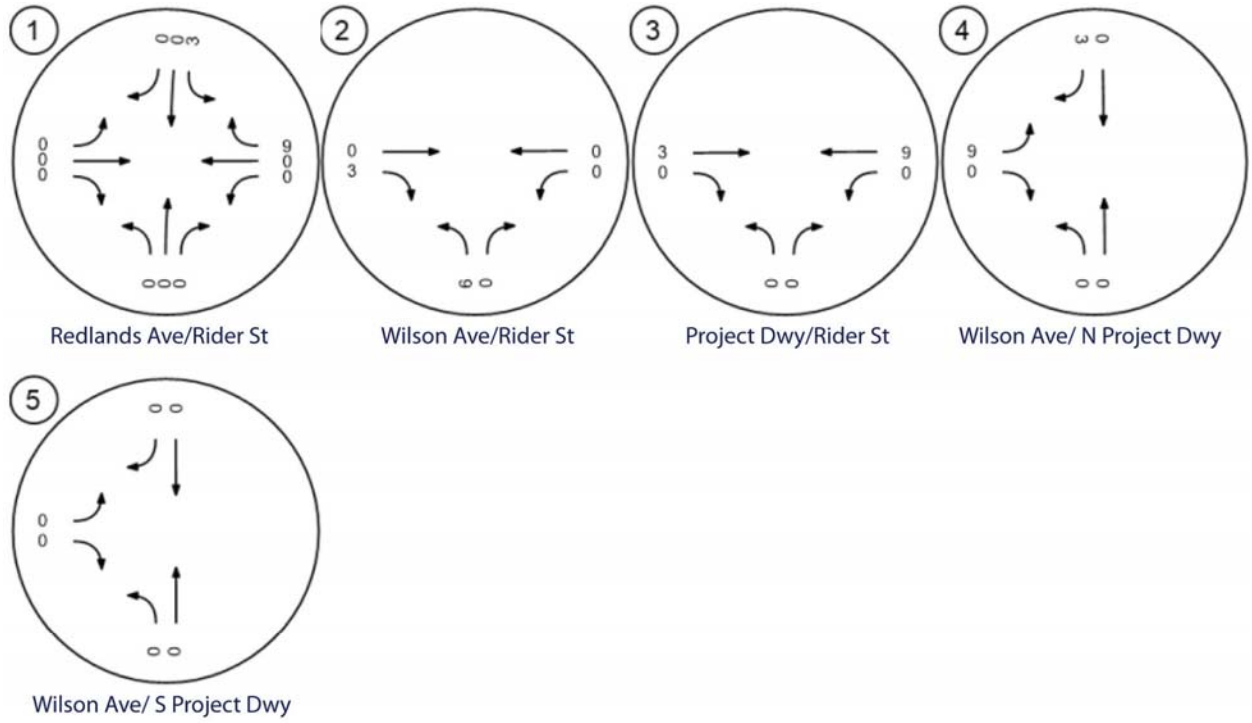


Figure 14: Existing Project Truck trips PM



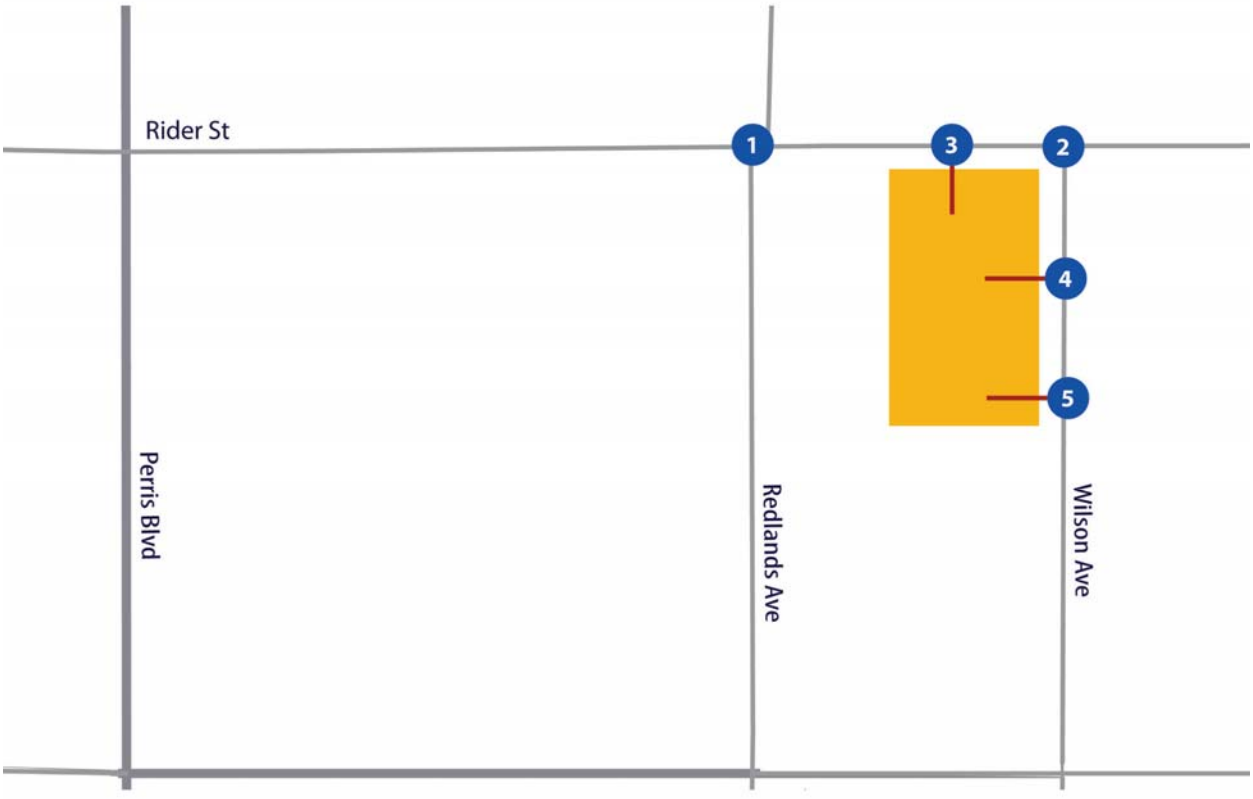
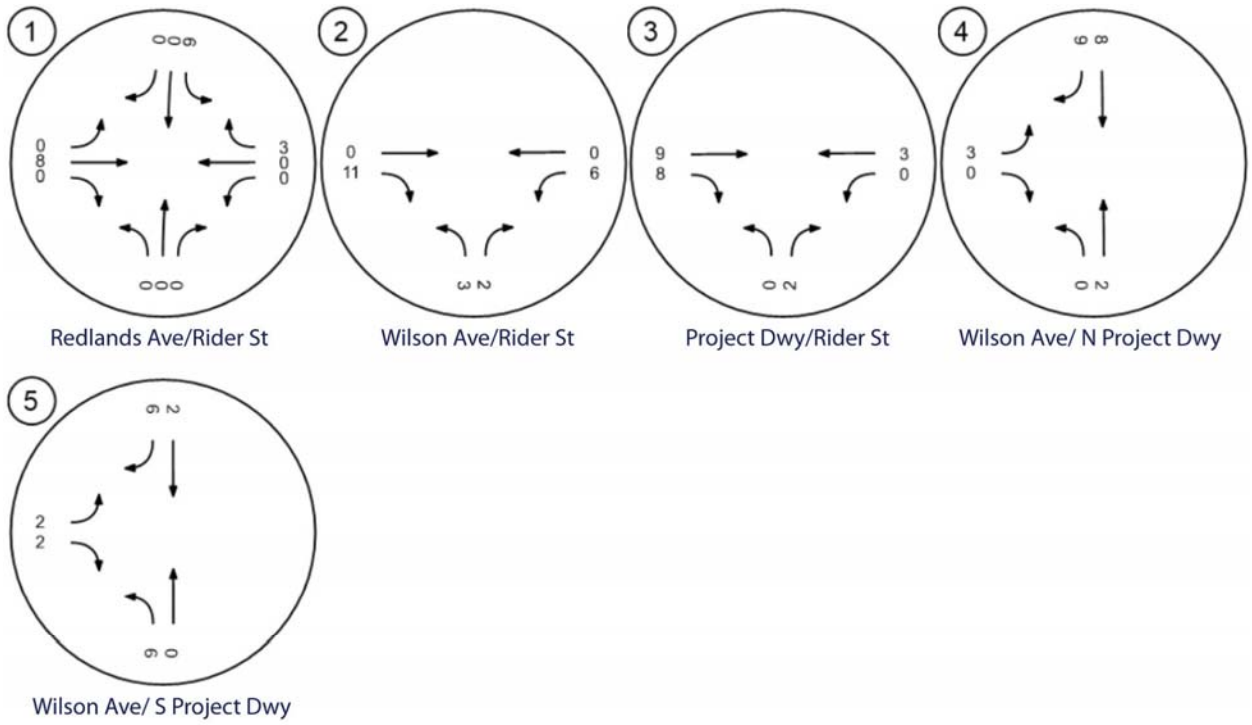


Figure 15: Existing Total Project Trips AM



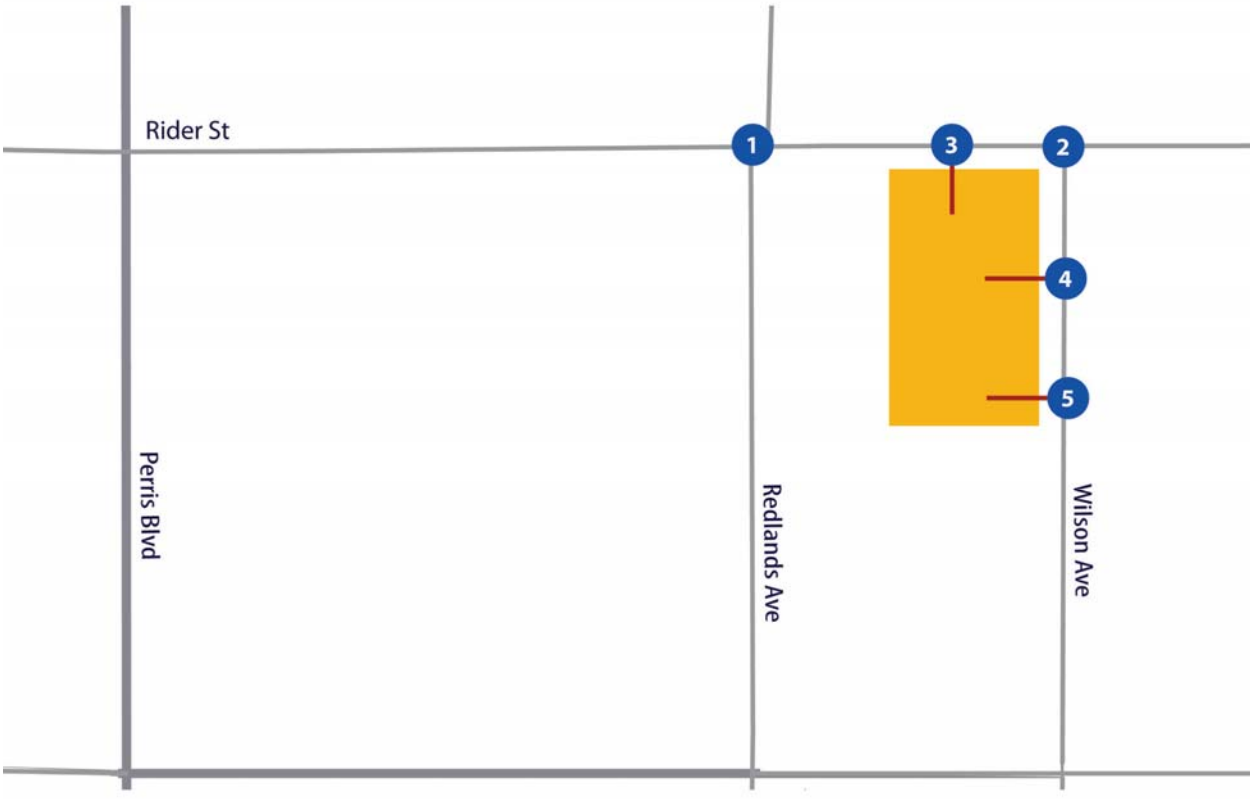
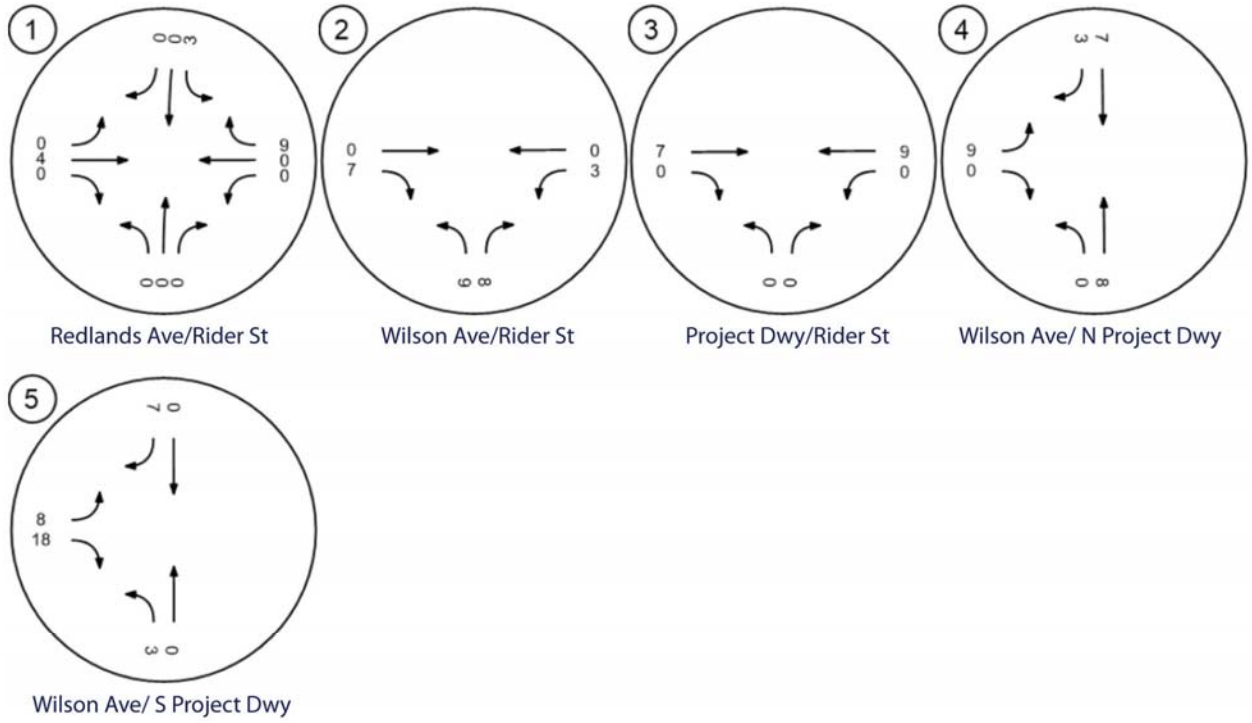


Figure 16: Existing Total Project Trips PM



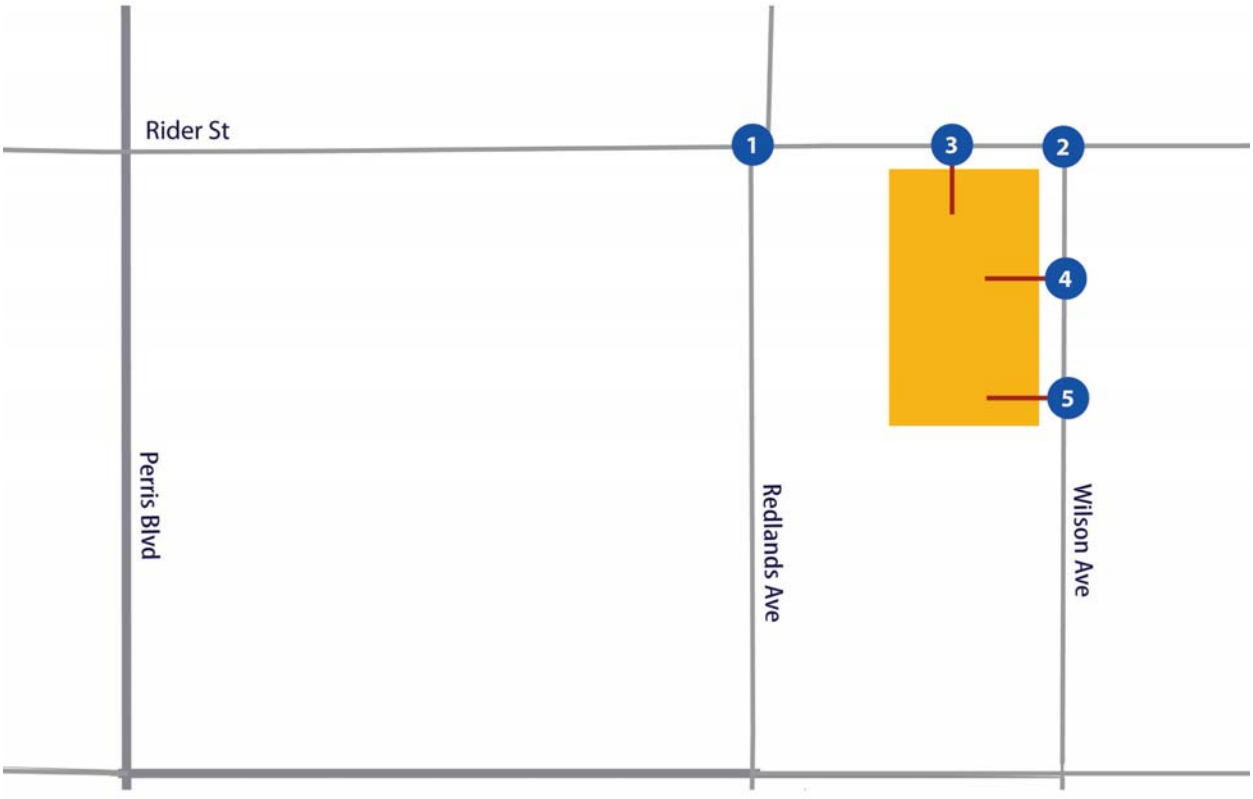


Figure 17: Opening Year Project Trip Distribution

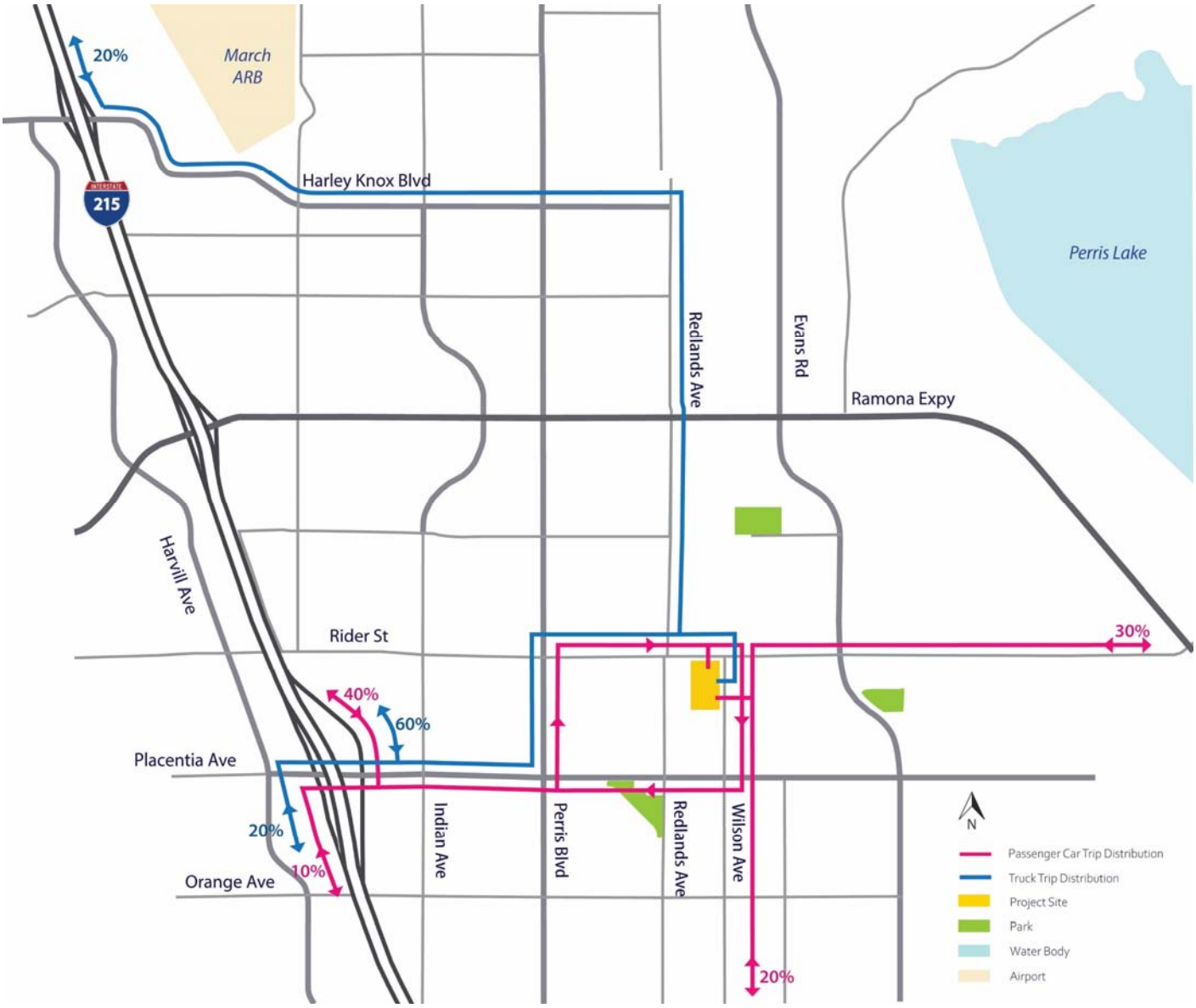
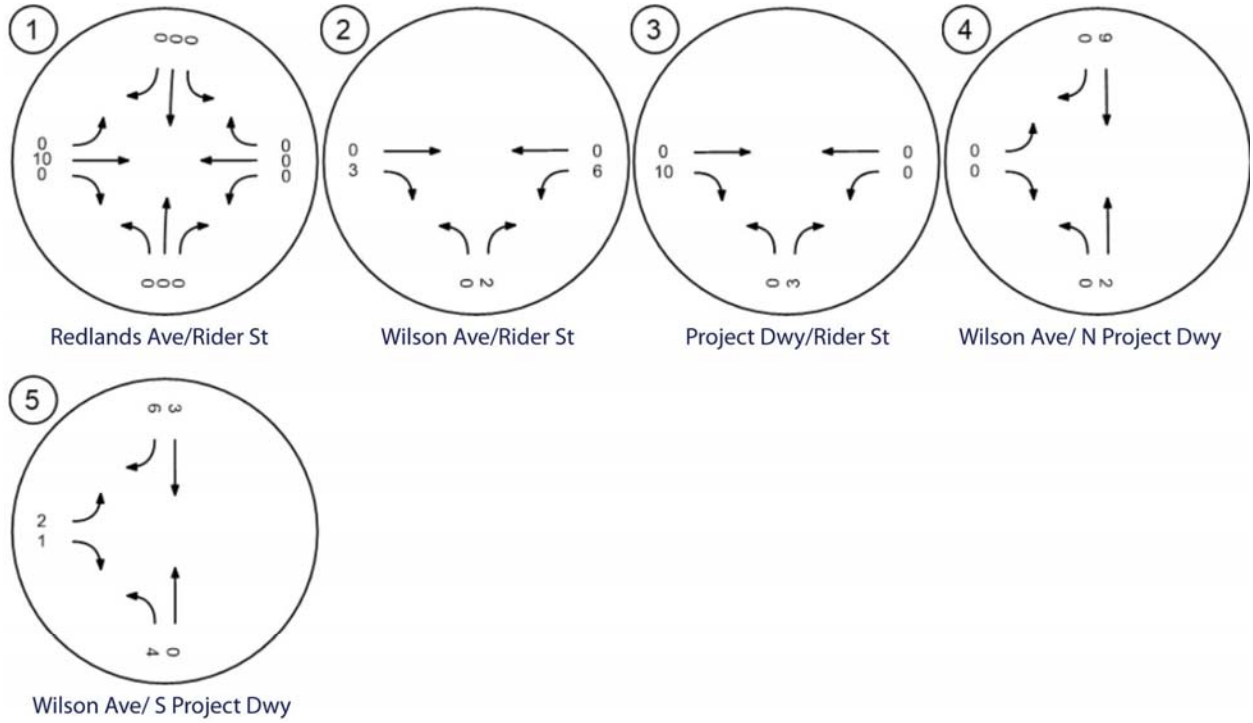


Figure 18: Opening Year AM Project Auto Trips



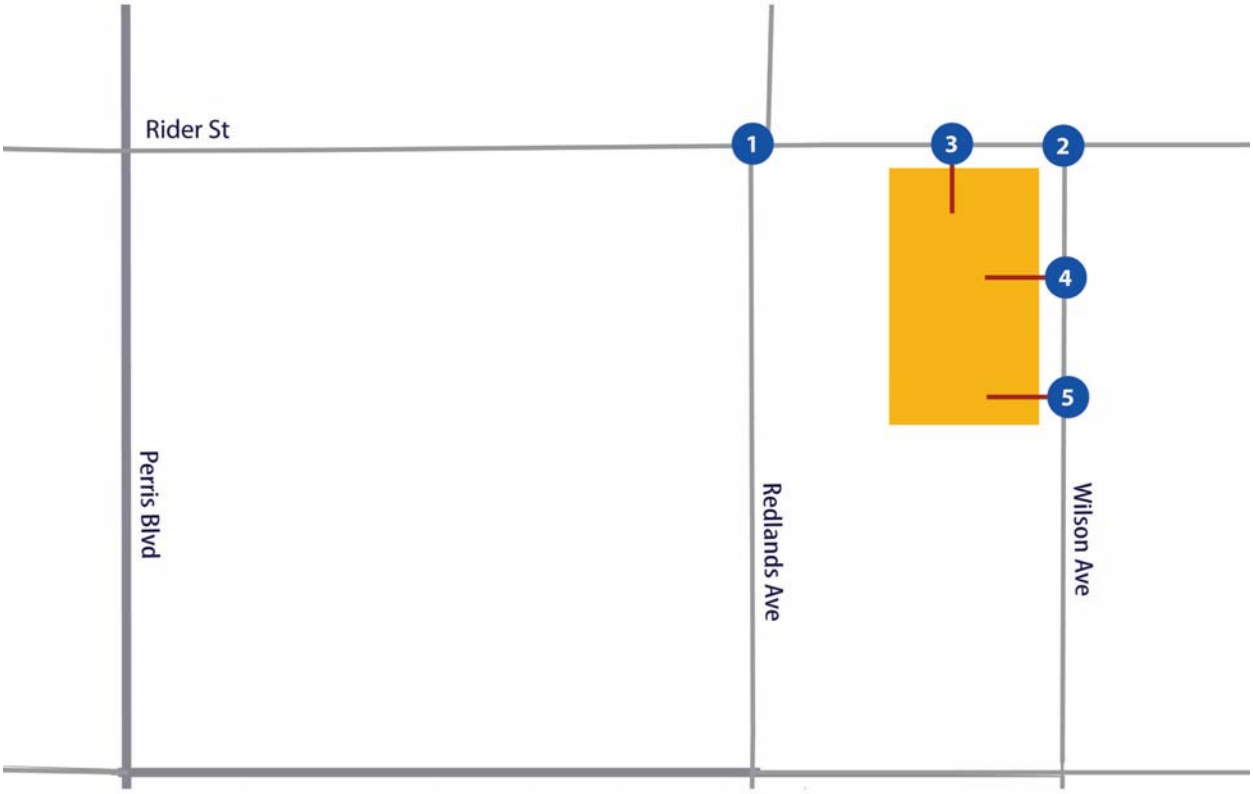
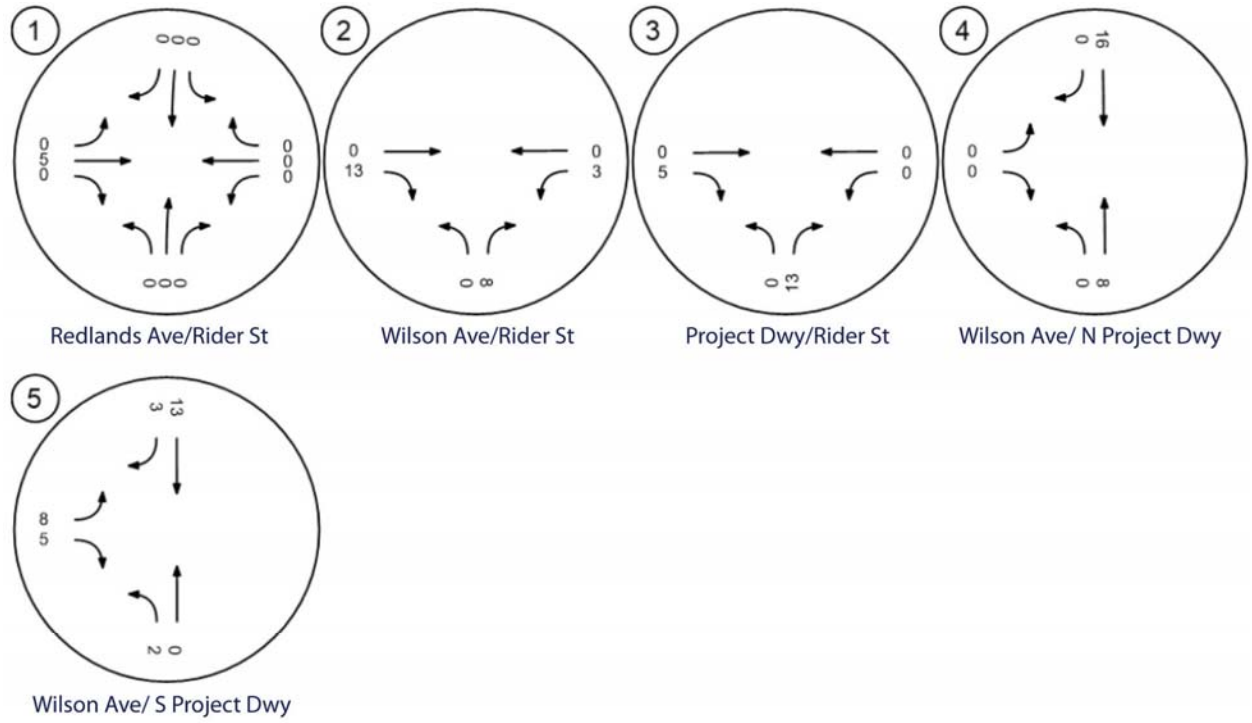


Figure 19: Opening Year PM Project Auto Trips



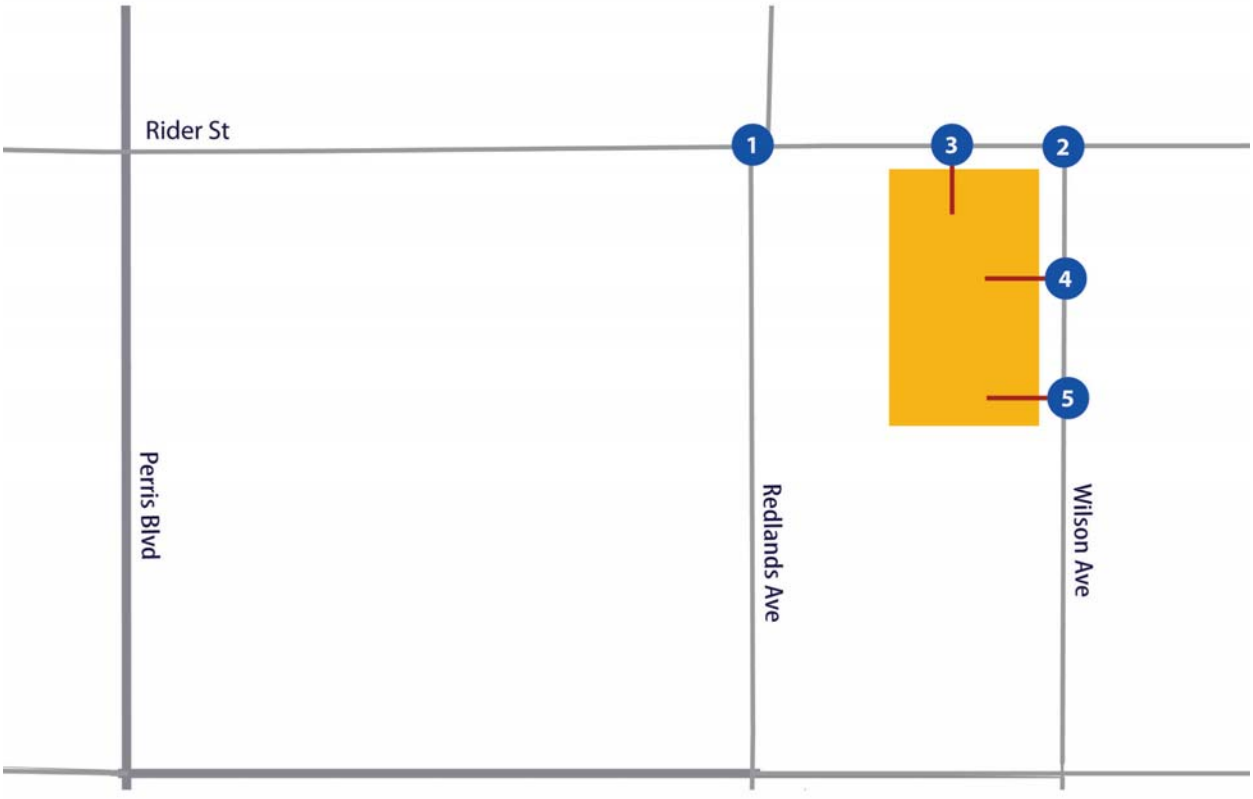
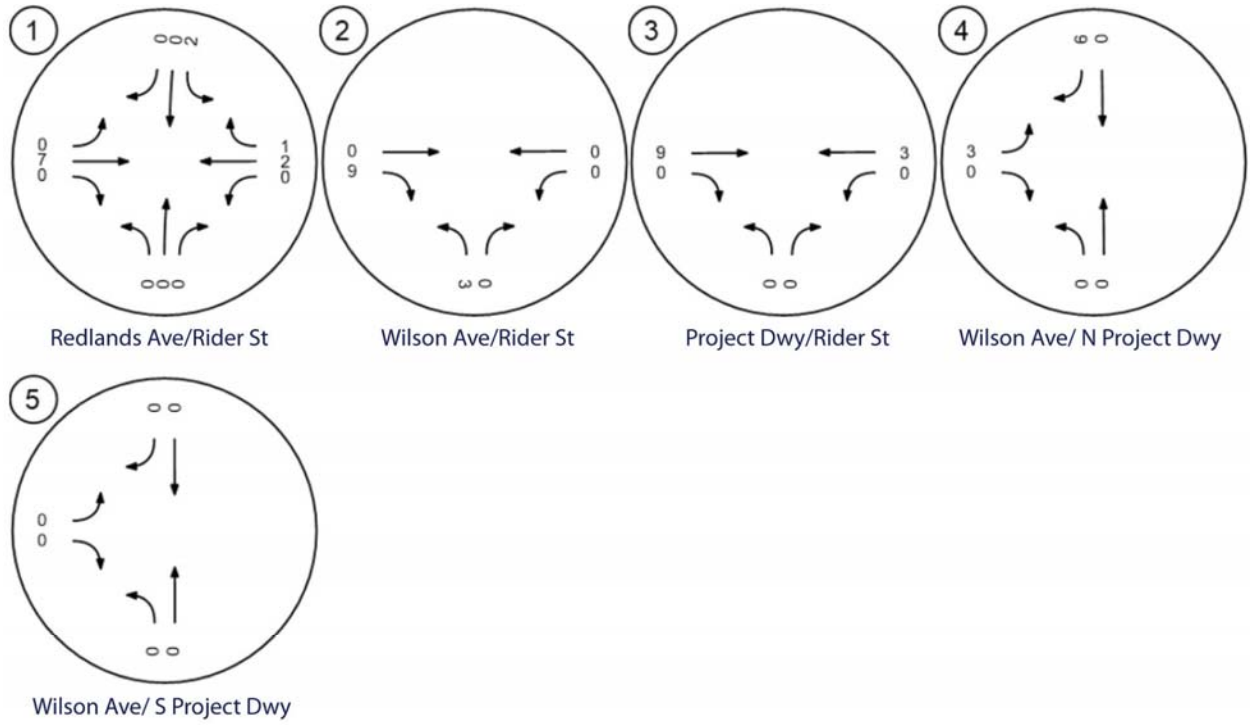


Figure 20: Opening Year AM Project Truck Trips



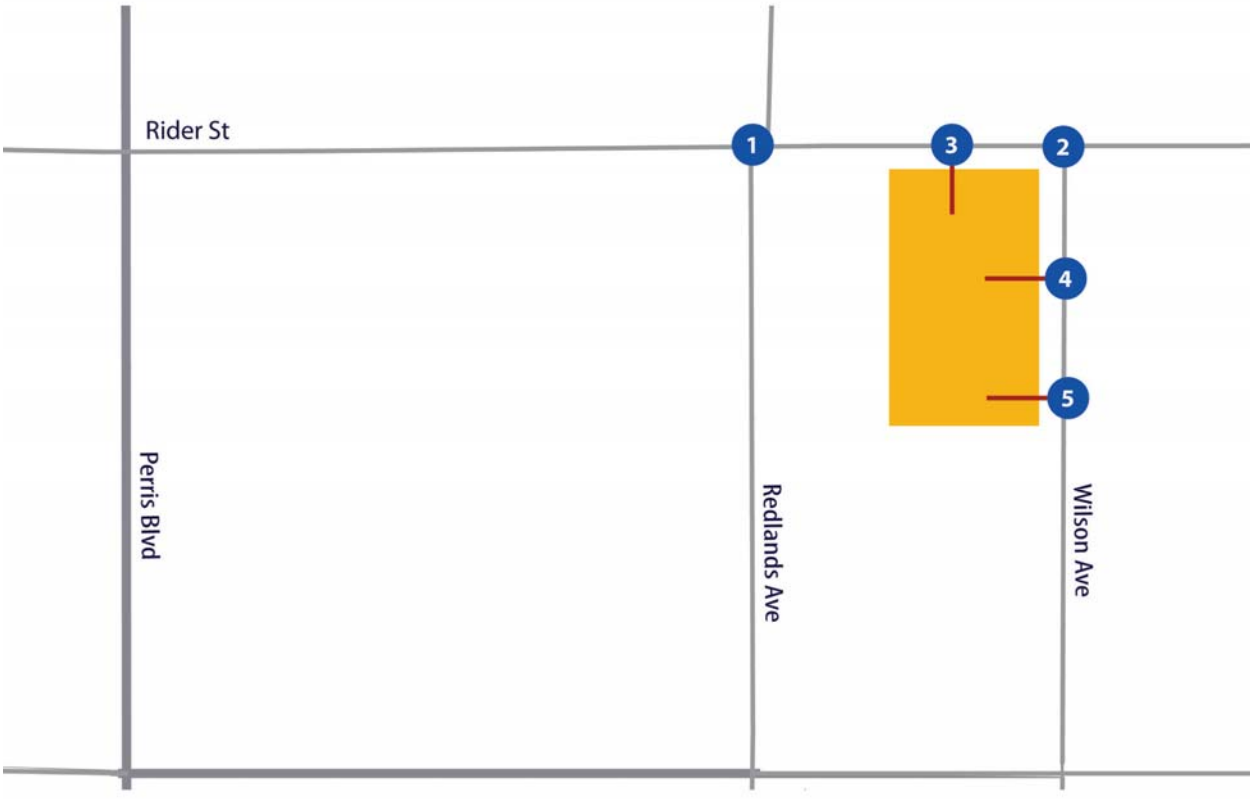
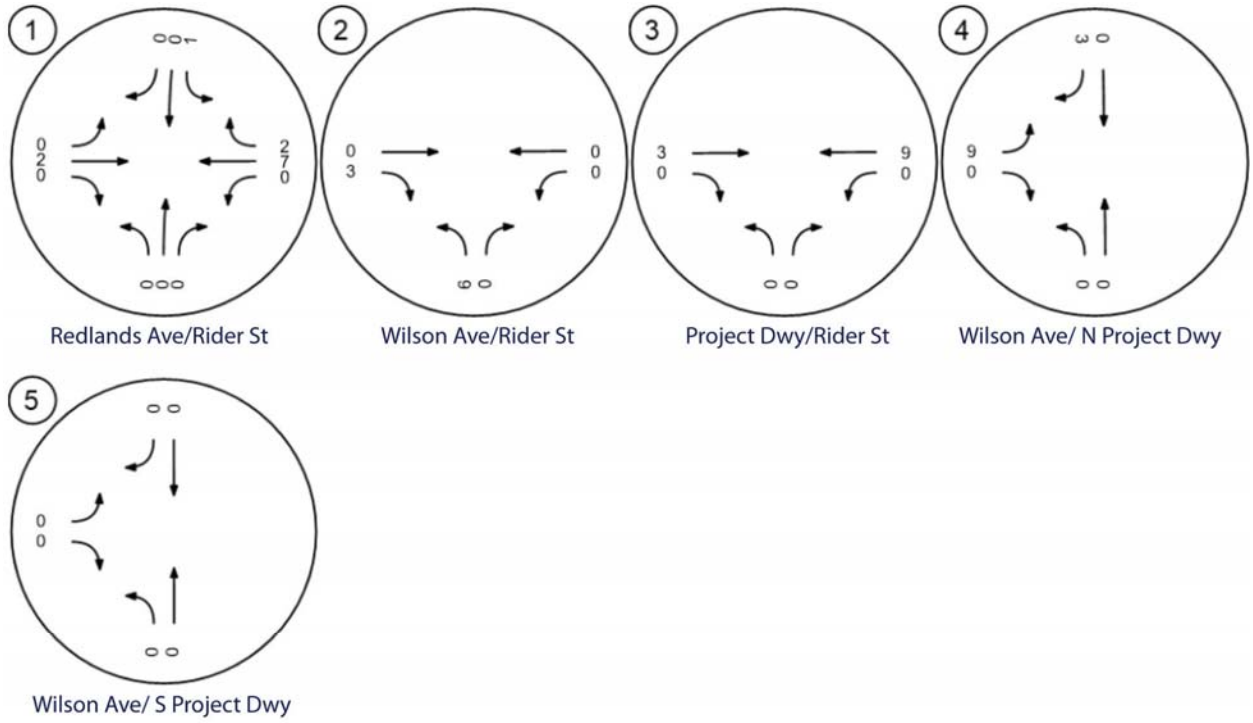


Figure 21: Opening Year PM Project Truck Trips



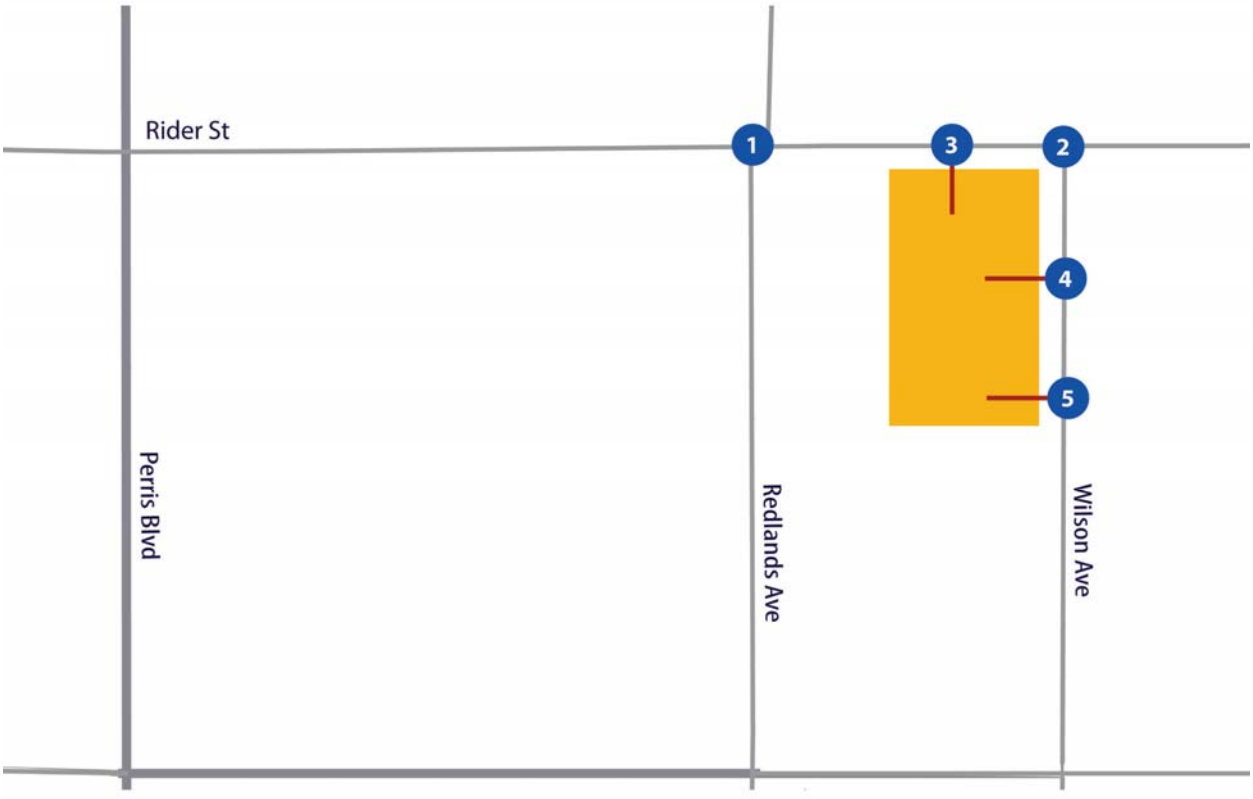
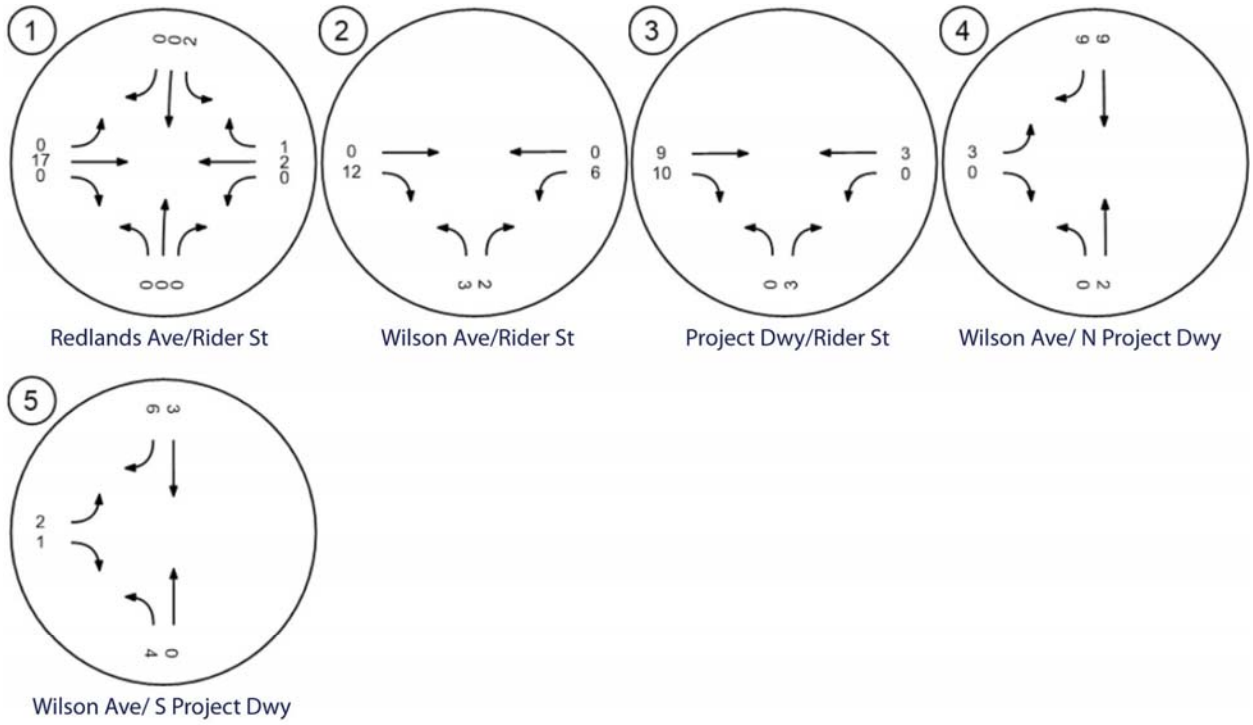


Figure 22: Opening Year AM Total Project Trips



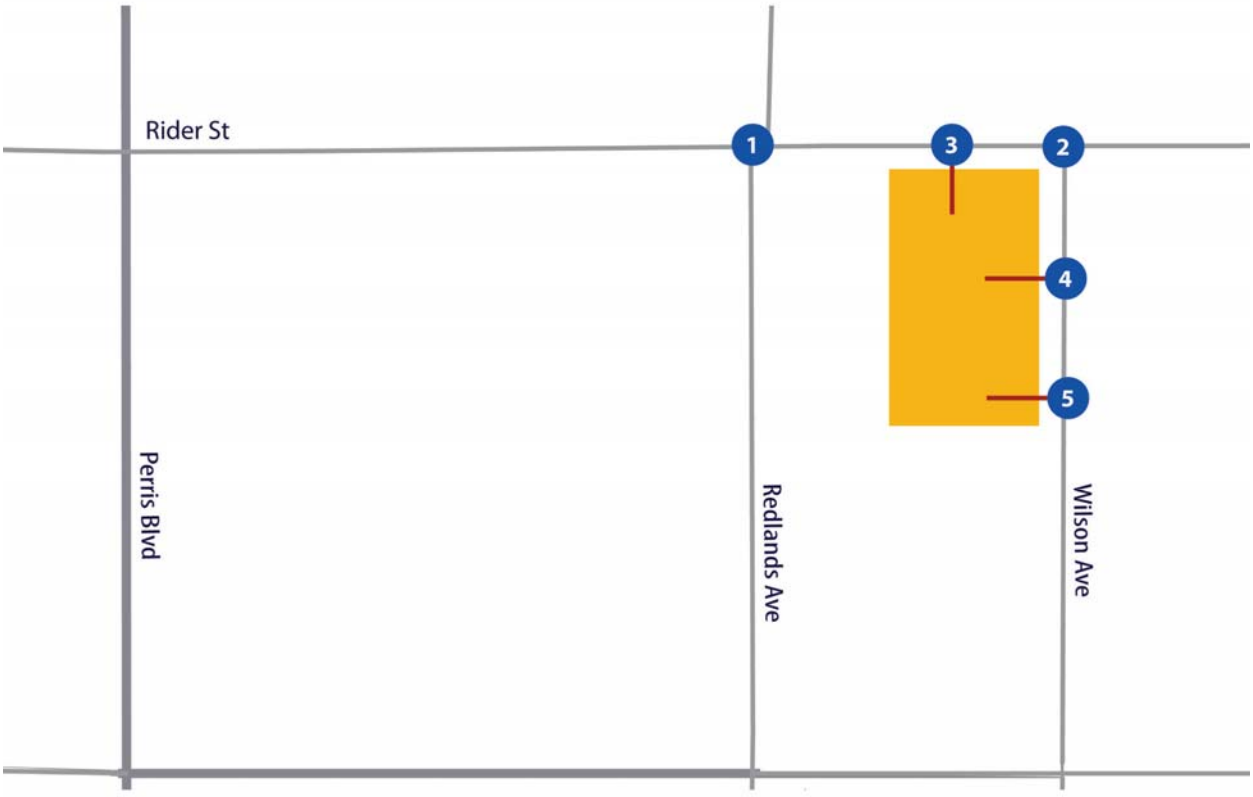
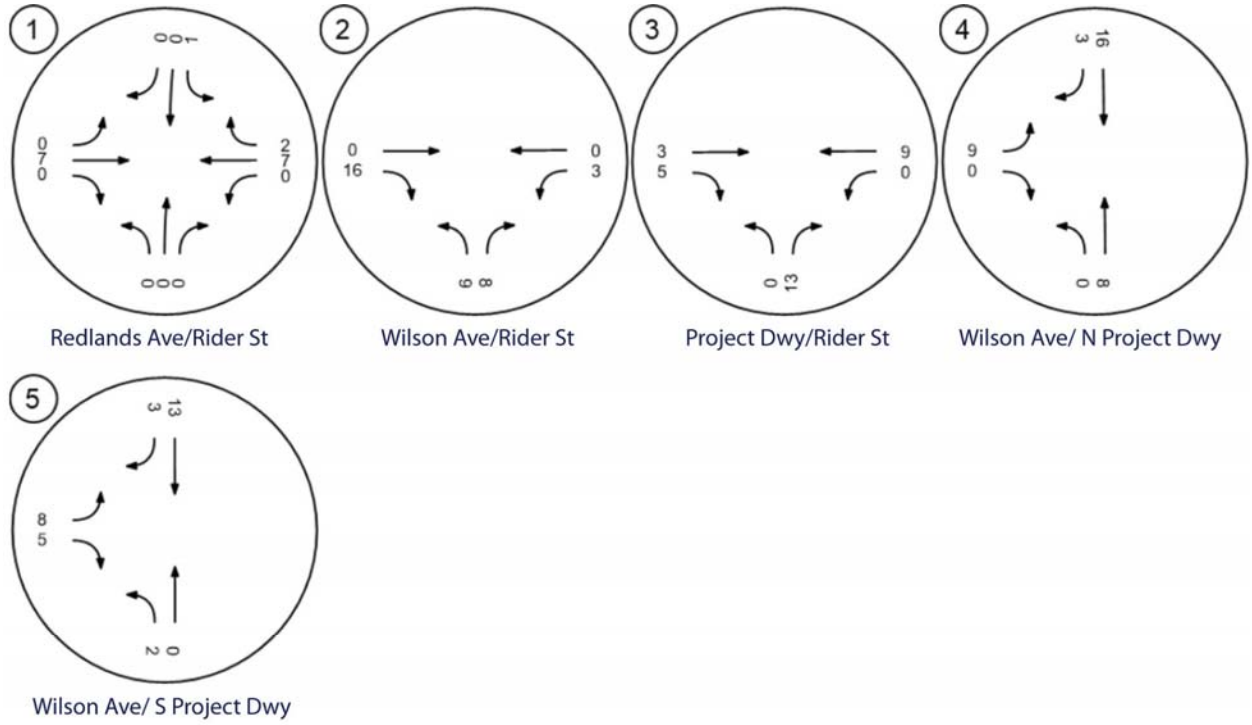
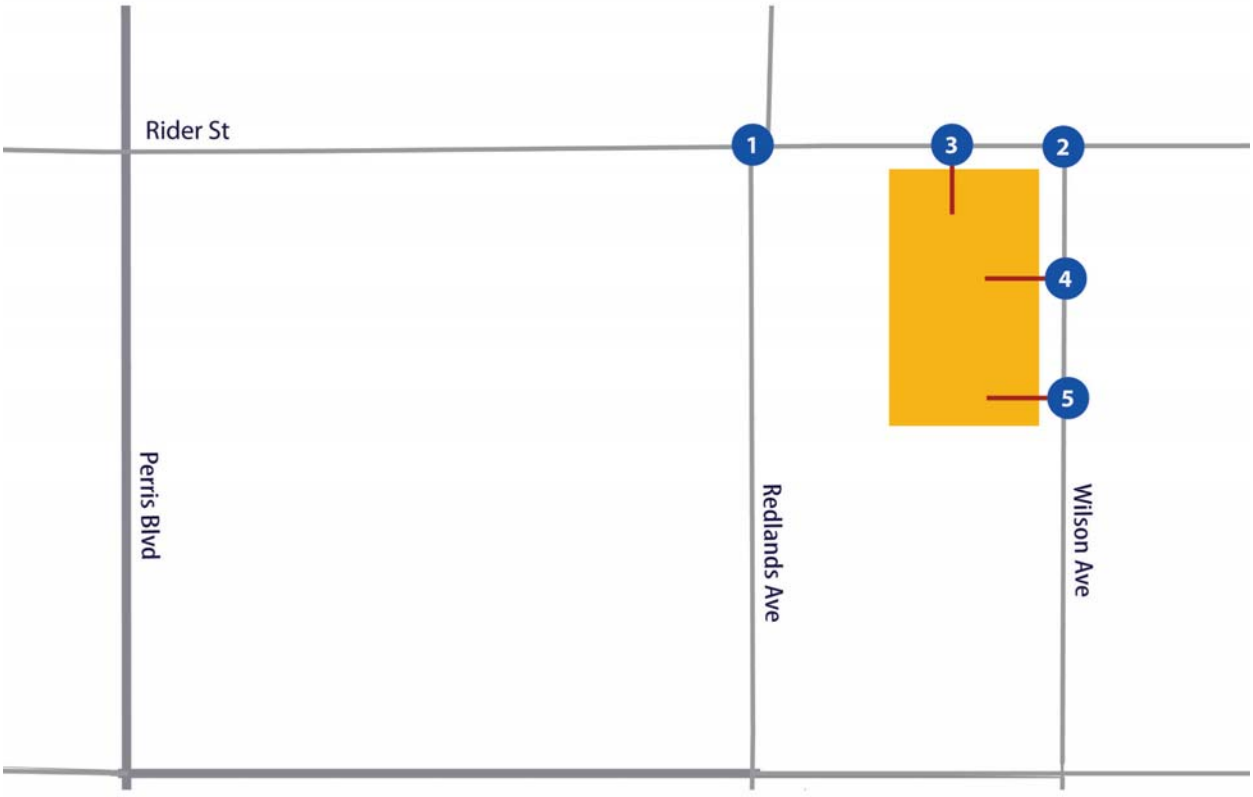


Figure 23: Opening Year PM Total Project Trips





5 PROJECT IMPACTS

5.1 Existing Plus Project Traffic Volumes and Intersection Operations

Existing plus Project traffic volumes were determined by adding the project trips to Existing Without Project traffic volumes. The Existing plus Project weekday AM and PM peak hour traffic volumes at the study intersections are shown in Figure 24 and 25 respectively.

An intersection operations analysis was conducted for the study area to evaluate the Existing plus Project weekday AM and PM peak hour conditions. Intersection operations were calculated using the LOS methodology described previously in Section 2.3 - Methodology. Table 7 provides a comparison between the Existing Without and With Project conditions.

As shown in Table 7, all the intersections would operate with satisfactory LOS of D or better in the Existing plus Project Condition with the exception of Wilson Avenue/Rider Street which would operate at LOS F during AM peak hour and LOS E during the PM peak hour. The project would not cause a direct significant impact, per the City's significance criteria, because the project would add fewer than 50 peak hour trips. Therefore, the project's mitigation responsibility would be limited to a fair-share contribution.

To mitigate the LOS deficiency at Wilson Avenue/Rider Street, it is recommended that a traffic signal be constructed. As shown in Table 7, Wilson Avenue/Rider Street would operate at LOS A in the AM and PM peak hour with construction of a traffic signal.

5.2 Opening Year (2022) Plus Project Traffic Volumes and Intersection Operations

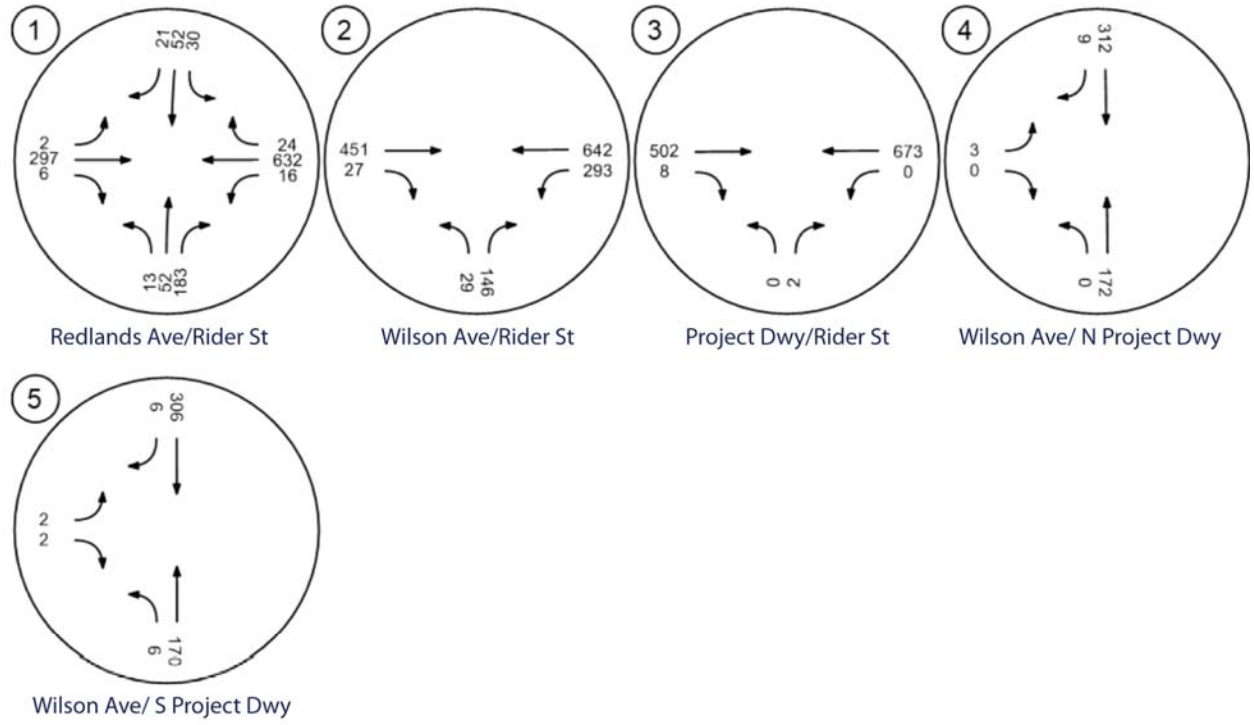
Opening Year with-project traffic volumes were determined by adding the project trips to the Cumulative Baseline traffic volumes. The Opening Year plus Project weekday AM and PM peak hour traffic volumes at the study intersections are shown in Figure 26 and 27 respectively.

An intersection operations analysis was conducted for the study area to evaluate the Cumulative with-Project weekday AM and PM peak hour conditions. Intersection operations were calculated using the LOS methodology described previously. Table 8 provides a comparison between the Opening Year without and with-project conditions.

As shown in Table 8, all of intersections would operate with satisfactory LOS of D or better in the Opening Year plus Project Condition with the exception of Wilson Avenue/Rider Street which would operate at LOS F during both AM and PM peak hours. The project would not cause a direct significant impact, per the City's significance criteria, because the project would add fewer than 50 peak hour trips. Therefore, the project's mitigation responsibility would be limited to a fair-share contribution.

To mitigate the LOS deficiency at Wilson Avenue/Rider Street, it is recommended that a traffic signal be constructed. As shown in Table 8, Wilson Avenue/Rider Street would operate at LOS A in the AM and LOS B in the PM peak hour with construction of a traffic signal.

Figure 24: Existing Plus Project AM Peak Hour Traffic Volumes



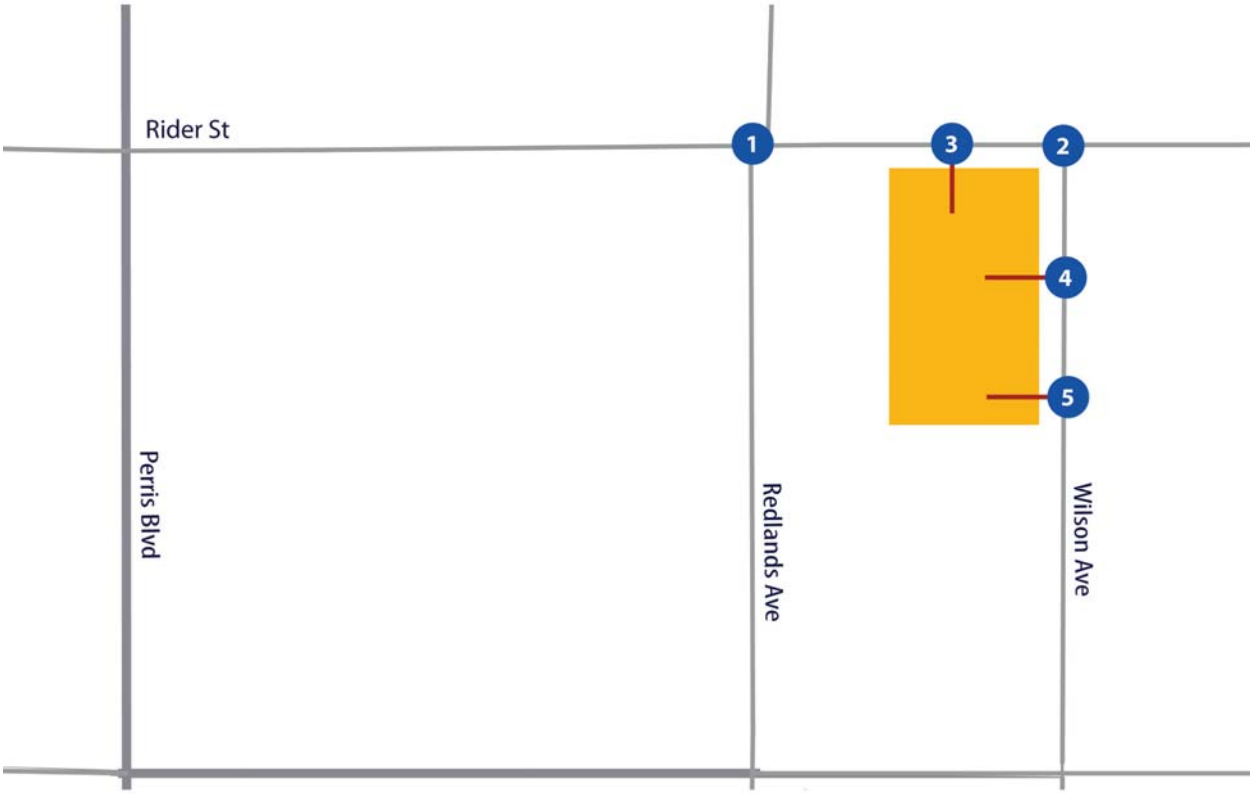
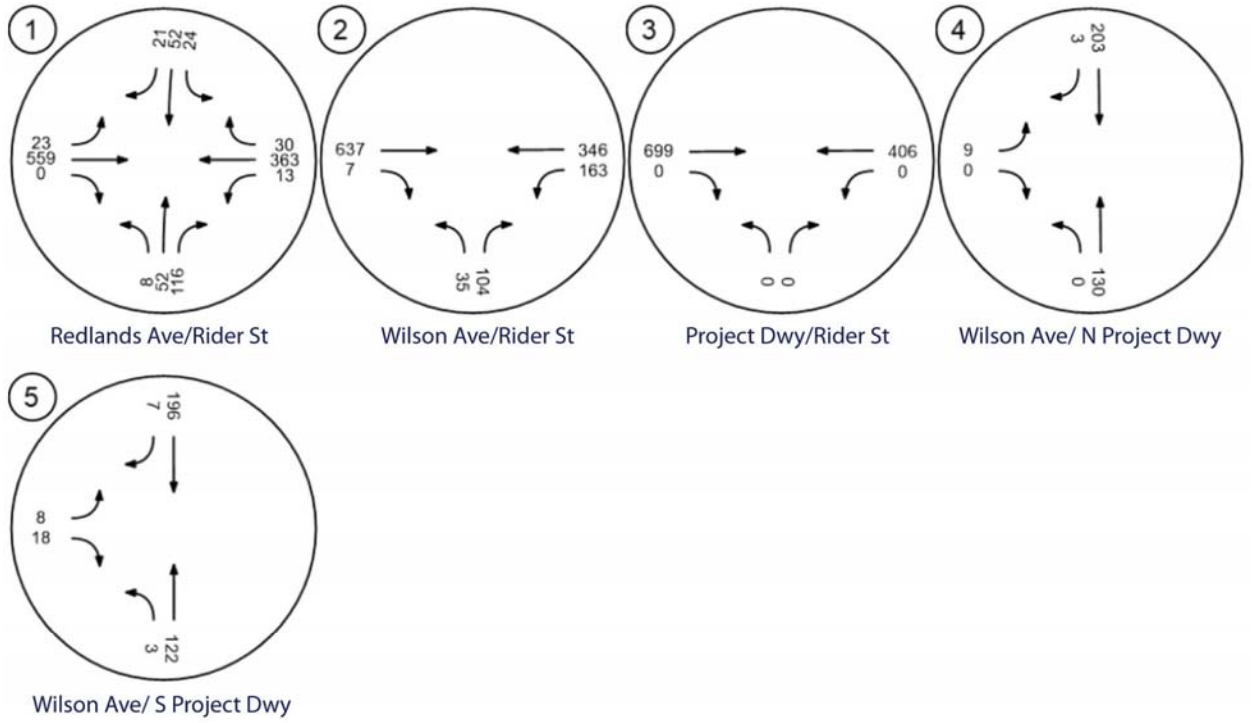


Figure 25: Existing Plus Project PM Peak Hour Traffic Volumes



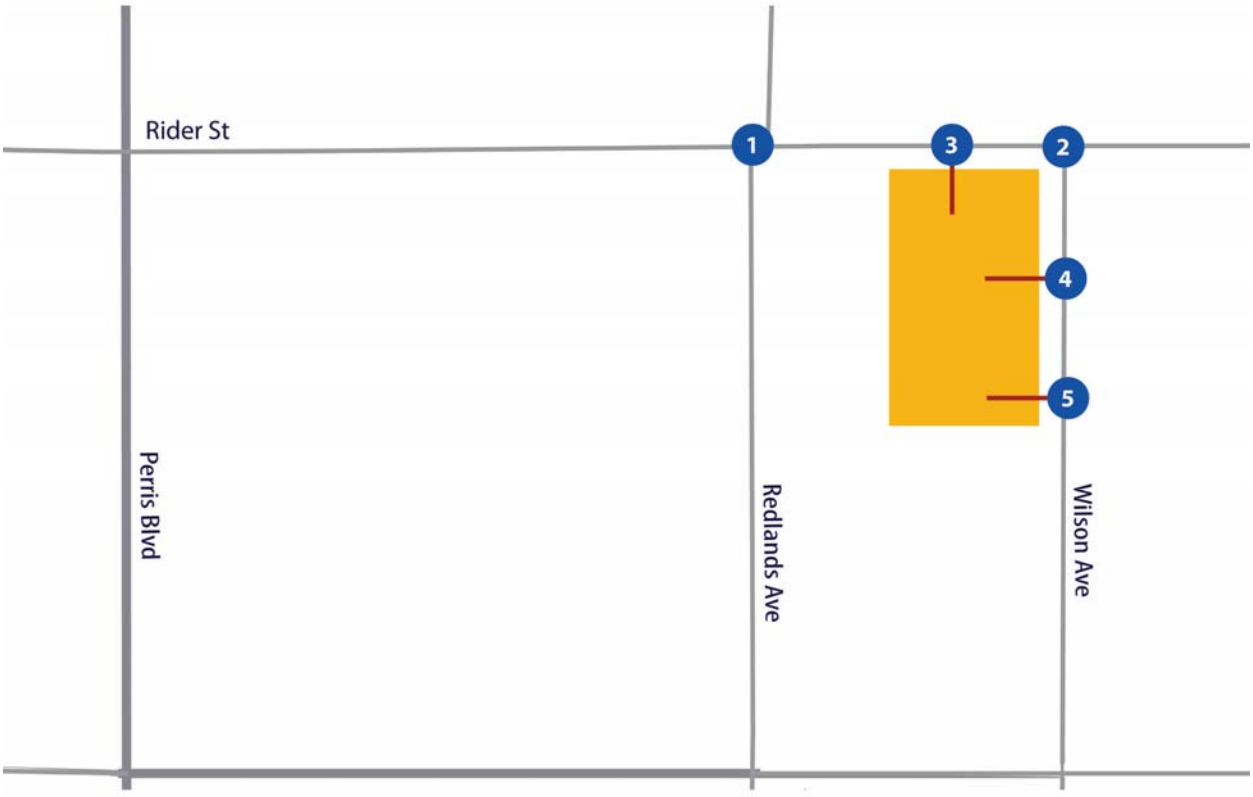
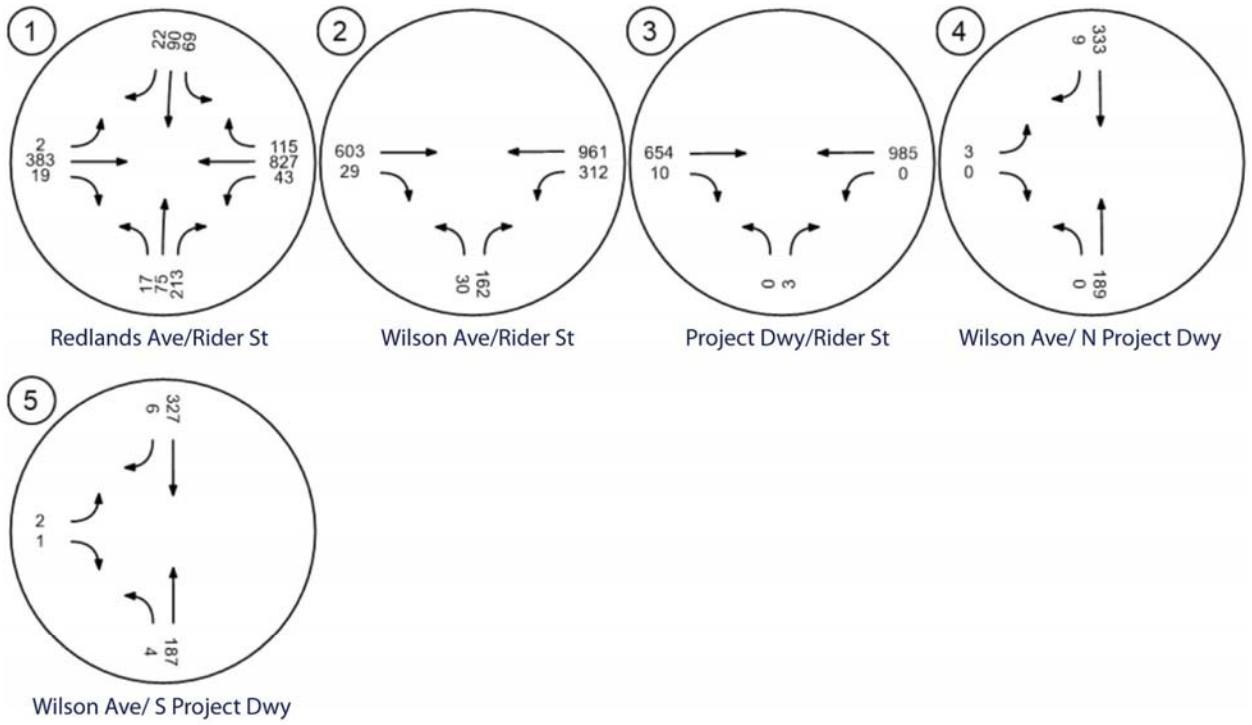


Figure 26: Opening Year Plus Project AM Peak Hour Traffic Volumes



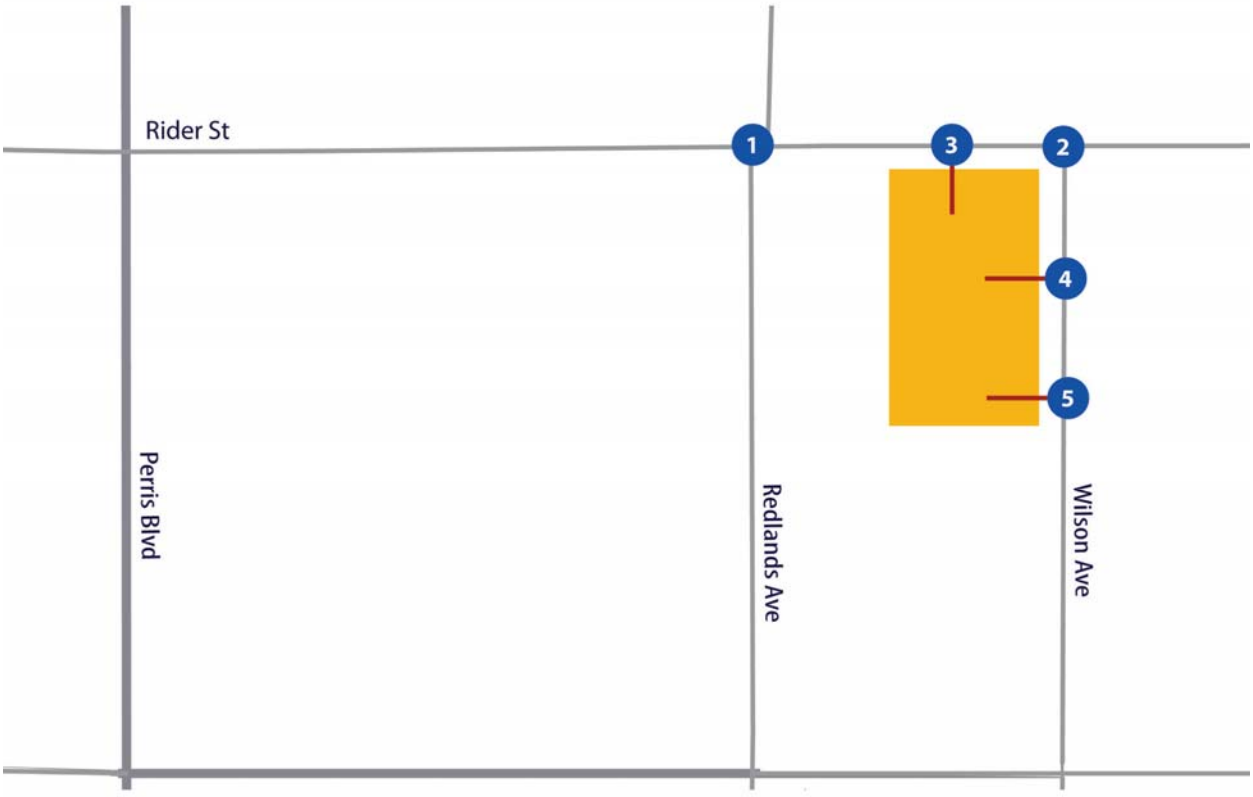


Figure 27: Opening Year Plus Project PM Peak Hour Traffic Volumes

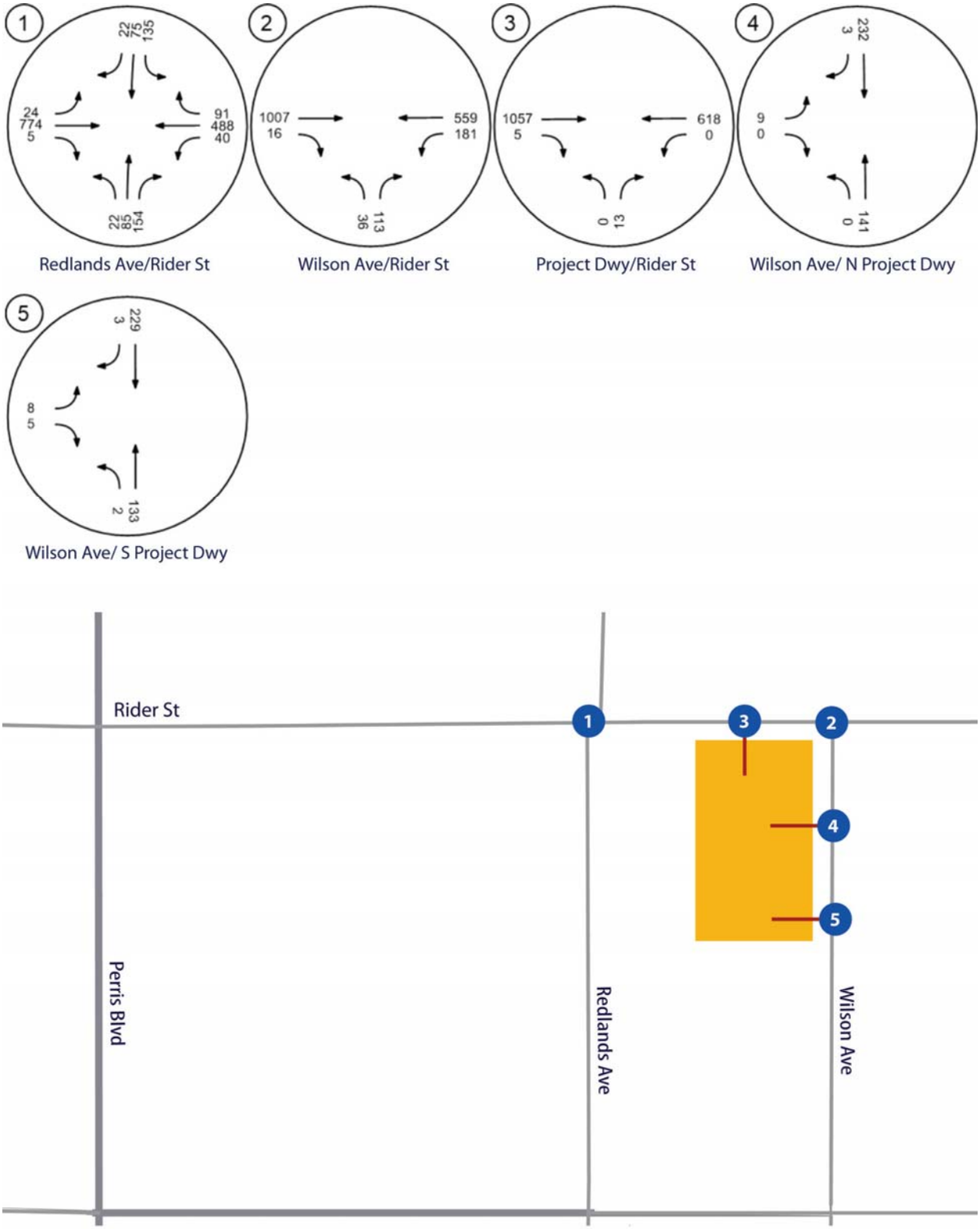


Table 7. Existing and Existing plus Project Peak Hour Levels of Service

Intersection	Traffic Control	Existing				Existing plus Project				Impact?	
		AM Peak		PM Peak		AM Peak		PM Peak			
		Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	AM	PM
1. Redlands Avenue/Rider Street	Signal	13.8	B	14.0	B	13.9	B	14.0	B	No	No
2. Wilson Avenue/Rider Street	TWSC	88.3	F	41.0	E	103.8	F	45.7	E	Yes	No
3. Project Driveway/Rider Street	TWSC	-	-	-	-	9.9	A	0.0	A	No	No
4. Wilson Avenue/North Project Driveway	TWSC	-	-	-	-	12.0	B	10.7	B	No	No
5. Wilson Avenue/South Project Driveway	TWSC	-	-	-	-	12.0	B	10.7	B	No	No
Mitigated											
2. Wilson Avenue/Rider Street	Signal	-	-	-	-	6.31	A	6.12	A	No	No

TWSC = Two-Way Stop Controlled
AWSC = Two-Way Stop Controlled
[1] Delay in Seconds
[2] Level of Service

Table 8. Opening Year Baseline and Opening Year plus Project Peak Hour Levels of Service

Intersection	Traffic Control	Opening Year				Opening Year plus Project				Impact?	
		AM Peak		PM Peak		AM Peak		PM Peak			
		Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	AM	PM
1. Redlands Avenue/Rider Street	Signal	15.6	B	28.9	C	15.7	B	30	C	No	No
2. Wilson Avenue/Rider Street	TWSC	128.3	F	105.3	F	157.3	F	150.1	F	Yes	Yes
3. Project Driveway/Rider Street	TWSC	-	-	-	-	10.6	B	12.9	B	No	No
4. Wilson Avenue/North Project Driveway	TWSC	-	-	-	-	12.3	B	11.0	B	No	No
5. Wilson Avenue/South Project Driveway	TWSC	-	-	-	-	12.3	B	11.0	B	No	No
Mitigated											
2. Wilson Avenue/Rider Street	Signal	-	-	-	-	7.75	A	11.66	B	No	No

TWSC = Two-Way Stop Controlled
AWSC = Two-Way Stop Controlled
[1] Delay in Seconds
[2] Level of Service

5.3 Driveway Spacing

The driveway spacing in the project study area was reviewed as per Table 4.0-2 Driveway Spacing, in the Perris Valley Commerce Center Specific Plan On-Site Standards/Guidelines section. As per the table, the appropriate distance between any intersection and driveway on a secondary arterial is 660 feet. The distance between the intersection of Wilson Avenue/Rider Street and the project driveway (for automobiles only) on Rider Street is approximately 350 feet. The total width of the project along Rider Street is 615 feet and the Rider-Redlands Warehouse project driveway is located approximately 60 feet west of the project's western property line. Given the close proximity of the driveway to the adjacent project (19-00016) driveway, placement of the Core5 Business Center project driveway further west on Rider Street would not be advisable.

As per the Table 4.0-2 of the Perris Valley Commerce Center Specific Plan, the appropriate distance between any intersection and driveway on a collector is 330 feet. The distance between the intersection of Wilson Avenue/Rider Street to the truck driveway on Wilson Avenue is approximately 445 feet. The distance between the intersection of Wilson Avenue/Rider Street and automobile project driveway on Wilson Avenue is approximately 740 feet. Hence, the project driveways on Wilson Avenue satisfy the Perris Valley Commerce Center driveway spacing criteria.

A striping plan was prepared to conceptualize the driveway spacing and striping on Rider Street in reference to the project driveway on Rider Street, and the intersection of Wilson Avenue/Rider Street. Figure 28 shows the conceptual striping plan for Rider Street. Figure 28 shows the driveway spacing between driveway on Rider street and the intersection on Wilson Avenue/Rider Street, and truck turning movements for both north and south project driveways on Wilson Avenue.

5.4 Signal Warrant Analysis and Fair Share

A peak hour traffic signal warrant analysis was prepared for Wilson Avenue/Rider Street as it was found to be operating at unsatisfactory LOS in all conditions. The warrant analysis was prepared using the criteria outlined in the California Manual on Uniform Traffic Control Devices (MUTCD), Section 4C.04 – Warrant 3, Peak Hour. The MUTCD notes that Warrant 3 is 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". A large percentage of traffic westbound on Rider Street was observed to turn left onto the minor street of Wilson Avenue. Therefore, the option provided on Page 828, Line 13 was used. This option states: "At an intersection with a high volume of left-turn traffic from the major street, the signal warrant analysis may be performed in a manner that considers the higher volume of the major-street left-turn volumes plus the higher volume minor-street approach as the "minor street" volume and both approaches of the major street minus the higher of the major-street left-turn volume as "major street" volume." Nine traffic signal warrants are provided in the MUTCD for evaluating various conditions that may require a traffic signal. The MUTCD notes that "the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal". As such, this warrant analysis is provided only as an indicator of whether the peak hour traffic volumes would warrant a traffic volume during the peak hours of the day and does not represent a full warrant analysis. A summary of the peak hour warrant analysis results is provided in Table 9.

Table 9. Traffic Signal Warrant Analysis Summary

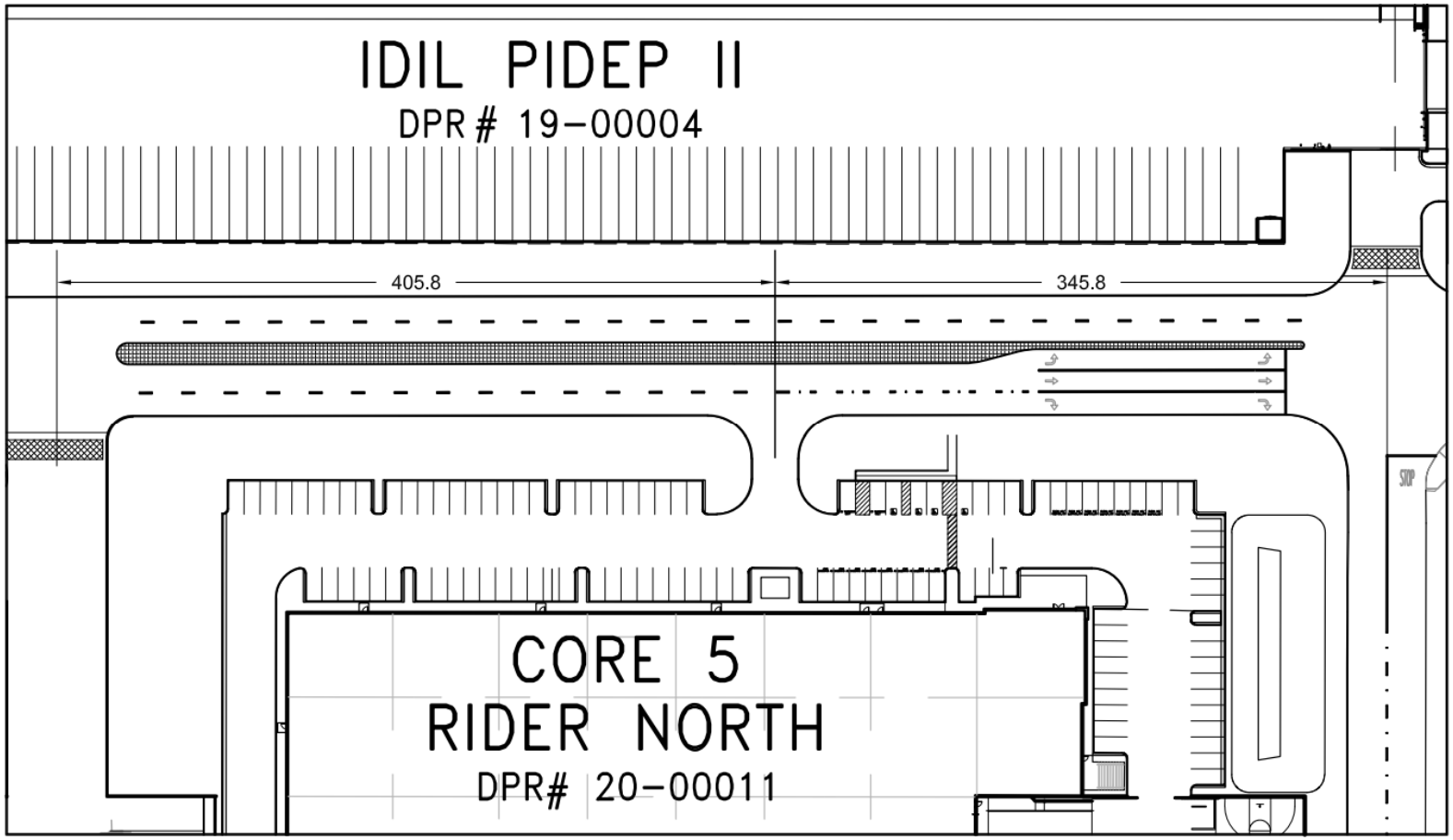
Wilson Avenue/Rider Street	Baseline		Baseline plus Project	
	AM	PM	AM	PM
Existing	Yes	Yes	Yes	Yes
Opening Year	Yes	Yes	Yes	Yes

As shown in Table 9, Wilson Avenue/Rider Street would meet the minimum volumes outlined in Warrant 3 – Peak Hour in all scenarios. Therefore, a signal is recommended for Wilson Avenue/Rider Street. Table 10 shows the fair share calculation of the project impact.

Table 10. Project Fair Share Contribution

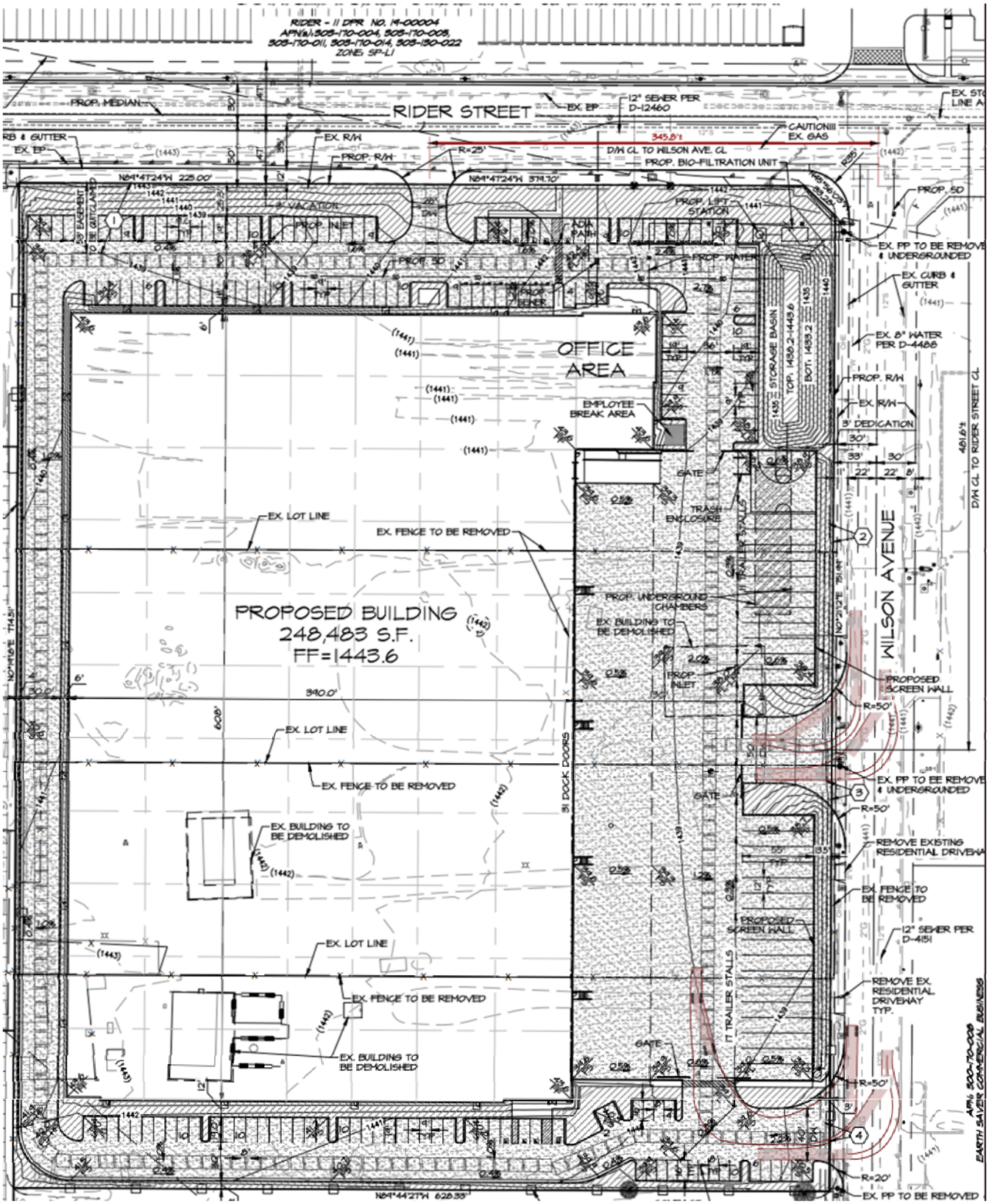
Intersection	AM Peak Hour					PM Peak Hour					Project Fair Share
	Existing	Project	Opening Year with Project	Total New Traffic	Project % of New Traffic	Existing	Project	Opening Year with Project	Total New Traffic	Project % of New Traffic	
Wilson Avenue/Rider Street	1566	20	2098	532	3.76%	1265	24	1890	625	3.84%	3.84%

Figure 28: Rider Street Conceptual Striping Plan



Base Drawing: Provided by Webb Associates
Conceptual Striping: EPD Solutions
Scale: 1" = 100'

Figure 29: Driveway Spacing and Truck Turning Template



Base Drawing: Provided by Webb Associates; Drawing Not to Scale.

APPENDIX A – TRAFFIC STUDY SCOPING AGREEMENT

ENVIRONMENT | PLANNING | DEVELOPMENT SOLUTIONS, INC.

To:	City of Perris, Department of Engineering
From:	Meghan Macias, TE
Date:	10/08/2020
Re:	Vehicle Miles Traveled and Level of Service Analysis Scoping Agreement for the Core5 Rider Commerce Center project.

EPD has prepared a VMT screening analysis as well as scoping agreements for Vehicle Miles Traveled (VMT) and Level of Service (LOS) analyses for the proposed Core5 Rider Commerce Center project. The project is located on approximately 11 acres at the southwest corner of Rider Street and Wilson Avenue in the City of Perris. The project proposes to develop a 248,442 square-foot warehouse.

Vehicle Miles Traveled

The City of Perris TIA Guidelines for CEQA were consulted to determine whether a VMT analysis would be required for the project. The Scoping Form included in the City's TIA Guidelines has been completed and is attached. Based on the scoping criteria and evaluation using the WRCOG VMT Screening Tool, the project would be presumed to have a less than significant impact on VMT because it is located within a low VMT area.

Project Trip Generation

The project trip generation was prepared using trip rates for fulfillment center land use from the TUMF High-Cube Warehouse Trip Generation Study, prepared by WSP in January 2019. Table 1 of the attached scoping agreement presents the trip generation estimate for the proposed project.

The project is forecast to generate 529 daily trips including 30 trips during the AM peak hour and 41 trips during the PM peak hour. When the effect of heavy truck trips are evaluated, the passenger car equivalent (PCE) trip generation would be 694 daily PCE trips including 38 PCE trips during the AM peak hour and 50 PCE trips during the PM peak hour. The City of Perris TIA Guidelines for CEQA states that a traffic impact study (TIS) with LOS analysis is required for projects which exceed 500 daily trips. Therefore, a scoping agreement for the LOS traffic analysis is attached.

If you have any questions about this analysis, please contact me at (949) 794-1186 or meghan@epdsolutions.com.

Urban Planning ■ Due Diligence ■ Entitlements ■ CEQA/NEPA ■ Development Services ■ Management ■ Public Outreach
2 Park Plaza, Suite 1120 ■ Irvine, CA 92614
949.794.1180 ■ info@epdsolutions.com

City of Perris
www.cityofperris.org

CITY OF PERRIS
VMT SCOPING FORM FOR LAND USE PROJECTS

This Scoping Form acknowledges the City of Perris requirements for the evaluation of transportation impacts under CEQA. The analysis provided in this form should follow the City of Perris TIA Guidelines, dated May 12, 2020.

I. Project Description

Tract/Case No.: DPR 20-00011

Project Name: Rider North Assemblage Project

Project Location: Southwest Corner of Rider Street and Wilson Avenue

Project Description: 248,442 square-foot warehouse
(Please attach a copy of the project Site Plan)

Current GP Land Use: PVCC SP **Proposed GP Land Use:** PVCC SP

Current Zoning: PVCC SP **Proposed Zoning:** PVCC SP

If a project requires a General Plan Amendment or Zone change, then additional information and analysis should be provided to ensure the project is consistent with RHNA and RTP/SCS Strategies.

II. VMT Screening Criteria

	YES		NO		Attachments:	
A. Is the Project 100% affordable housing?	YES		NO	X	Attachments:	
B. Is the Project within 1/2 mile of qualifying transit?	YES		NO	X	Attachments:	
C. Is the Project a local serving land use?	YES		NO	X	Attachments:	
D. Is the Project in a low VMT area?	YES	X	NO		Attachments:	
E. Are the Project's Net Daily Trips less than 500 ADT?	YES		NO	X	Attachments:	X

Low VMT Area Evaluation:

Citywide VMT Averages[1]		
Citywide Home-Based VMT =	15.05	VMT/Capita
Citywide Employment-Based VMT =	11.62	VMT/Employee

WRCOG VMT MAP

Project TAZ	VMT Rate for Project TAZ[1]		
3,814	VMT/Capita	Residential:	
	VMT/Employee	Non-Residential:	9.95

[1] Base year (2012) projections from RIVTAM.

Trip Generation Evaluation:

Source of Trip Generation: TUMF High-Cube Warehouse Trip Generation Study

Project Trip Generation: 529 Average Daily Trips (ADT) 30 AM Peak/41 PM Peak

Internal Trip Credit:	YES		NO	X	% Trip Credit:	
Pass-By Trip Credit:	YES		NO	X	% Trip Credit:	
Affordable Housing Credit:	YES		NO	X	% Trip Credit:	
Existing Land Use Trip Credit:	YES		NO	X	Trip Credit:	

Net Project Daily Trips: -- Average Daily Trips (ADT) Attachments: X

Does project trip generation warrant an LOS evaluation outside of CEQA? YES X- NO --

III. VMT Screening Summary

A. Is the Project presumed to have a less than significant impact on VMT?

A Project is presumed to have a less than significant impact on VMT if the Project satisfies at least one (1) of the VMT screening criteria.

Yes --

B. Is mitigation required?

If the Project does not satisfy at least one (1) of the VMT screening criteria, then mitigation is required to reduce the Project's impact on VMT.

No --

C. Is additional VMT modeling required to evaluate Project impacts?

YES	--	NO	X

If the Project requires a zone change and/or General Plan Amendment AND generates 2,500 or more net daily trips, then additional VMT modeling using RIVTAM/RIVCOM is required. If the project generates less than 2,500 net daily trips, the Project TAZ VMT Rate can be used for mitigation purposes.

IV. MITIGATION

A. Citywide Average VMT Rate (Threshold of Significance) for Mitigation Purposes: -- --

B. Unmitigated Project TAZ VMT Rate: -- --

C. Percentage Reduction Required to Achieve the Citywide Average VMT: --

D. VMT Reduction Mitigation Measures:

Source of VMT Reduction Estimates:	
Project Location Setting	

	VMT Reduction Mitigation Measure:	Estimated VMT Reduction (%)
1.		0.00%
2.		0.00%
3.		0.00%
4.		0.00%
5.		0.00%
6.		0.00%
7.		0.00%
8.		0.00%
9.		0.00%
10.		0.00%
Total VMT Reduction (%)		**0.00%**

(Attach additional pages, if necessary, and a copy of all mitigation calculations.)

E. Mitigated Project TAZ VMT Rate: -- --

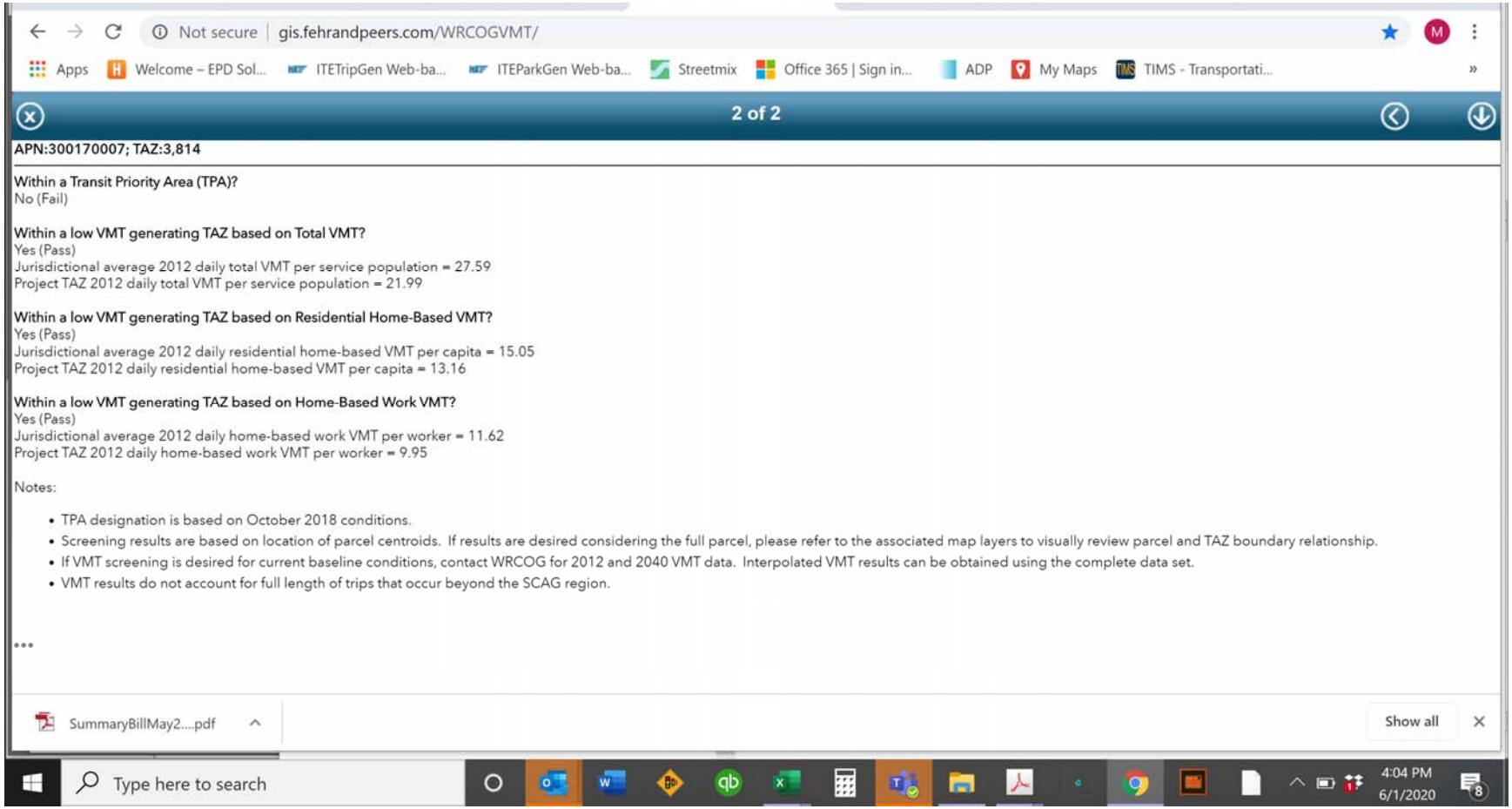
F. Is the project pressumed to have a less than significant impact with mitigation? --

If the mitigated Project VMT rate is below the Citywide Average Rate, then the Project is presumed to have a less than significant impact with mitigation. If the answer is no, then additional VMT modeling may be required and a potentially significant and unavoidable impact may occur. All mitigation measures identified in Section IV.D. are subject to become Conditions of Approval of the project. Development review and processing fees should be submitted with, or prior to the submittal of this Form. The Planning Department staff will not process the Form prior to fees being paid to the City.

Prepared By			Developer/Applicant		
Company:	EPD Solutions, Inc.		**Company:**	Core 5 Industrial Partners, LLC	
Contact:	Meghan Macias, TE		**Contact:**	Jon Kelly, VP/Development	
Address:	2 Park Plaza, Suite 1120, Irvine, CA 92614		**Address:**	300 Spectrum Center Dr, Ste 300, Irvine,	CA 92618
Phone:	(949) 794-1186		**Phone:**	949-467-3290	
Email:	meghan@epdsolutions.com		**Email:**	jkelly@c5ip.com	
Date:	August 3, 2020		**Date:**	August 3, 2020	

Approved by:

Perris Development Serivces Dept.	**Date**	**Perris Public Works Dept.**	**Date**


Not secure | gis.fehrandpeers.com/WRCOGVMT/
Apps
Welcome – EPD Sol...
ITETripGen Web-ba...
ITEParkGen Web-ba...
Streetmix
Office 365 | Sign in...
ADP
My Maps
TIMS - Transportati...
2 of 2
APN:300170007; TAZ:3,814
Within a Transit Priority Area (TPA)?
No (Fail)
Within a low VMT generating TAZ based on Total VMT?
Yes (Pass)
Jurisdictional average 2012 daily total VMT per service population = 27.59
Project TAZ 2012 daily total VMT per service population = 21.99
Within a low VMT generating TAZ based on Residential Home-Based VMT?
Yes (Pass)
Jurisdictional average 2012 daily residential home-based VMT per capita = 15.05
Project TAZ 2012 daily residential home-based VMT per capita = 13.16
Within a low VMT generating TAZ based on Home-Based Work VMT?
Yes (Pass)
Jurisdictional average 2012 daily home-based work VMT per worker = 11.62
Project TAZ 2012 daily home-based work VMT per worker = 9.95
Notes:
• TPA designation is based on October 2018 conditions.
• Screening results are based on location of parcel centroids. If results are desired considering the full parcel, please refer to the associated map layers to visually review parcel and TAZ boundary relationship.
• If VMT screening is desired for current baseline conditions, contact WRCOG for 2012 and 2040 VMT data. Interpolated VMT results can be obtained using the complete data set.
• VMT results do not account for full length of trips that occur beyond the SCAG region.
SummaryBillMay2....pdf
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6/1/2020

SCOPING AGREEMENT FOR TRAFFIC IMPACT STUDY

This letter acknowledges the City of Perris requirements for traffic impact analysis of the following project.

Case No.	DPR 20-00011
Related Cases -	PR 19-05267
SP No.	
EIR No.	
GPA No.	
CZ No.	
Project Name:	Core 5 Rider Commerce Center
Project Address:	Southwest Corner of Rider Street and Wilson Avenue
Project Description:	248,442 square-foot warehouse

	Consultant	Developer
Name:	EPD Solutions	Core 5 Industrial Partners, LLC
Address:	2 Park Plaza, Suite #1120	300 Spectrum Center Dr, Suite #300
	Irvine, CA 92614	Irvine, CA 92618
Telephone:	949-794-1180	949-467-3290
Fax:		

A. Trip Generation Source: TUMF High-Cube Warehouse Trip Generation Study

Current GP Land Use:	PVCC SP	Proposed Land Use: PVCC SP
Current Zoning:	PVCC SP	Proposed Zoning PVCC SP

	Current Trip Generation:			Proposed Trip Generation		
Passenger Cars	In	Out	Total	In	Out	Total
AM Trips	0	0	0	23	7	30
PM Trips	0	0	0	11	30	41

	Current Trip Generation:			Proposed Trip Generation		
Truck	In	Out	Total	In	Out	Total
AM Trips	0	0	0	3	1	4
PM Trips	0	0	0	1	4	5

Internal Trip Allowance	Yes	No	X	% Trip Discount
Pass-By Trip Allowance	Yes	No	X	% Trip Discount

A pass by trip discount of 25% is allowed for appropriate land uses. The pass by trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

B. Trip Geographic Distribution

(See attached exhibit for detailed distribution)

Exisitng Year	**Trucks**	N	80%	S	20%	E	0%	W	0%
	Passenger Cars	N	40%	S	30%	E	30%	W	0%
Opening Year	**Trucks**	N	70%	S	30%	E	0%	W	0%
	Passenger Cars	N	40%	S	30%	E	30%	W	0%

C. Background Traffic

Project buildout Year:	2022	Annual Ambient Growth Rate:	3%
Phase Year(s)	The Placentia Avenue interchange will be assumed to be in place for the Opening Year conditions.		

Other area projects to be analyzed: To be provided by City

Model forecast methodology: Build-Up Method

D. Study Intersections: Note: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.

1 Redlands Avenue/Rider Street
2 Wilson Avenue/Rider Street
3 Project Driveway/Rider Street
4 Wilson Avenue/North Project Driveway
5 Wilson Avenue/South Project Driveway

E. Study Roadway Segments: Note: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.

1
2
3
4
5

F. Other Jurisdictional Impacts

Is the project within a City's sphere of influence or one-mile radius of City boundaries? Yes No X

If so, name of City or Jurisdiction:

G. Site Plan (Copy Attached)

The proposed project driveway locations will be evaluated using the driveway spacing requirements from the Perris Valley Commerce Center Specific Plan

H. Specific Issues to be addressed in the Study (in addition of the standard analysis described in the Guidelines) - To be filled out by transportation department. Note: If the traffic study states that a "traffic signal is warranted" or "a traffic signal appears to be warranted" , or similar statement, at an existing unsignalized intersection, under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.

Truck turning templates at project driveway and a review of internal circulation will be provided in the TIA.

I. Existing Conditions

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts. Date of counts: 5/30/2019

The 5/30/2019 counts will be projected to 2020 counts with a growth rate of 3%.

Note: Traffic Study Submittal Form and appropriate fee must be submitted with, or prior to submittal of this form. Transportation Department staff will not process the Scoping Agreement prior to the fee.

Recommended by: **Approved by:**

Meghan Macias, TE 09/30/2020

Consultant's Representative Date Transportation Department Date

Scoping agreement submitted on: 09/30/2020

Scoping agreement revised on: 10/08/2020

Table 1: Proposed Trip generation

Table 1. Rider Assemblage Trip Generation

				AM Peak Hour			PM Peak Hour		
Land Use		**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates									
TUMF Fulfillment Center Rates[1]		TSF	2.129	0.094	0.028	0.122	0.046	0.119	0.165
Total Vehicle Trip Generation									
Wilson/Rider Warehouse	248.442	TSF	529	23	7	30	11	30	41
Vehicle Mix [1]	**% AM**	***% PM***							
Passenger Vehicles	84.4%	87.3%	435	20	6	26	10	26	36
2- Axle Trucks	1.1%	1.1%	7	0	0	0	0	0	0
3-Axle Trucks	2.2%	2.2%	13	0	0	0	0	1	1
4-Axle Trucks	3.3%	3.3%	20	1	0	1	0	1	1
5+-Axle Trucks	9.0%	6.1%	54	2	1	3	1	2	3
	100.00%	100.00%	529	23	7	30	11	30	41
PCE Trip Generation2		***PCE Factor***							
Passenger Vehicles		1.0	435	20	6	26	10	26	36
2- Axle Trucks		1.5	10	0	0	0	0	0	0
3-Axle Trucks		2.0	27	0	0	0	0	2	2
4-Axle Trucks		3.0	60	3	0	3	0	3	3
5+-Axle Trucks		3.0	162	6	3	9	3	6	9
Total PCE Trip Generation			694	29	9	38	13	37	50

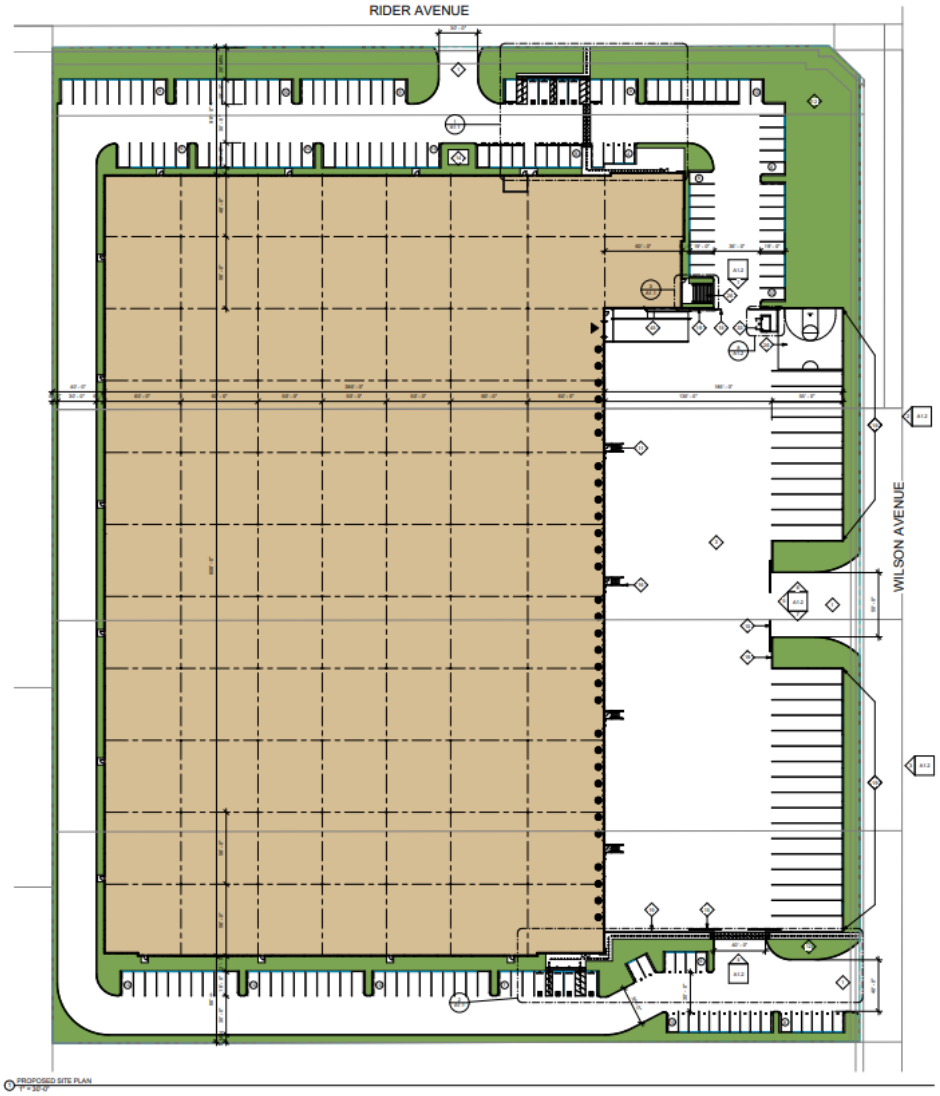
TSF = Thousand Square Feet

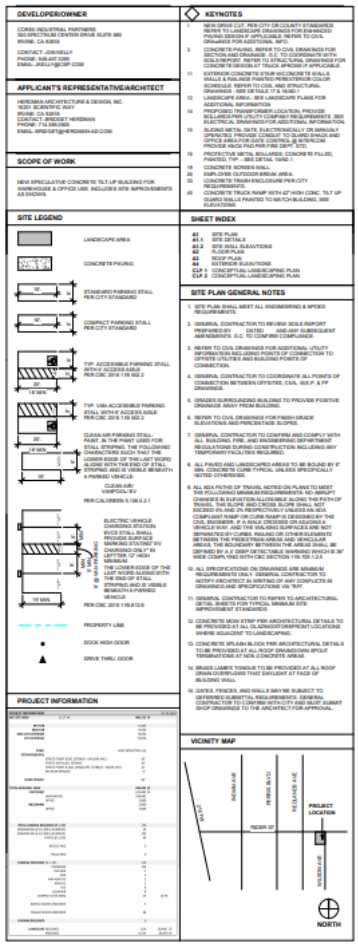
PCE = Passenger Car Equivalent

[1] Trip rates and truck percentages from the TUMF High-Cube Warehouse Trip Generation Study, January 29, 2019. Rate used is for Fulfillment Center. 2, 3 and 4 axle trucks were split as follows: 50% 4-axle, 33.3% 3-axle, and 16.7% 4-axle.

[2] Passenger Car Equivalent (PCE) factors from San Bernardino County CMP, Appendix B - Guidelines for CMP Traffic Impact Analysis Reports in San Bernardino County, 2016

Figure 1: Site Plan





CORE 5 INDUSTRIAL PARTNERS
PERRIS, CA

PROJECT
1st PLANNING SUBMITTAL

HERDMAN
ARCHITECTURE + DESIGN
A19-2122
08.14.2020

SITE PLAN

A1

Figure 2: Project Trip Distribution – Existing Conditions

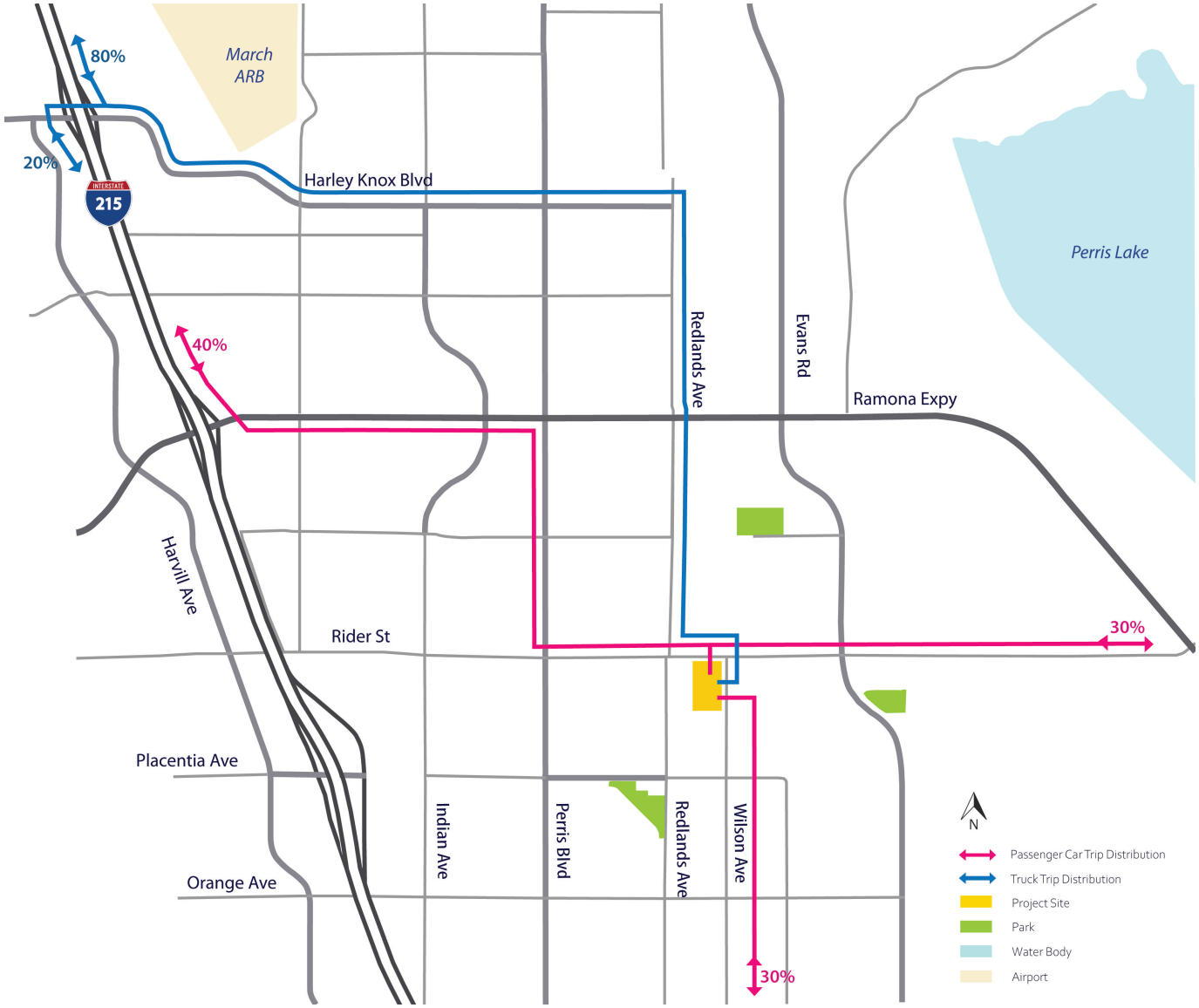
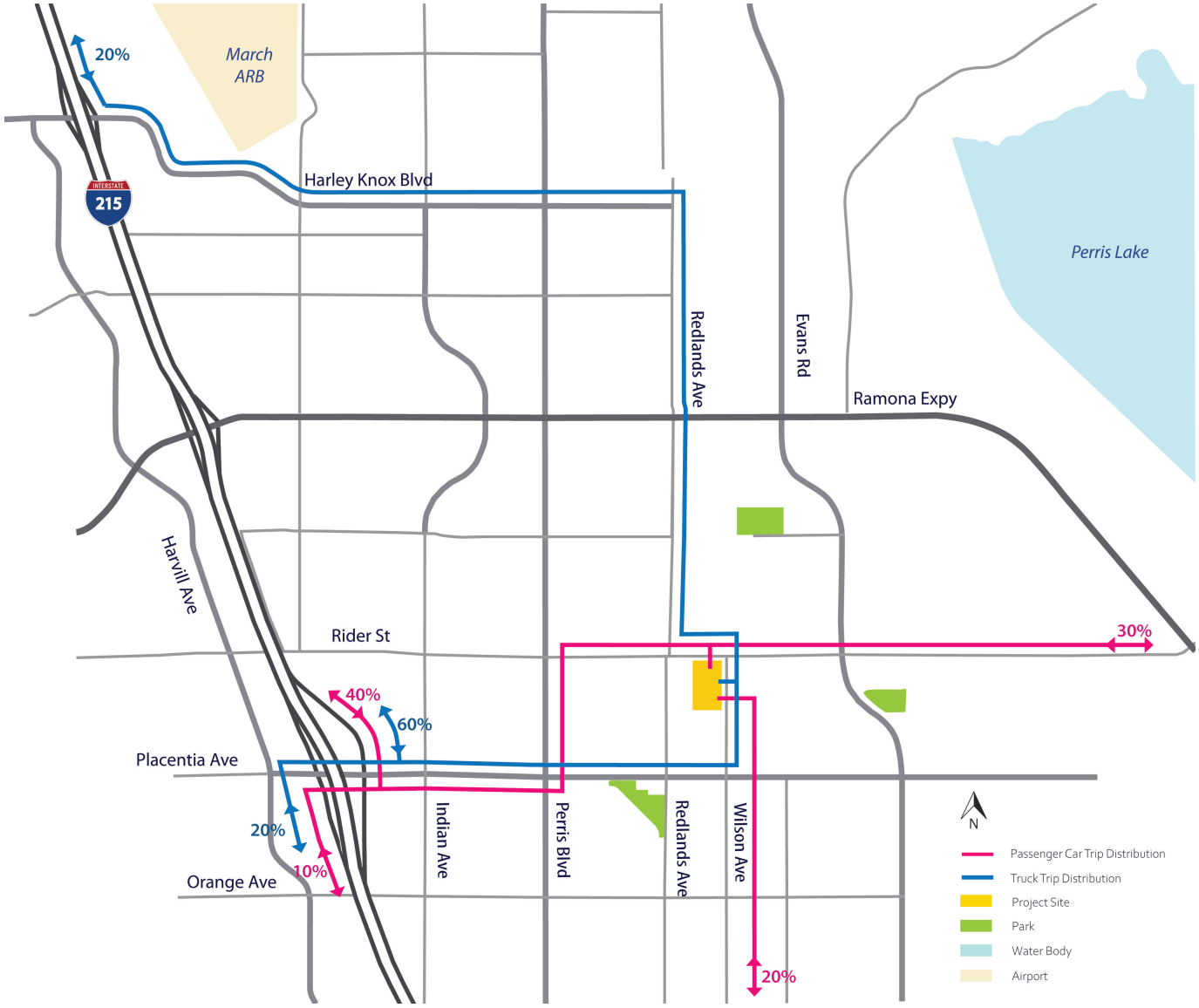


Figure 3: Project Trip Distribution – Opening Year Conditions



Technical Memorandum

To: Daniel Ramirez-Cornejo, Program Manager, WRCOG

From: Billy Park, Supervising Transportation Planner, WSP

Subject: **TUMF High-Cube Warehouse Trip Generation Study**

Date: January 29, 2019

Background

High-cube warehousing is emerging as an important development type in the Inland Empire. Studies such as Logistics & Distribution: *An Answer to Regional Upward Social Mobility*[1] and *Multi-County Goods Movement Action Plan*[2] suggests that this trend is likely to increase over time due to the Inland Empire's relative abundance of suitable sites compared to coastal counties.

A recurring analytical problem for the analyses of traffic impacts associated with proposed high-cube warehouses is the lack of reliable data regarding the number and vehicle mix of trips generated by this land development type. Specifically:

- The *2003 Fontana Truck Trip Generation Study*, which has been used for years by agencies in the Inland Empire, is based on the older type of high-cube warehouse. Newer warehouses generally are larger (often over 1 million square feet), much more automated, and generate far fewer trips per square foot.
- The use of overly-conservative estimates has produced results that were unreasonable when compared to actual field conditions. For example, the Environmental Impact Report (EIR) for the Skechers high-cube warehouse building in Moreno Valley included traffic forecasts that were substantially higher than the actual post-construction trip generation for both cars and trucks. Overstated forecasts are misleading to decision makers and could result in oversized infrastructure that could itself have environmental consequences, creates an undue burden on development, and could even have adverse legal consequences for the agencies involved.
- In 2011 the Commercial Real Estate Development Association, also known by its former acronym NAIOP, commissioned a trip generation study of high-cube warehouses focused on large highly-automated warehouses in the Inland Empire. NAIOP had hoped that their study, which found trip-gen rates considerably lower than previous studies, would be used in CEQA analyses going forward. However, concerns about potential bias by the sponsoring party have placed into question the validity of the study results. Similarly, a study commissioned by SCAQMD was viewed as possibly having an anti-development bias.
- Finally, in 2015 NAIOP and SCAQMD jointly sponsored a trip-gen study for high-cube warehouses through a respected neutral party, the Institute of Transportation Engineers (ITE). The report for this study, *High-Cube Warehouse Vehicle Trip Generation Analysis*, was completed in 2016.

The joint NAIOP/SCAQMD/ITE study resulted in a consensus on the trip generation rates to be used for the most common type of high-cube warehouse, a category they call "transload and short-term storage". The findings of the joint study generally indicated the trip generation rates for this use as being consistent with the trip generation rates for the broader category of high-cube warehouses as described by ITE in the 9th Edition of the *Trip*

[1] *Logistics & Distribution: An Answer to Regional Upward Social Mobility*, Dr. John Husing for SCAG, June 2004
[2] *Multi-County Goods Movement Action Plan*, Wilbur Smith Associates, August 2008

Generation Manual. However, the report did not settle the issue of trip generation rates for two other specific types of high-cube warehouses:

> *"The single data points for fulfillment centers and parcel hubs indicate that they have significantly different vehicle trip generation characteristics compared to other HCWs. However, there are insufficient data from which to derive useable trip generation rates."*

The purpose of this technical memorandum is to gather sufficient data to develop reliable trip generation rates for fulfillment centers and parcel hubs for use in traffic impact studies in the Inland Empire.

Methodology

Number of Sites: The study team reviewed ITE's *Trip Generation Handbook 2nd* Edition, Chapter 4 of which describes how to perform a trip generation study that meets ITE's standards (which improves the defensibility of the results if they are used for CEQA analyses). ITE recommends that at least three sites, and preferably five, be surveyed for a given land use category. Based on the review of candidate sites identified by Western Riverside Council of Governments (WRCOG) staff, it was recommended that data be collected at a total of 16 sites for the purposes of this study.

Independent Variables: ITE's Trip Generation Manual measures the size of proposed developments using more than a dozen different independent variables, such as students (for schools), acres (for parks), etc. All High-Cube related categories in both 9th and 10th Editions of the Trip Generation Manual are reported in Square Foot Gross Floor Area (GFA) measured in thousands of square feet (TSF), which is also the independent variable used for the TUMF program. Some other ITE employment categories use employment as the independent variable, as does SCAG in its Sustainable Communities Strategy. WRCOG provided GFA for all sites and employment data for eight fulfillment centers and one parcel hub site.

The ITE *Trip Generation Manual* typically reports trip generation rates two ways; namely as the average rate and using the "best fit" mathematical relationship between the number of trips generated and the independent variable. R-squared, also known as the coefficient of determination, is used to measure how well the best fit equations match the surveyed traffic counts. The *Trip Generation Manual* recommends that the best fit equation only be used when the R^2 is greater than or equal to 0.50 and certain other conditions being met; otherwise the average rate should be used.

Data Collection

WRCOG provided a list of recommended trip generation study sites after reviewing potential sites within the Inland Empire with its member agencies. The list included 11 fulfillment centers and 5 parcel hub sites as follows:

Fulfillment Centers

1. Walmart: 6750 Kimball Ave, Chino, CA 91708
2. Amazon: 24208 San Michele Rd, Moreno Valley, CA 92551
3. Lineage Logistics: 1001 Columbia Ave Riverside, CA 92507
4. P&G: 16110 Cosmos Street, Moreno Valley, CA 92551
5. Big 5: 6125 Sycamore Canyon Blvd, Riverside, CA 92507
6. Nestle USA: 3450 Dulles Drive, Jurupa Valley, CA
7. Home Depot: 11650 Venture Drive, Jurupa Valley, CA
8. ACT Fulfillment Center: 3155 Universe Drive, Jurupa Valley, CA
9. Petco: 4345 Parkhurst Street, Jurupa Valley, CA
10. Komer: 11850 Riverside Drive, Jurupa Valley, CA
11. Ross: 3404 Indian Ave Perris, CA 92571

Parcel Hubs

12. UPS: 15801 Meridian Pkwy, Riverside, CA 92518
13. FedEx: 330 Resource Dr, Bloomington, CA 92316
14. FedEx Freight: 12100 Riverside Drive, Jurupa Valley, CA
15. UPS Chain Logistics: 11811/11991 Landon Drive, Jurupa Valley, CA
16. DHL: 12249 Holly St N, Riverside, CA 92509

Traffic counts were collected at all of these sites. These were 72-hour driveway counts collected using video cameras for three-midweek days starting June 26, 2018. Video collection was determined to be preferable to collection data by means of machine counts, which can be problematic for driveways where vehicles are maneuvering at slow speeds. Video counts provide the ability for human viewers to review the captured footage to classify vehicles into 5 types (car, large 2-axle, 3-axle, 4-axle, and 5+ axle truck). The three-day average was calculated and used for the purposes of this study.

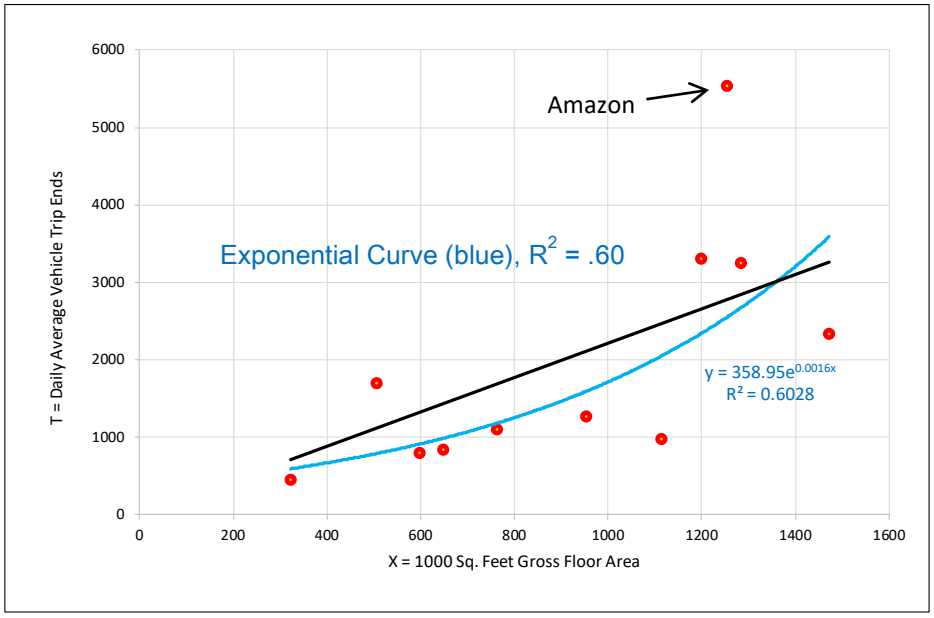
Fulfillment Centers

By Building Size

Exhibit 1 displays a data plot of daily vehicle trips for the 11 fulfillment centers against building size as the independent variable. The average trip generation rate for fulfillments centers (see black line in Exhibit 1) was found to be 2.2 trips/TSF, compared to the 1.4 trips/TSF found for conventional high-cube warehouses in the ITE/SCAQMD/NAIOP study (i.e. about 50% higher).

Exhibit 1 denotes one outlier data point representing the Amazon site in the upper right of the chart. As shown, the average daily trips generated at this facility is over 50% higher than the trips generated at the two sites of similar size (Walmart and Ross), which appears indicative of a greater frequency of same day e-commerce deliveries from Amazon to individual consumers.

Exhibit 1: Data Plot for Daily Total Vehicle Trip Ends against Building Size (Fulfillment Center)



The best fit equation was an exponential relationship with R^2 of 0.60 (i.e. high enough to meet the criteria of acceptability). This is shown as a blue line in Exhibit 1. An exponential relationship, meaning that the larger the

building the higher the trip generation rate, is quite unusual. Exhibit 2 takes a deeper look at this by showing the daily vehicle trip generation rates for each of the 11 surveyed fulfillment centers sorted by the smallest to the largest building size from left to right. As shown, small sites tend to generate fewer trips per thousand square feet, but higher percentage of trucks. On the other hand, largest sites tend to generate a higher number of car trips, but fewer truck trips. So not only is the overall trip generation rate affected by building size, the vehicle mix is affected as well.

Exhibit 2: Daily Vehicle Trip Generation Rates by Building Size for Each Fulfillment Center

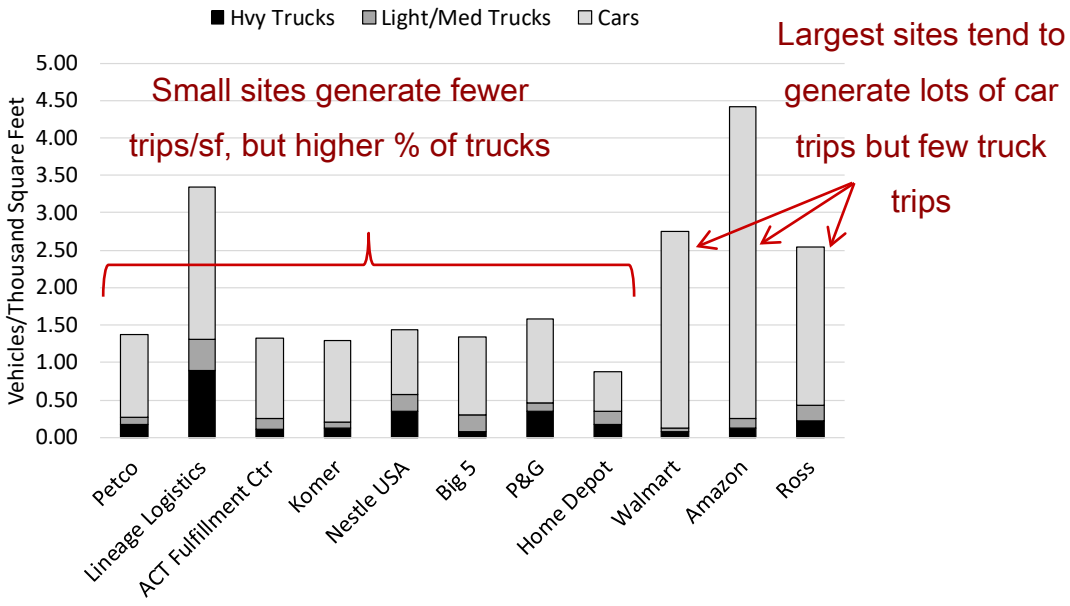


Exhibit 3 and Exhibit 4 show data plots for AM and PM peak hour vehicle trip ends against building size (respectively). The fitted curves had a low R^2, and so we recommend using the average rate.

Exhibit 3: Data Plot for AM Peak Hour Vehicle Trip Ends against Building Size (Fulfillment Center)

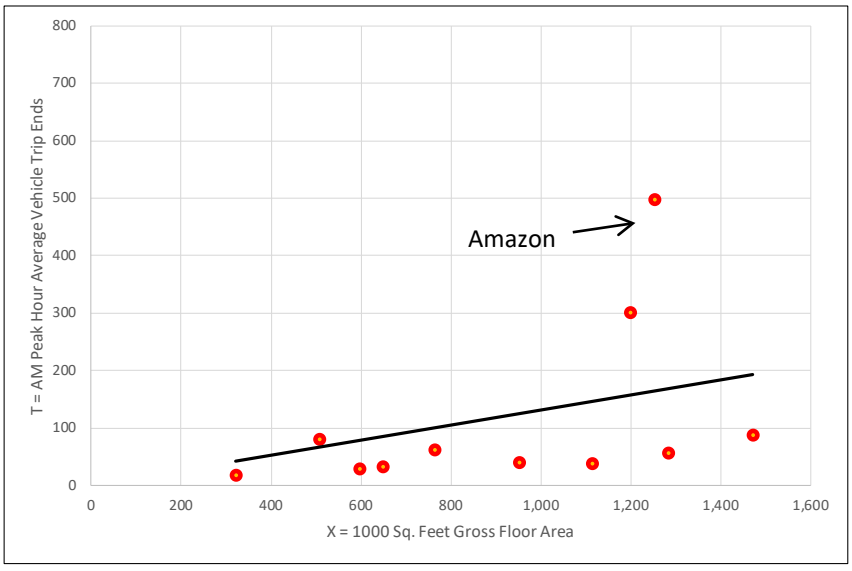


Exhibit 4: Data Plot for PM Peak Hour Vehicle Trip Ends against Building Size (Fulfillment Center)

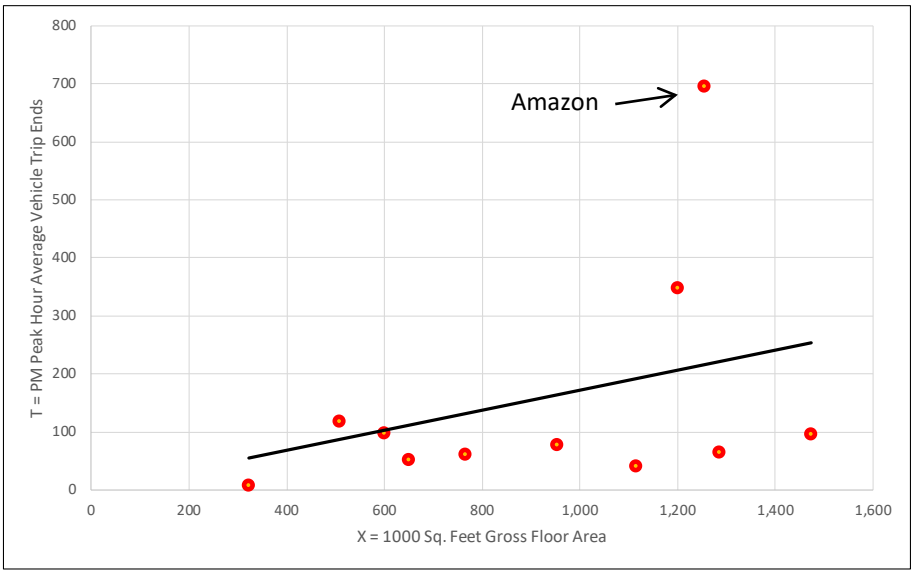
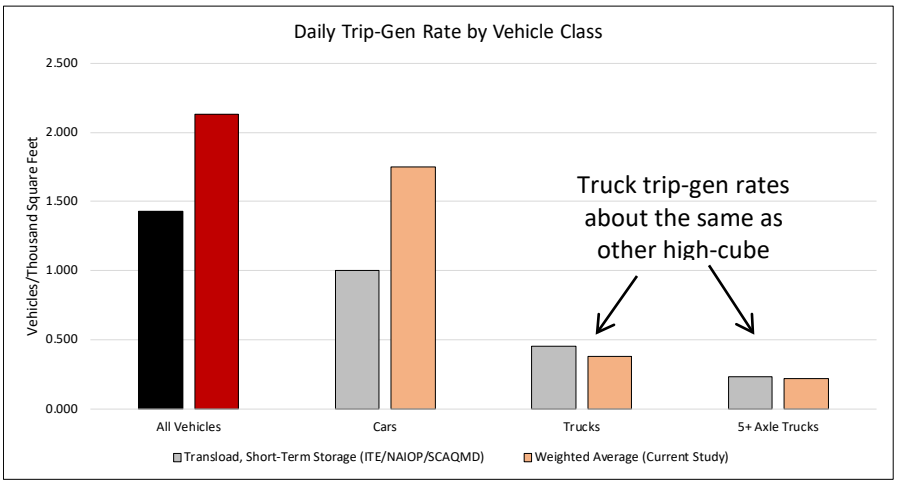


Exhibit 5 compares the average trip generation rates of 11 fulfillment centers with the rates found for conventional transload and short-term storage warehouses in the 2016 high-cube warehouse trip generation study[3] by SCAQMD/NAIOP/ITE. As shown, the fulfillment centers generate more daily vehicle trips than conventional warehouse facilities although trucks are roughly the same. This means that the additional trips by fulfillment centers are entirely due to additional car traffic, which is almost double the rate of car trips generated by conventional warehouses.

Exhibit 5: Conventional Warehouse vs Fulfillment Centers



Visual observation of the fulfillment center sites indicates the higher trip generation rates for cars appears to be mostly due to the use vans and passenger cars as delivery vehicles, particularly for the larger facilities operated by retailers such as Amazon and Walmart.

[3] *High-Cube Warehouse Vehicle Trip Generation Analysis*, Institute of Transportation Engineers, 2016

Exhibit 6 summarizes the AM and PM peak hour trip rates and the daily rates for fulfillment centers based on the findings of this study, and compares the results to rates for conventional transload and short-term storage warehouses.

Exhibit 6: Summary of Trip Generation Rates per Thousand Square Feet of Gross Floor Area for Fulfillment Centers

Vehicle Class	AM Peak Hour		PM Peak Hour		Daily	
	Conventional Warehouse*	Fulfillment Center	Conventional Warehouse	Fulfillment Center	Conventional Warehouse	Fulfillment Center
Cars	0.057	0.103	0.086	0.144	1.000	1.750
2-4 Axle Trucks	0.009	0.008	0.013	0.011	0.221	0.162
5-Axle Trucks	0.015	0.011	0.010	0.010	0.233	0.217
Total	0.082	0.122	0.108	0.165	1.432	2.129
% Higher than Conventional		49%		52%		49%

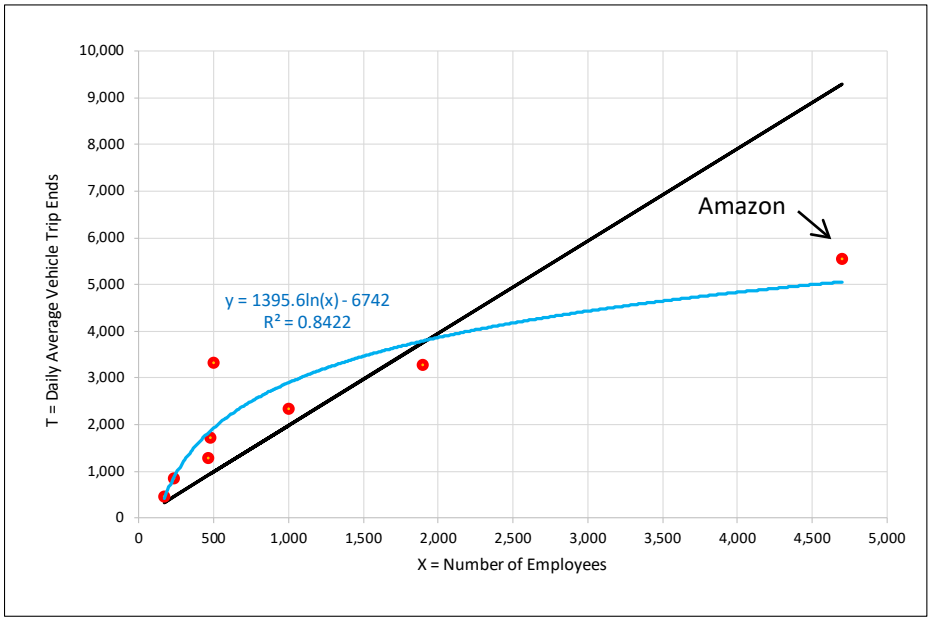
* Transload, Short-Term Storage category in 2016 TIE/ NAIOP/ SCAQMD study

By Employee

The WRCOG contacted the surveyed fulfillment centers and obtained employment data for eight of the eleven sites. Exhibit 7 shows a data plot for those eight sites for daily total vehicle trip ends against the number of employees. The best fit equation was logarithmic function which had an R^2 of 0.84, indicating a very good fit. Notably, the Amazon site, which was an outlier for trip generation based on floor area (see Exhibit 1), correlates more closely to other sites when employment is used instead. The average trip generation rate for fulfillments centers (represented by the black line in Exhibit 7) was found to be 2.0 trips/TSF

No comparison was made to any previous rates per employees because none of the previous high-cube warehouse related trip generation studies included correlation of trips with employment data.

Exhibit 7: Data Plot for Daily Total Vehicle Trip Ends against Employee (Fulfillment Center)



The data plots for the AM and PM peak hour total vehicle trip ends against the number of fulfillment center employees are shown in Exhibit 8 and Exhibit 9. The best fit equations are linear regressions (shown with black lines) which show a good R^2 for both the AM and PM peak periods.

Exhibit 8: Data Plot for AM Peak Hour Total Vehicle Trip Ends against Employee (Fulfillment Center)

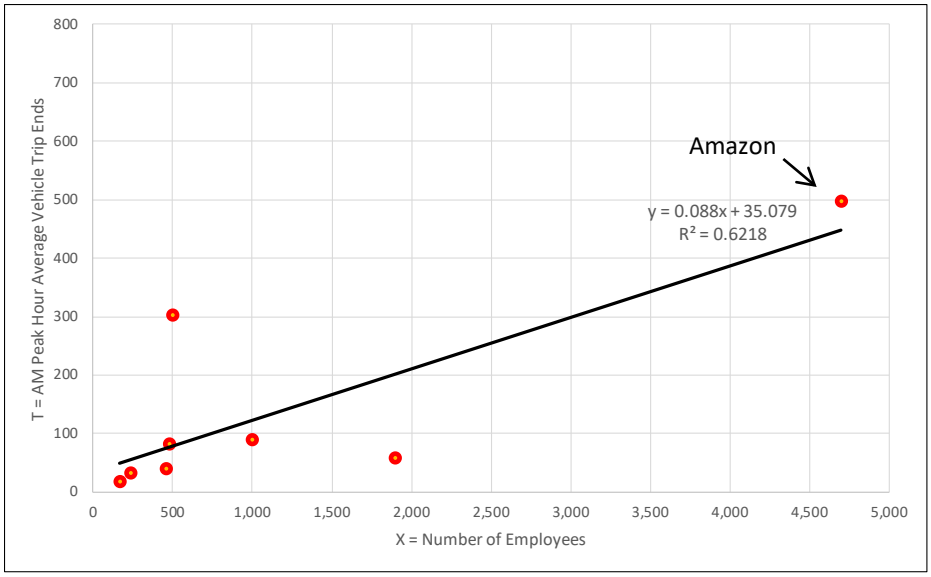


Exhibit 9: Data Plot for PM Peak Hour Total Vehicle Trip Ends against Employee (Fulfillment Center)

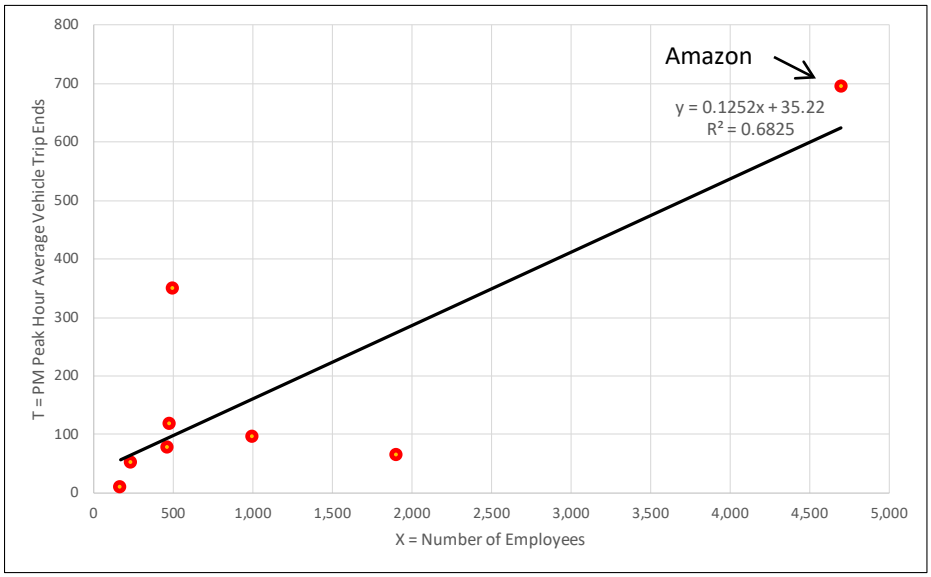


Exhibit 10 summarizes the AM and PM peak hour trip rates and the daily rates for trip generation per employee at fulfillment centers based on the findings of this study.

Exhibit 10: Summary of Trip Generation Rates per Employee for Fulfillment Centers

Vehicle Class	AM Peak Hour	PM Peak Hour	Daily
Cars	0.102	0.139	1.673
2-4 Axle Trucks	0.006	0.008	0.125
5-Axle Trucks	0.009	0.008	0.178
Total	0.118	0.155	1.977

Parcel Hubs

By Building Size

Exhibit 11 displays daily vehicle trip generation rates by building size for each of five parcel hub sites. They are sorted by the smallest to the largest building size from left to right. In this case the small sites generate significantly more trips of every kind than the larger sites, which is the opposite to the pattern observed for fulfillment centers.

Exhibit 11: Daily Trip Generation Rates at Parcel Hubs

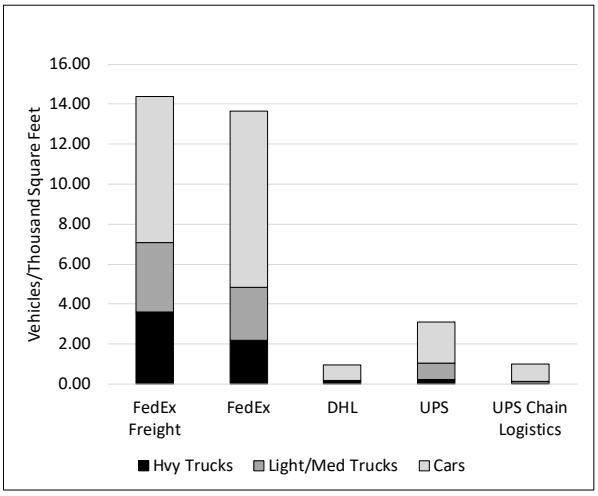


Exhibit 12 shows a data plot of daily vehicle trips of five parcel hubs against building size. As shown, a linear best fit was negative. During the collection of traffic data, construction activity was observed at the FedEx site potentially tainting the validity of these data to represent typical trip generation characteristics. To determine if the trip generation at this site was contributing to the poor data correlation, Exhibit 13 displays the same daily data plot without the FedEx site. The linear best fit shows a positive slope, but remains almost flat effectively indicating no correlation between the daily trips and building size based on the analysis of these sites.

The basic premise of the ITE trip generation approach is that the number of trips generated by a project is proportional to its size. That premise does not hold true for the parcel hubs in this sample and so no meaningful trip generation rates could be determined based on the data collected in support of this study. It should be recognized that a sample size of four or five sites represents the minimum recommended by ITE for valid trip generation studies, and for this reason, it is recommended that additional sites would need to be investigated and included in the data set to develop a more definitive finding on trip generation rates. Furthermore, it may be appropriate to determine the specific function at each site, due to the disparity between the rates observed at the FedEx sites versus the other three sites. It is likely that the function served by the respective sites is significantly different, as reflected in the trip generation rates, thereby necessitating reclassification of these uses for comparative purposes.

Exhibit 12: Data Plot for Daily Total Vehicle Trip Ends against Building Size (Parcel Hubs)

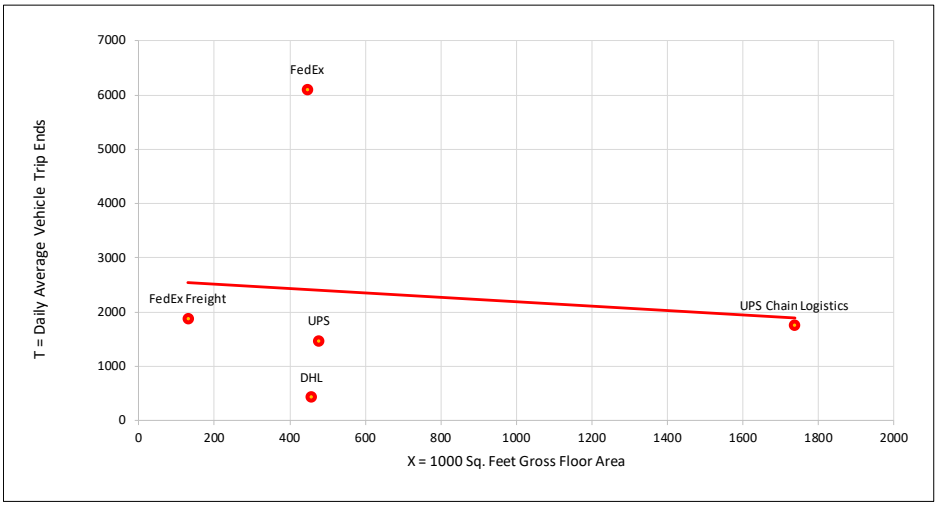
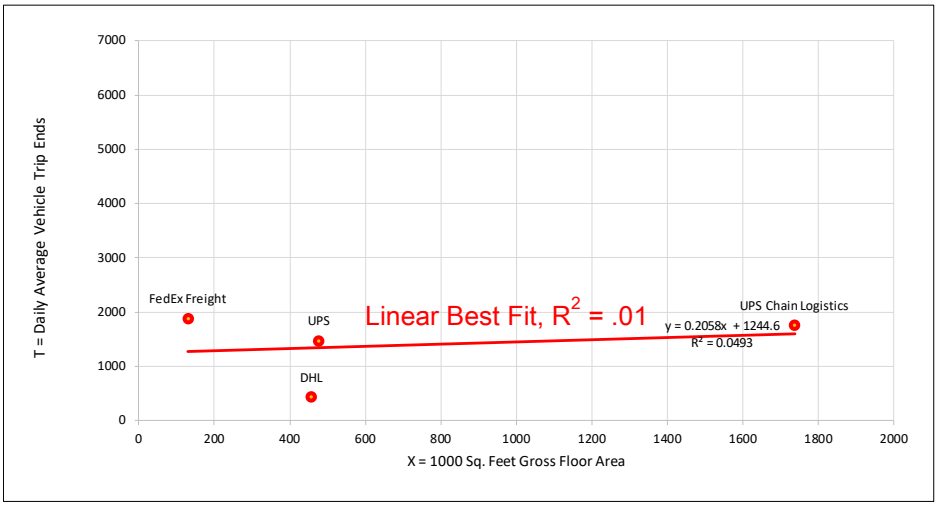


Exhibit 13: Data Plot for Daily Vehicle Trip Ends against Building Size without Construction Site



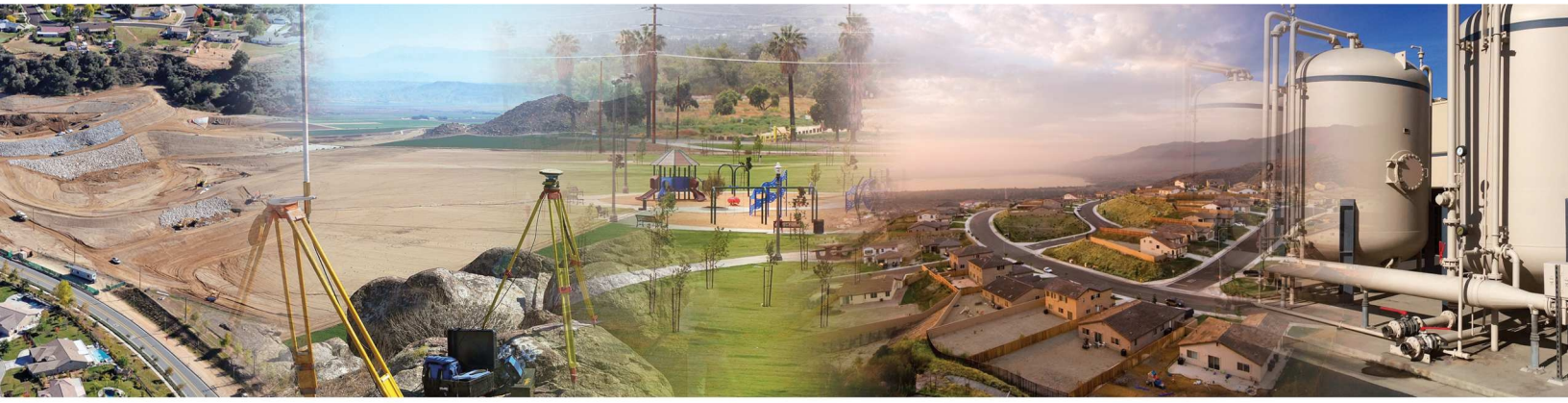
Conclusions

Our survey of 11 fulfillment centers produced trip generation rates based on the gross floor area of the sites that satisfies ITE's standards for use. The findings of the study indicate that the daily trip generation rates for fulfillment centers is approximately 2.1 trips per thousand square feet of gross floor area, which is roughly 50% higher than the comparable rate for conventional transload and short term storage warehouses previously defined in the ITE *Trip Generation Manual* Version 10. The results of the study further indicate that the higher rates were entirely due to more cars traffic at these sites; the trip generation rates for trucks was found to comparable to those at conventional warehouses.

Employment data were available for eight out of 11 fulfillment center sites. This provided the ability to determine trip generation rates per employee. The study results indicate that that trip generation for fulfillment centers is approximately 2.0 trips per employee. The study also found that the trip generation rate per employee correlated more closely that the trip generation rate per thousand square feet of gross floor area.

The data from the five parcel hubs did not show any statistically meaningful relationship between trips and building size. Therefore, no trip generation rate could be calculated. However, the data collected at these sites may provide a useful basis for further comparison with additional sites to provide more data points for analysis.

ALBERT A. WEBB ASSOCIATES



RIDER-REDLANDS WAREHOUSE PROJECT TRAFFIC IMPACT ANALYSIS PLN19-00016

July 2020

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July 31, 2020

Michael Goodwin
First Industrial Realty Trust
898 N. Sepulveda Boulevard, Suite 175
El Segundo, CA 90245

RE: Traffic Impact Analysis Report for PLN19-00016, Rider-Redlands Warehouse site in the City of Perris, CA.

Dear Michael,

We are pleased to submit herewith our Traffic Impact Analysis Report for the proposed PLN19-00016, Rider-Redlands Warehouse Project, which we have prepared at your request.

If you have any questions regarding this report, please call the undersigned for clarification.

Sincerely yours,

ALBERT A. WEBB ASSOCIATES

Nicholas Lowe, P.E.
Senior Engineer

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I. EXECUTIVE SUMMARY

Study Objectives

This study evaluates the potential effects on traffic circulation from a proposed industrial development at the intersection of Rider Street and Redlands Boulevard in the City of Perris. This study's objectives include:

- Document existing traffic conditions (2019) in the vicinity of the proposed development (study area);
- Determine the expected project traffic generation;
- Evaluate opening-day traffic scenarios for intersection levels of service (LOS), including ambient growth and cumulative projects;
- Evaluate alternative future roadway network traffic scenarios for intersection LOS;
- Determine if the LOS required by the City of Perris will be maintained within the study area—
    - if not, determine the mitigation measures needed to maintain the required LOS; and
- Determine if peak-hour traffic signal warrants are met for any unsignalized study intersections.

Prior to conducting this study, the City of Perris gave input on and approval of the study scope (**Appendix A**).

Project Description

The proposed project site is located on the southeast corner of the intersection of Rider Street and Redlands Avenue in north Perris, east of the Interstate 215 (I-215) freeway and south of Ramona Expressway. The project proposes to construct a 324,147 square-foot warehouse, along with associated parking and loading facilities as well as required improvements to the project frontage. Project access is proposed via three new driveways: two on Redlands Avenue and one on Rider Street.

Project Trip Generation

Based on the proposed site plan and trip generation rates from the Institute of Transportation Engineers (ITE), the project is expected to generate approximately 564 daily vehicle trips, with 56 trips in the AM peak hour and 62 trips in the PM peak hour. Since the project consists of industrial warehousing, about 20-30% of these vehicle trips are expected to be large trucks. Using studies and data from the ITE, South Coast Air Quality Management District (SCAQMD), and San Bernardino County Transportation Authority (SBCTA), the expected project traffic in passenger-car equivalent (PCE) rates is approximately 844 daily trips, with 84 trips in the AM peak hour and 83 trips in the PM peak hour.

Analysis and Findings

Acceptable Level of Service Standards

Per the City of Perris General Plan and traffic operational standards, the minimum acceptable LOS at intersections is LOS D with the exception of intersections of any arterials and expressways with SR-74, Ramona-Cajalco Expressway, and I-215 ramps. These intersections have a minimum acceptable LOS of LOS E. In addition, intersections within the Downtown Specific Plan Area have a target LOS of LOS E.

Level of Service Findings

The intersection of Rider Street and Wilson Avenue currently operates under deficient LOS conditions in both the AM and PM peak hours (**Section 4**), and is expected to continuing operating below the minimum acceptable LOS once the project is completed. All other study intersections are expected to operate above the minimum acceptable LOS in all study scenarios. See **Sections 4-6** or **Appendix D** for details.

Traffic Signal Warrants

The unsignalized study intersection of Rider Street and Wilson Avenue currently operates below the City's minimum LOS standard. Accordingly, as a preliminary step in assessing the need for and feasibility of a new traffic signal, this study found that this intersection currently meets the peak-hour traffic signal warrant as outlined in the California Manual on Uniform Traffic Control Devices (MUTCD). Likewise, it is anticipated that this intersection would continue to meet the peak-hour traffic signal warrant under project opening day and future buildout conditions. For details, see **Section 7** or **Appendix F**.

Besides the peak-hour traffic signal warrant (Warrant 3), the MUTCD provides a total of nine warrant guidelines for a traffic signal, and the satisfaction of any single warrant does not require the installation of a traffic signal. The peak-hour traffic signal warrant analysis is only an indicator that an intersection is likely to meet one or more of the other volume-based signal warrants. An engineering study should be conducted to determine that installing a traffic control signal will improve the overall safety and/or operation of the intersection and not seriously disrupt progressive traffic flow.

Proposed Improvements

Project Design Features

- Construct partial-width improvements on east side of Redlands Avenue adjacent to project site.
- Signing/striping should be implemented along with detailed construction plans for the project site.
- Sight distance at the project driveways will be reviewed with respect to City of Perris standards at the time of preparation of final grading, landscape, site development, and street improvement plans.

Recommended Offsite Improvements

- Provide fair-share contribution towards the installation of a new traffic signal at the intersection of Rider Street and Wilson Avenue. This may require an engineering study, traffic signal design plans, and/or traffic signal timing and phasing plans.

Project Fair Share Contribution

Should the City of Perris determine that a new traffic signal is to be installed at the intersection of Rider Street and Wilson Avenue, the project would participate in the cost of off-site improvements through the payment of "fair share" mitigation fees in accordance with the anticipated proportion of project impact to traffic conditions at this intersection.

II. INTRODUCTION

Study Objectives

This study evaluates the potential effects on traffic circulation from a proposed industrial development at the intersection of Rider Street and Redlands Boulevard in the City of Perris. This study's objectives include:

- Document existing traffic conditions (2019) in the vicinity of the proposed development (study area);
- Determine the expected project traffic generation;
- Evaluate opening-day traffic scenarios for intersection levels of service (LOS), including ambient growth and cumulative projects;
- Evaluate alternative future roadway network traffic scenarios for intersection LOS;
- Determine if the LOS required by the City of Perris will be maintained within the study area—
    - if not, determine the mitigation measures needed to maintain the required LOS; and
- Determine if peak-hour traffic signal warrants are met for any unsignalized study intersections.

Prior to conducting this study, the City of Perris gave input on and approval of the study scope (**Appendix A**).

Project Location and Description

The proposed project site is located on the southeast corner of the intersection of Rider Street and Redlands Avenue in north Perris, east of the Interstate 215 (I-215) freeway and south of Ramona Expressway. The site is currently vacant and zoned for commercial/industrial use.

The project proposes to construct a 324,147 square-foot warehouse (**Figure 1**), along with associated parking and loading facilities as well as required improvements to the project frontage. Project access is proposed via three new driveways: two on Redlands Avenue and one on Rider Street. The project driveway on Rider Street is proposed to provide full access for passenger vehicles, while restricting trucks to right-in/left-out only. On Redlands Avenue, the north driveway is proposed to be restricted to right turns only for all vehicles, while trucks at the south driveway are proposed to be restricted to left-in/right-out only.

This study assumes that the project would be fully developed in a single phase, to be completed and operational in the year 2022.

Study Intersections

Based on a review of the existing roadway network and anticipated project traffic, the following study intersections were selected for analysis in conjunction with the City:

1. East project driveway @ Rider Street
2. North project driveway @ Redlands Avenue
3. South project driveway @ Redlands Avenue
4. Rider Street @ Perris Boulevard
5. Rider Street @ Redlands Avenue
6. Rider Street @ Wilson Avenue

Figure 2 shows the study area and study intersection locations.

Figure 1: Proposed Project Site Plan

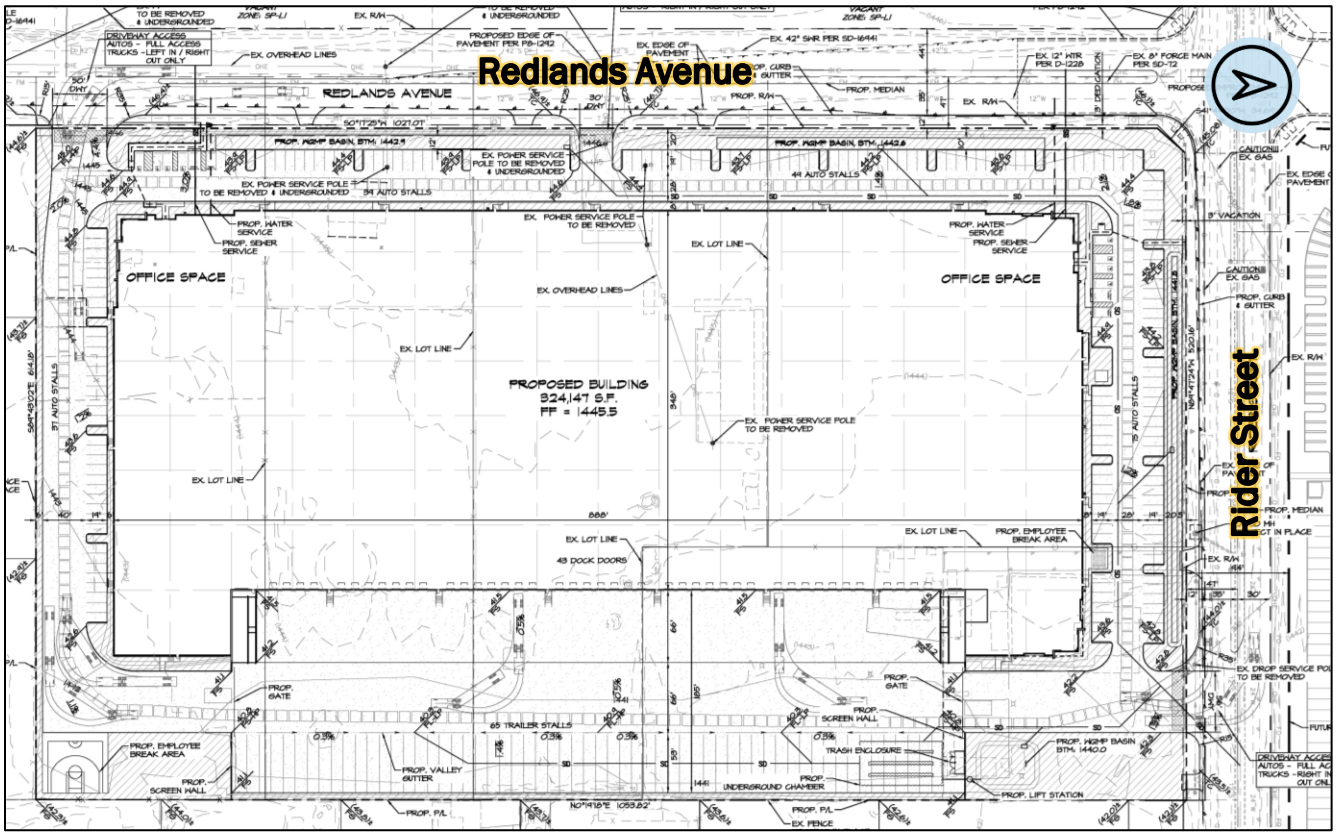


Figure 2: Study Intersections

Analysis Methodology

Per Riverside County guidelines, this study uses methodology from the most recent Transportation Research Board *Highway Capacity Manual* to analyze traffic operations via Level of Service (LOS) rankings. Accordingly, the *Highway Capacity Manual* 6th Edition (HCM6, 2016) was used to perform intersection LOS analysis for the following scenarios:

- Existing conditions (2019)
  - No project traffic
  - With project traffic
- Opening Day conditions (existing traffic + ambient growth + nearby development traffic, 2022)
  - No project traffic
  - With project traffic
- Opening Day alternative roadway network (with Placentia interchange)
  - With project traffic

LOS measures transportation quality of service from the traveler's perspective. Per the HCM6, LOS rankings at intersections use a letter-grade scale ranging from LOS A (optimal conditions) to LOS F (congested or overcrowded conditions) based on average control delay in seconds per vehicle, or how long a vehicle typically waits before proceeding through the intersection. This delay is compared with free-flow conditions, and includes slowing before an intersection, waiting in queues, and stopping at the intersection. This study uses Vistro traffic modeling software to evaluate LOS at both signalized and unsignalized intersections.

For signalized and all-way stop-controlled intersections, LOS rankings are based on the average control delay of all vehicles passing through the intersection. For two-way or side-street stop-controlled intersections, LOS rankings are based on the highest average control delay of all controlled movements. Table 1 and 2 show the LOS delay thresholds for signalized and unsignalized intersections, respectively.

Table 1: Level of Service at Signalized Intersections

Control Delay (sec/vehicle)	Level of Service	Description
0 - 10	A	Minimal delay and primarily free-flow operation. Most vehicles do not stop or only stop for a brief amount of time.
10 - 20	B	Short delay and reasonably unimpeded operation. Many vehicles do not stop or only stop for a short time. More vehicles stop than with LOS A.
20 - 35	C	Moderate delay and stable operation. Individual cycle failures may begin to appear. The number of vehicles stopping is significant.
35 - 55	D	Less stable operation; small increases in vehicles may cause substantial increases in delay. Many vehicles stop, individual cycle failures noticeable.
55 - 80	E	Significant delay and unstable operation. Most vehicles stop and individual cycle failures are frequent.
80 +	F	Considerable delay and extensive queuing. Almost all vehicles stop and most cycles fail to clear the queue.

Source: Transportation Research Board, Highway Capacity Manual 6 (2016)

Table 2: Level of Service at Unsignalized Intersections

Control Delay (sec/vehicle)	Level of Service	Description
0 - 10	**A**	Minimal delay. Usually no conflicting traffic.
10 - 15	**B**	Short delay. Occasionally some conflicting traffic.
15 - 25	**C**	Noticeable delay, but not inconveniencing. Usually some conflicting traffic.
25 - 35	**D**	Noticeable delay and irritating. A significant amount of conflicting traffic. Increased likelihood of risk taking.
35 - 50	**E**	Significant delay approaching tolerance level. Lots of conflicting traffic, with some gaps of suitable size. Risk taking behavior likely.
50 +	**F**	Considerable delay exceeding tolerance level. Lots of conflicting traffic, with not enough gaps of suitable size. High likelihood of risk taking.

Source: Transportation Research Board, Highway Capacity Manual 6 (2016)

Level of Service Standards

Per the City of Perris General Plan and traffic operational standards, the minimum acceptable LOS at intersections is LOS D with the exception of intersections of any arterials and expressways with SR-74, Ramona-Cajalco Expressway, and I-215 ramps. These intersections have a minimum acceptable LOS of LOS E. In addition, intersections within the Downtown Specific Plan Area have a target LOS of LOS E.

Significant Impact and Mitigation Criteria

The project's potential traffic impacts are evaluated per the City's minimum acceptable LOS standards, as well as the County of Riverside Traffic Impact Analysis Guidelines. For this study, the expected project traffic impacts at both signalized and unsignalized intersections are considered significant under the following conditions:

- At intersections with a pre-project LOS at or above LOS D, the addition of project traffic is anticipated to result in LOS E or F operations.
- At intersections with a pre-project LOS E or F, the addition of project traffic is anticipated to further degrade to a lower LOS (e.g. LOS E to F).

Additionally, the project traffic impact at an unsignalized intersection is considered significant if the addition of project traffic is anticipated to result in the intersection meeting the peak-hour traffic signal warrant as described in the California Manual on Uniform Traffic Control Devices (MUTCD).

Accordingly, traffic mitigation measures will be assessed in order to bring any intersection with deficient LOS operations to acceptable LOS standard or better; if this is infeasible, mitigation measures should at least return the intersection(s) to pre-project LOS conditions.

III. PROPOSED PROJECT TRAFFIC

This study uses a multi-step process to estimate project traffic. First, project trip generation estimates the total arriving and departing traffic during a typical weekday and the weekday peak hours by applying the appropriate vehicle trip generation rates to the project development tabulation. Next, trip distribution identifies the origins and destinations of project traffic based on existing and expected future travel patterns. Finally, traffic assignment allocates the distributed project traffic to specific roadways and intersections.

Project Trip Generation

Trip Generation Rates

Trip generation represents the amount of traffic accessing a site, differentiated by inbound and outbound vehicle trip ends. The Institute of Transportation Engineers (ITE) *Trip Generation Manual* 10th Edition (2017) uses thousands of studies across the nation to determine common trip generation characteristics by land use. Using the *Manual*, the anticipated project trip generation was determined using trip generation rates given by ITE Land Use Code #150 (Warehousing).

Since warehouses operate via large trucks, specialized trip generation studies have also been conducted by both ITE and the Southern California Air Quality Management District. From these studies, average truck fleet mix percentages can be applied to the vehicle trip generation rates to determine the amount of 2-, 3-, and 4+-axle trucks expected to access the project. Finally, the truck trips are weighted by the County of San Bernardino passenger-car equivalent (PCE) from the 2016 County Congestion Management Program update.

Table 3 shows the trip generation rates used in this study, in both raw vehicle trips and PCE trips.

Trip Generation

The trip generation volumes are developed by multiplying the trip generation rates by the square footage of the project. It is also common to deduct the trip generation for existing land uses at the project site to calculate net new project traffic. However, as the project site is currently vacant, no existing trip credits were deducted for this study. Accordingly, the proposed project is expected to generate approximately **844 daily PCE trips, with 84 PCE trips in the AM peak hour and 83 PCE trips in the PM peak hour** (**Table 4**).

Project Trip Distribution and Assignment

Modal Split

Based on the industrial nature of the project and its distance from existing public transit stops, no project traffic reductions from transit use or active transportation (bicycling or walking) are considered in this study.

Trip Distribution

Trip distribution, or the directional orientation of project traffic, is based on the project's driveway geometrics, geographical location, nearby land uses, and proximity to the regional freeway system. The analyzed project trip distribution for passenger vehicles and trucks are shown in **Figures 3 and 4**, respectively. Although the ultimate project driveway geometrics and turn restrictions may differ slightly from the analysis, traffic patterns are still expected to follow the major adjacent roadways.

Table 3: Trip Generation Rates

Vehicle Type	PCE Factor[1]	Estimated Mix[2]			Units[3]	Daily	AM Peak Hour			PM Peak Hour		
		Daily	AM	PM			In	Out	Total	In	Out	Total
Trip Generation Rates (classification, non-PCE) [4]												
Passenger Cars	1	67.8%	69.2%	78.3%	KSF	1.18	0.091	0.027	**0.118**	0.040	0.109	**0.149**
2-Axle Trucks	1.5	5.4%	5.2%	3.6%		0.09	0.007	0.002	**0.009**	0.002	0.005	**0.007**
3-Axle Trucks	2	6.7%	6.4%	4.5%		0.12	0.008	0.003	**0.011**	0.002	0.006	**0.008**
4-Axle Trucks	3	20.1%	19.2%	13.6%		0.35	0.025	0.008	**0.033**	0.007	0.019	**0.026**
Total		**100%**	**100%**	**100%**		**1.74**	**0.131**	**0.039**	**0.17**	**0.051**	**0.139**	**0.19**
Calculated Trip Generation Rates (PCE)												
Passenger Cars	1	67.8%	69.2%	78.3%	KSF	1.18	0.091	0.027	**0.118**	0.040	0.109	**0.149**
2-Axle Trucks	1.5	5.4%	5.2%	3.6%		0.14	0.011	0.003	**0.014**	0.003	0.008	**0.011**
3-Axle Trucks	2	6.7%	6.4%	4.5%		0.24	0.016	0.006	**0.022**	0.004	0.012	**0.016**
4-Axle Trucks	3	20.1%	19.2%	13.6%		1.05	0.075	0.024	**0.099**	0.021	0.057	**0.078**
Total		**100%**	**100%**	**100%**		**2.61**	**0.193**	**0.060**	**0.253**	**0.068**	**0.186**	**0.254**

[1] PCE factors per San Bernardino County Transportation Authority

[2] High-Cube Warehouse Vehicle Trip Generation Analysis, ITE (2017); Warehouse Truck Trip Study, SCAQMD (2014)

[3] KSF = 1,000 square feet gross floor area

[4] ITE Trip Generation Manual 10th Ed, 2017 - Land Use 150, Warehousing

Table 4: Project Trip Generation

Vehicle Type	PCE Factor[1]	Units[2]	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Proposed Project Trip Generation (classification, non-PCE)									
Passenger Cars	-	324 KSF	382	29	9	**38**	13	35	**48**
2-Axle Trucks	-		30	2	1	**3**	1	2	**3**
3-Axle Trucks	-		39	3	1	**4**	1	2	**3**
4-Axle Trucks	-		113	8	3	**11**	2	6	**8**
Total			**564**	**42**	**14**	**56**	**17**	**45**	**62**
Passenger Car Equivalent (PCE) Project Trip Generation									
Passenger Cars	1	324 KSF	382	29	9	**38**	13	35	**48**
2-Axle Trucks	1.5		45	3	2	**5**	2	3	**5**
3-Axle Trucks	2		78	6	2	**8**	2	4	**6**
4-Axle Trucks	3		339	24	9	**33**	6	18	**24**
Total			**844**	**62**	**22**	**84**	**23**	**60**	**83**

[1] PCE factors per San Bernardino County Transportation Authority

[2] KSF = 1,000 square feet gross floor area

Figure 3: Directional Distribution of Project Traffic (Passenger Cars)

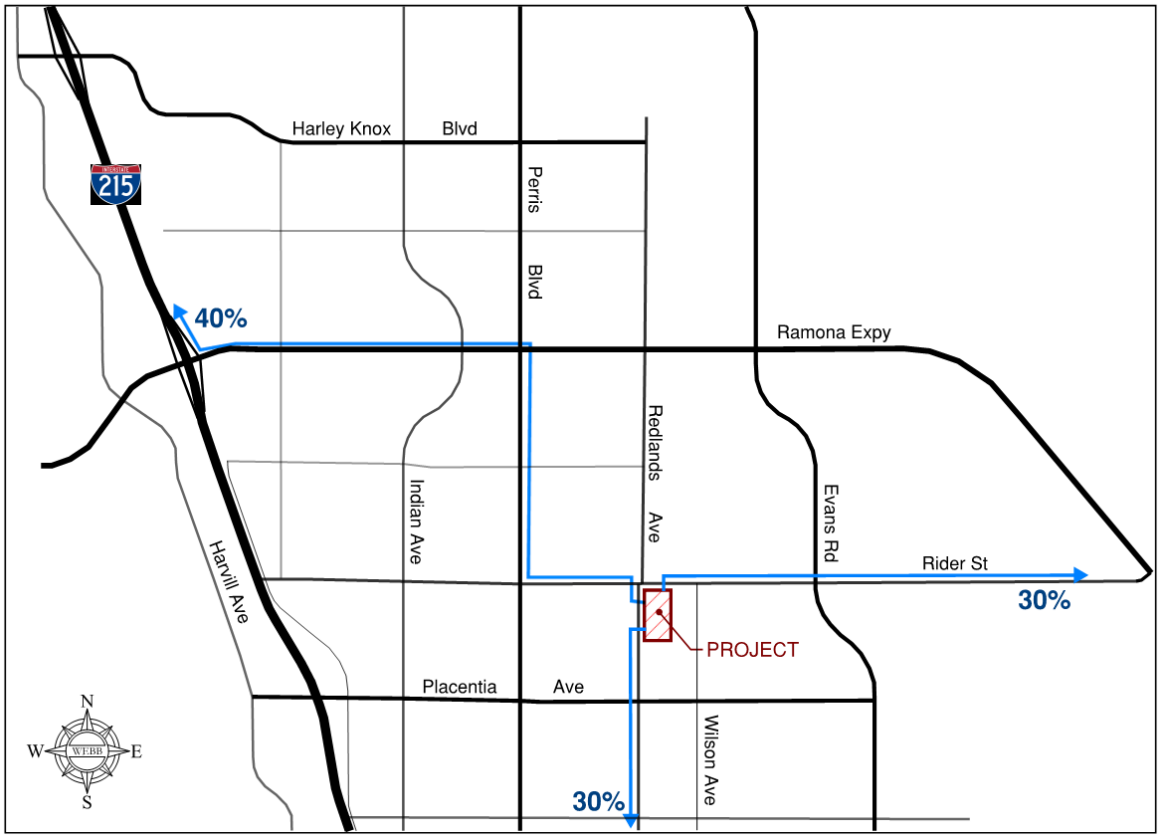


Figure 4: Directional Distribution of Project Traffic (Trucks)

Trip Assignment

Based on expected project trip generation, the trips are assigned to specific roadways and intersections according to the trip distribution model. **Figures 5 and 6** show the project trips at the study intersections for the AM and PM peak hours, respectively. Since the project trip generation is relatively low, adjustments to the driveway configurations or trip distribution are not expected to significantly change these volumes.

Figure 5: Project Traffic Volumes (PCE) – AM Peak Hour

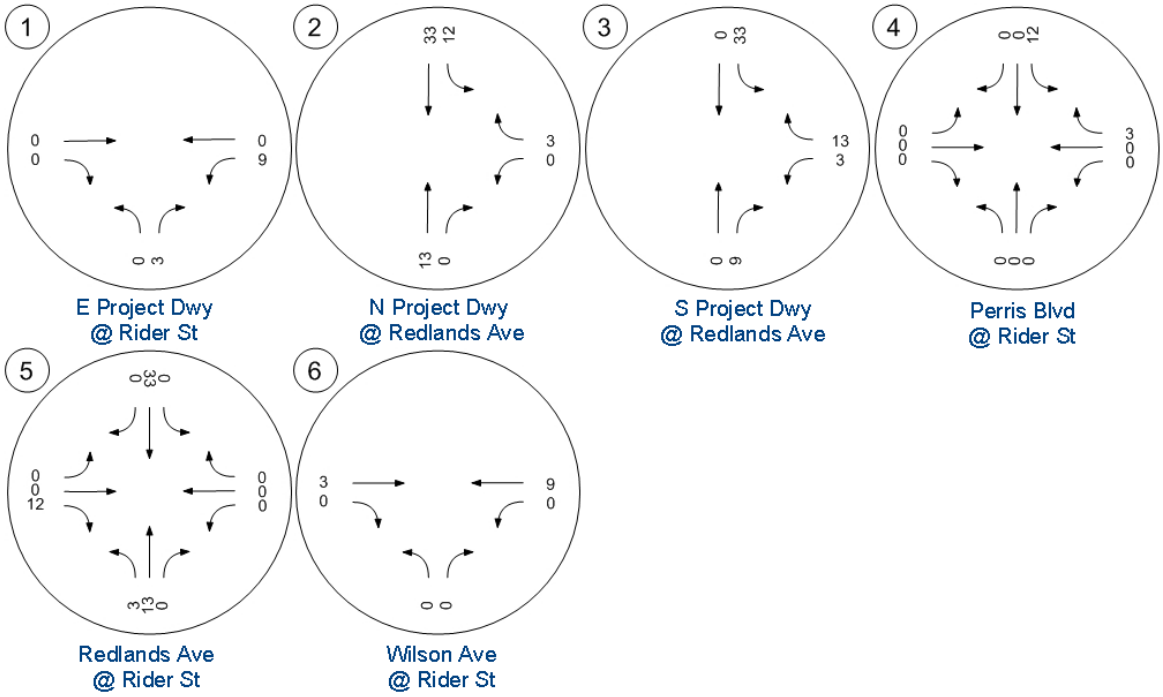
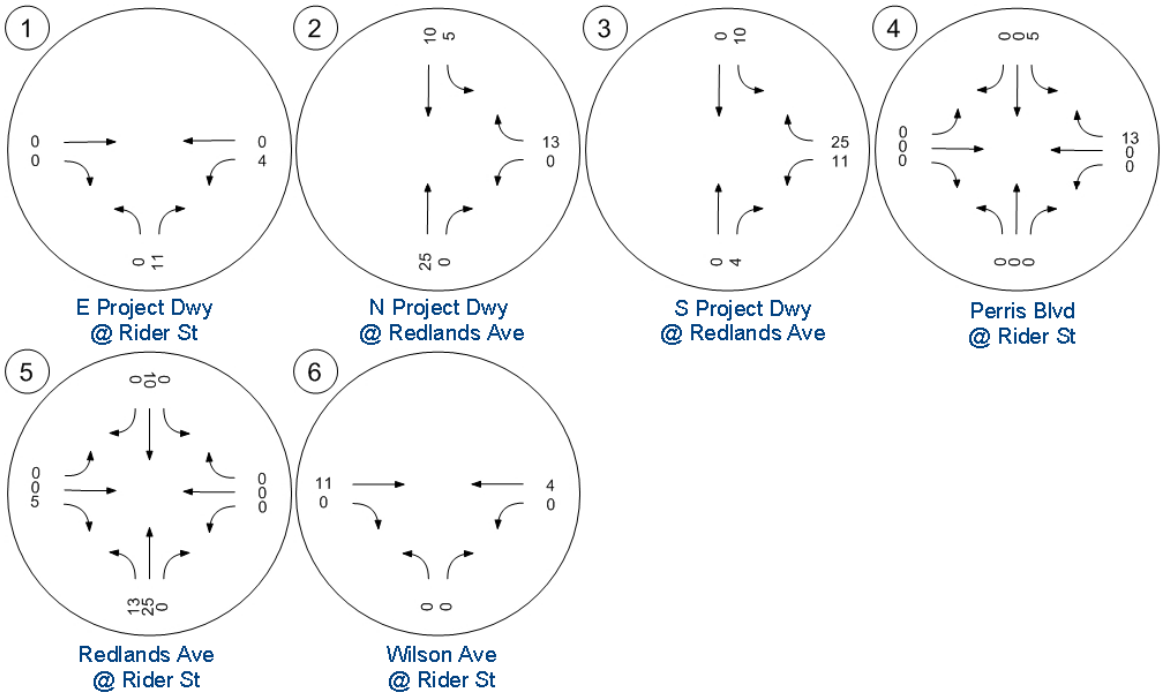


Figure 6: Project Traffic Volumes (PCE) – PM Peak Hour



IV. EXISTING CONDITIONS (2020)

The proposed project site is located in Riverside County, in northern Perris, east of the I-215 freeway. The site lies on the southeast corner of the intersection of Rider Street and Redlands Avenue.

Existing Roadway Network

Classified as a Secondary Arterial in the City of Perris General Plan, **Rider Street** is a four-lane roadway west of Redlands Avenue and a three-lane roadway east of it.

Redlands Avenue is a two-lane roadway designated as a Secondary Arterial in the City's General Plan. Although planned to continue through the northern part of the City, it is currently discontinuous north of Rider Street.

Classified as a Primary Arterial, **Perris Boulevard** is a six-lane roadway with a raised median north of Rider Street and a four-lane roadway with a two-way left-turn median lane south of it.

Wilson Avenue is a two-lane undivided roadway classified as a Collector in the City's General Plan. Its northern terminus is at Rider Street.

Figure 7 shows the City of Redlands General Plan roadway system.

Active Transportation Network

Public Transit

Riverside Transit Agency operates buses throughout the Western Riverside County, including five fixed-route bus lines within and through the City of Perris. Within the study area, Route 19 travels along Perris Boulevard, connecting northward to the Moreno Valley, and Route 41 travels along Rider Street and Perris Boulevard, connecting to Mead Valley.

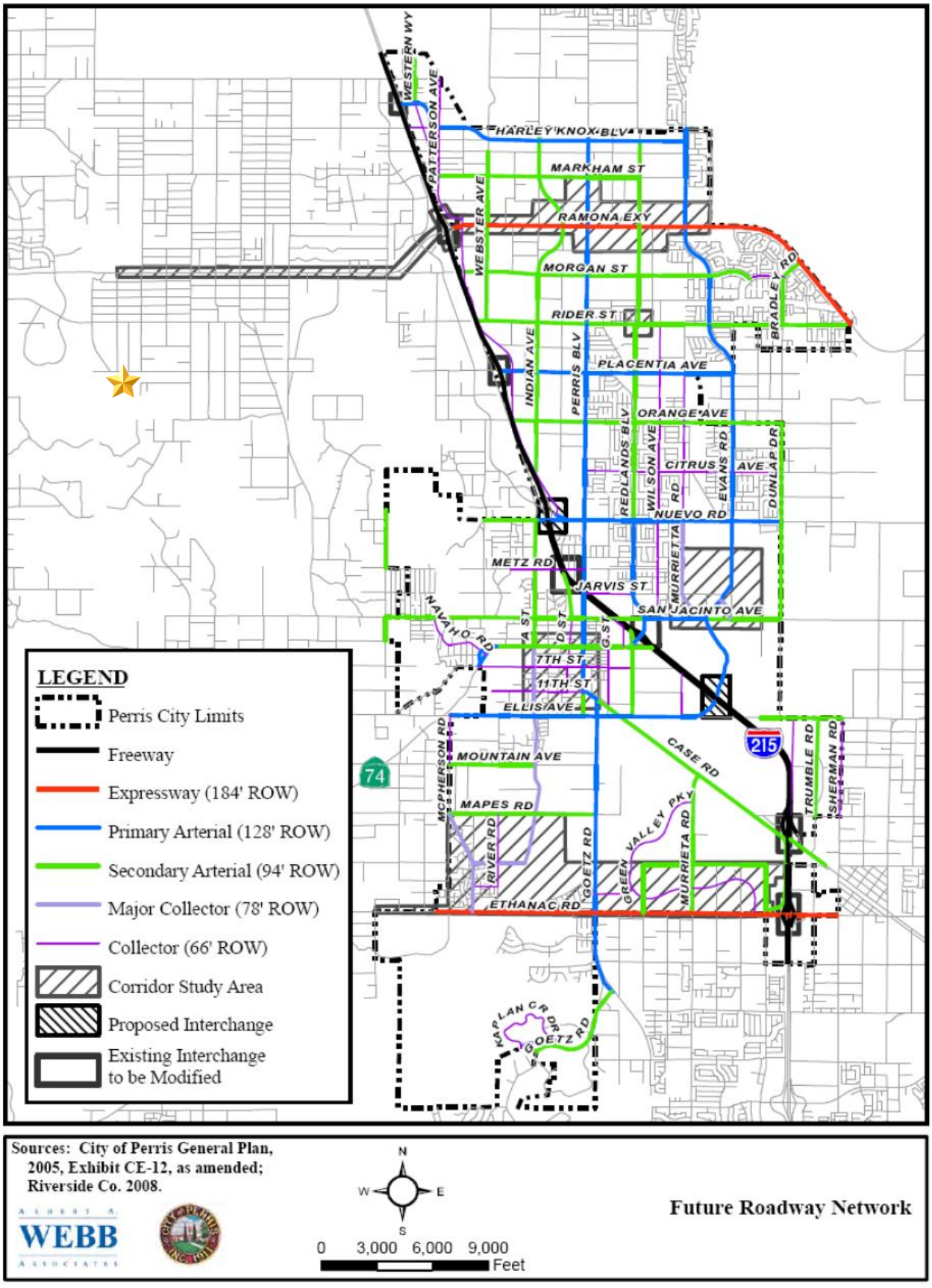
Commuter Rail

The Riverside Line, a commuter rail line operated by Metrolink, connects the City of Perris to the City of Los Angeles at LA Union Station, with connections available to the San Fernando Valley as well as Ventura, Orange, and San Bernardino Counties. It operates only during the morning and evening peak periods.

Pedestrian Facilities

Pedestrian facilities within the study area generally exist only where developments have made frontage improvements. The project proposes to construct partial-width improvements along its frontage, including sidewalks.

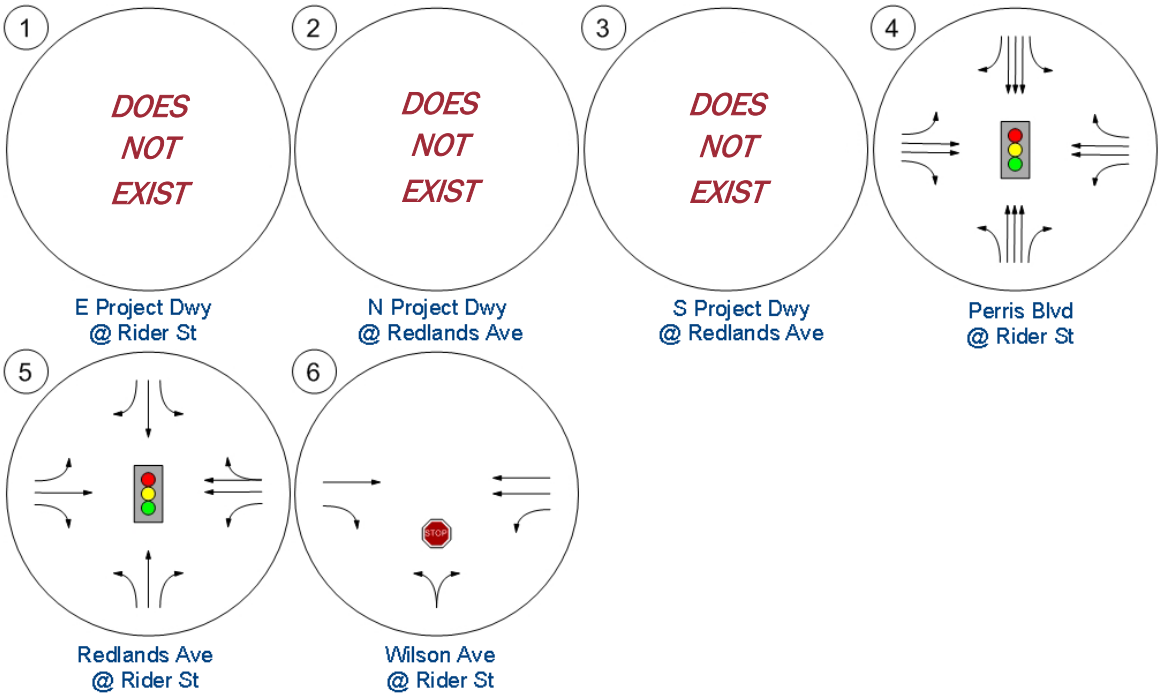
Figure 7: City of Perris Circulation Plan



Existing Intersection Geometrics and Traffic Control

Figure 8 identifies the existing intersection traffic controls, intersection geometrics, and the number of vehicle lanes for each study intersection.

Figure 8: Existing Intersection Geometrics and Traffic Control



Existing Traffic Volumes

To establish a baseline analysis for existing conditions, intersection turning movement counts were conducted at the existing study intersections on Thursday, May 30, 2019 for the AM and PM peak periods (**Appendix C**). Redlands Avenue to the north of Rider Street is a newly constructed roadway that was not included in the original counts due to construction. The level of existing and recent developments on Redlands Avenue is relatively low and eventually ends less than two miles to the north at Harley Knox Boulevard. For a conservative analysis, this study assumes that 90 vehicles would travel southbound and another 70 vehicles would travel northbound at the intersection of Redlands Avenue at Rider Street during the peak hours. The AM and PM peak-hour traffic volumes are shown on **Figures 9 and 10**, respectively.

Figure 9: Existing Traffic Volumes – AM Peak Hour

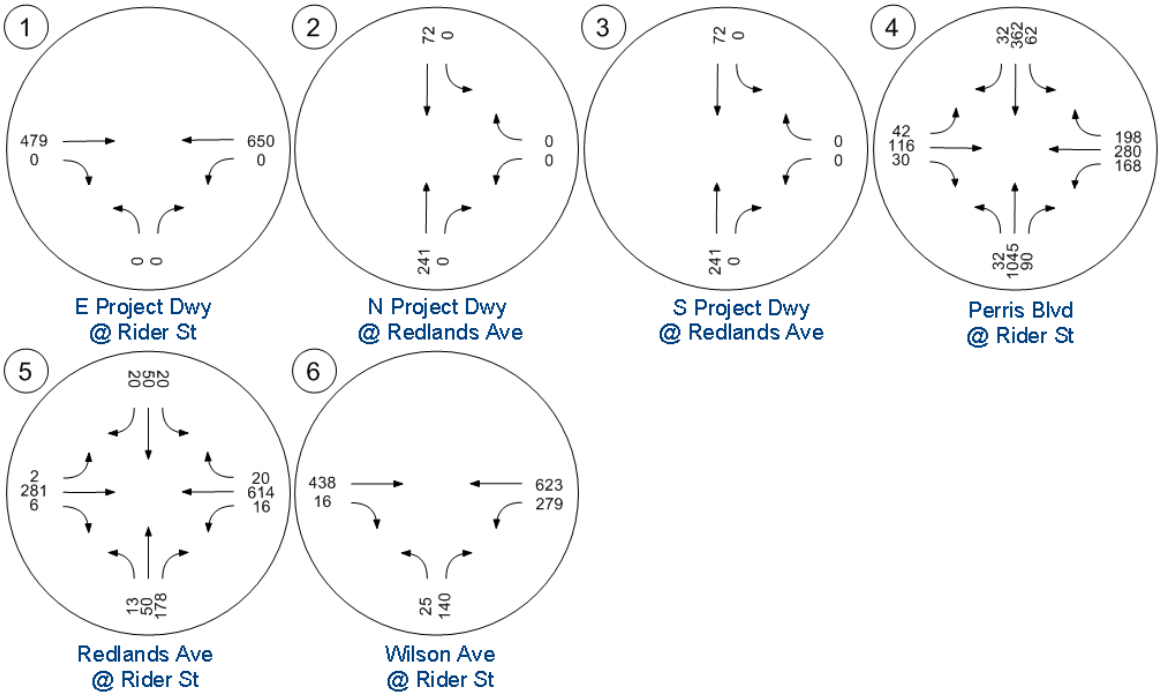
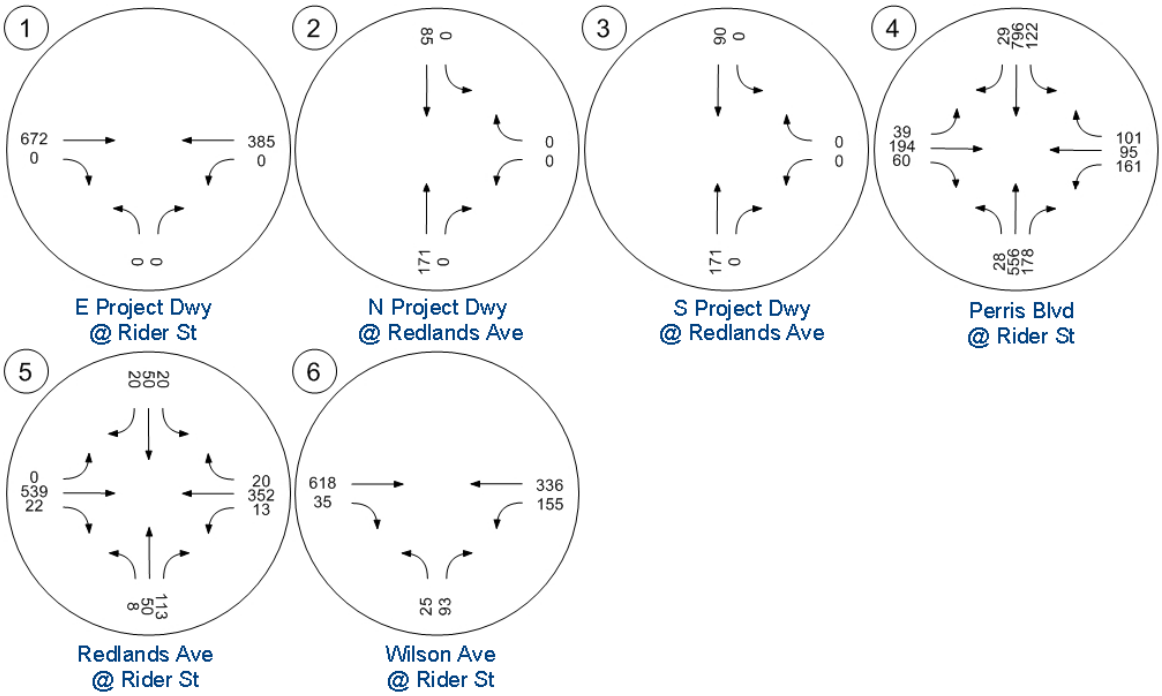


Figure 10: Existing Traffic Volumes – PM Peak Hour



Levels of Service – Existing Conditions (2020)

Based on the existing intersection geometrics and peak-hour traffic volumes, intersection LOS was analyzed for the AM and PM peak hours (**Table 5**, see **Appendix D** for details). Under existing conditions, the following study intersection currently operates below the minimum acceptable LOS standard:

- Rider St @ Wilson Ave

Table 5: Intersection LOS – Existing Conditions (2020)

	Intersection	Traffic Control[1]	AM Peak Hr Delay	AM Peak Hr LOS[2]	PM Peak Hr Delay	PM Peak Hr LOS[2]
1	East Project Dwy @ Rider St	*DOES NOT EXIST*				
2	North Project Dwy @ Redlands Ave	*DOES NOT EXIST*				
3	South Project Dwy @ Redlands Ave	*DOES NOT EXIST*				
4	Rider St @ Perris Blvd	Signal	16.2	**B**	14.8	**B**
5	Rider St @ Redlands Ave	Signal	13.4	**B**	12.8	**B**
6	Rider St @ Wilson Ave	TWSC	113	**F**	45.6	**E**

[1] TWSC = two-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.
X = LOS falls below minimum threshold

Levels of Service – Existing Conditions plus Project Traffic

The expected project traffic is then added to the existing AM and PM peak-hour traffic volumes (**Figures 11 and 12**, respectively). **Table 6** gives the LOS analysis results for the "existing plus project" scenario, with detailed worksheets in **Appendix D**. With the addition of the proposed project traffic, the following study intersection is expected to continue operating below the minimum acceptable LOS standard:

- Rider St @ Wilson Ave

Figure 11: Existing plus Project Traffic Volumes – AM Peak Hour

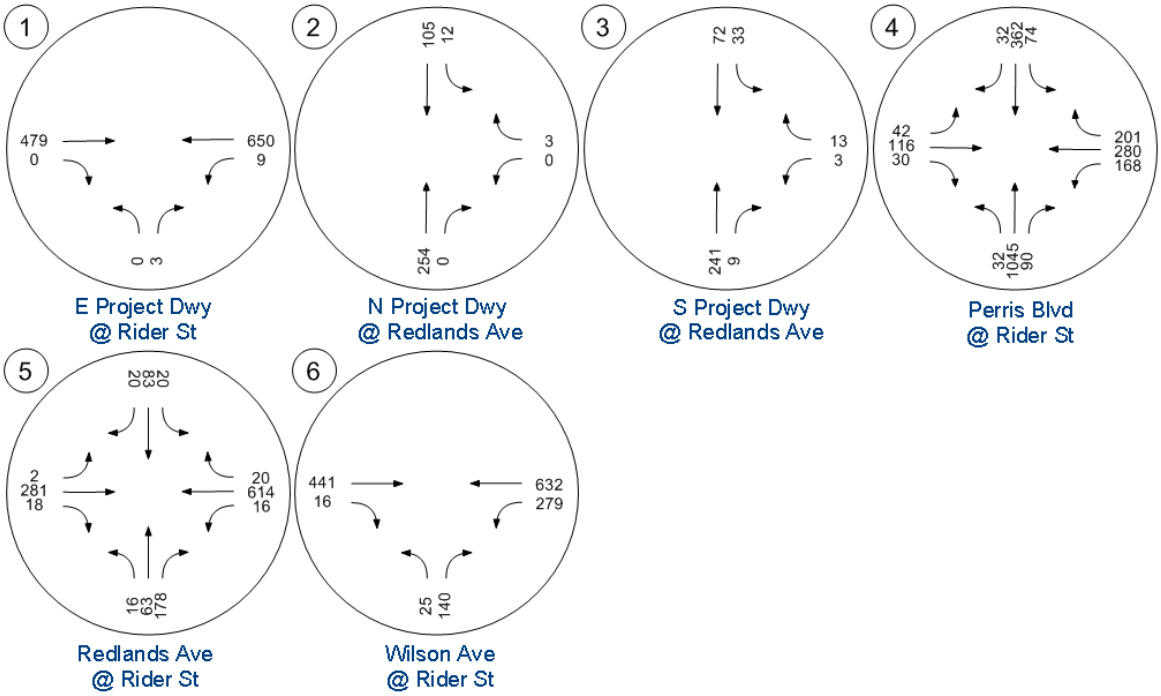


Figure 12: Existing plus Project Traffic Volumes – PM Peak Hour

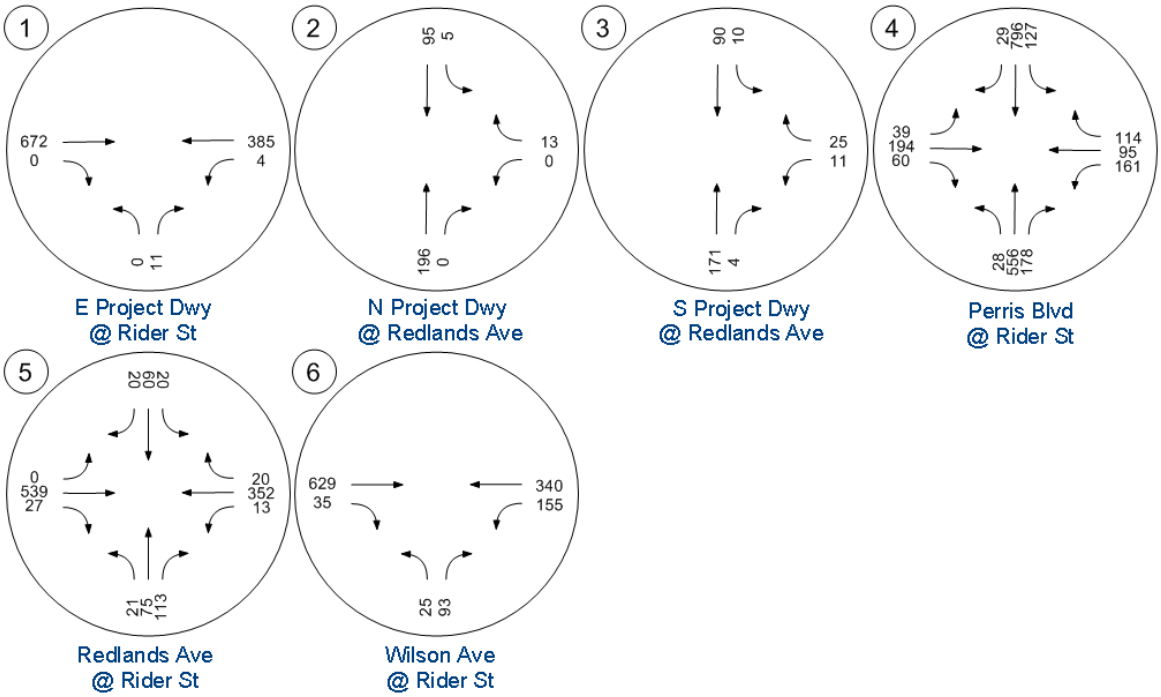


Table 6: Intersection LOS – Existing Conditions plus Project Traffic

	Intersection	Traffic Control[1]	AM Peak Hr Delay	AM Peak Hr LOS[2]	PM Peak Hr Delay	PM Peak Hr LOS[2]
1	East Project Dwy @ Rider St	TWSC	11.7	**B**	13.8	**B**
2	North Project Dwy @ Redlands Ave	TWSC	9.8	**A**	9.4	**A**
3	South Project Dwy @ Redlands Ave	TWSC	11.5	**B**	10.5	**B**
4	Rider St @ Perris Blvd	Signal	16.6	**B**	14.9	**B**
5	Rider St @ Redlands Ave	Signal	13.4	**B**	13.1	**B**
6	Rider St @ Wilson Ave	TWSC	116.6	**F**	47.0	**E**

[1] TWSC = two-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.
X = LOS falls below minimum threshold

Recommended Improvements – Existing plus Project

With the addition of estimated project traffic, the unsignalized intersection of Rider Street at and Wilson Avenue is expected to operate at LOS F in the AM peak hour and at LOS E in the PM peak hour. At this location, it is recommended to install a new traffic signal. No other project-related offsite recommendations are anticipated, even with adjustments to driveway configurations or trip distribution as all other study intersections are expected to operate well above the minimum acceptable LOS standard.

With the implementation of the recommended improvements, all study intersections are expected to operate at or above the minimum acceptable LOS standard (**Table 7**, see **Appendix D** for details).

Table 7: Intersection LOS – Existing plus Project with Improvements

	Intersection	Traffic Control[1]	AM Peak Hr Delay	AM Peak Hr LOS[2]	PM Peak Hr Delay	PM Peak Hr LOS[2]
1	East Project Dwy @ Rider St	TWSC	11.7	**B**	13.8	**B**
2	North Project Dwy @ Redlands Ave	TWSC	9.8	**A**	9.4	**A**
3	South Project Dwy @ Redlands Ave	TWSC	11.5	**B**	10.5	**B**
4	Rider St @ Perris Blvd	Signal	16.6	**B**	14.9	**B**
5	Rider St @ Redlands Ave	Signal	13.4	**B**	13.1	**B**
6	**Rider St @ Wilson Ave**	**Signal**	**12.0**	**B**	**11.1**	**B**

[1] TWSC = two-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.

V. PROJECT OPENING DAY CONDITIONS (2022)

Ambient Area Growth

An ambient traffic growth factor is used in future traffic models to account for regular growth in traffic volumes due to the developments within the region. Per the approved scoping agreement (Appendix A), this study uses a 3 percent annual ambient growth rate, for a total ambient growth of 9% from 2019 to 2022.

Related Projects Analysis

Related projects are developments within the surrounding area of the proposed project that are anticipated to be completed and contribute vehicle trips to the roadway network by the project's opening year (2022). Compiled from a list provided by the City of Perris, the related projects used in this study are given in **Table 8**, with their AM and PM peak-hour traffic volumes in **Figures 13 and 14**, respectively

Table 8: Related Projects within the Study Area

Project		Land Use		Size		Trip Generation		
				Qty	Unit	AM	PM	Daily
1	Cali Express Carwash	***948***	*Automated Car Wash*	5.6	KSF	0	80	800
2	Duke / Perris	***154***	*High-Cube Warehousing*	1070	KSF	86	107	1,498
3	First Perry	***154***	*High-Cube Warehousing*	240.0	KSF	19	24	336
4	Duke / Perry	***150***	*Warehousing*	144	KSF	24	27	251
5	IDI	***154***	*High-Cube Warehousing*	246	KSF	34	43	596
6	Rider 1	***154***	*High-Cube Warehousing*	350	KSF	28	35	490
7	Rider 3	***154***	*High-Cube Warehousing*	640	KSF	51	64	896
8	Burge Industrial 1	***140***	*Manufacturing*	18	KSF	11	12	71
9	Burge Industrial 2	***140***	*Manufacturing*	19	KSF	12	13	75
10	Rider 2 & 4	***154***	*High-Cube Warehousing*	1373	KSF	110	137	1,922
11	First Industrial Wilson	***150***	*Warehousing*	320	KSF	77	77	790
12	Weinerschnitzel	***934***	*Fast-Food w. Drive-Thru*	2	KSF	80	65	942
13	TR32497	***210***	*Single-Family Housing*	131	DU	97	130	1,237
14	TR37014	***220***	*Multi-family Housing*	202	DU	93	113	1,479
15	TR34260	***210***	*Single-Family Housing*	22	DU	16	22	208
16	TR36797	***210***	*Single-Family Housing*	76	DU	56	75	717
17	TR33977	***210***	*Single-Family Housing*	340	DU	252	337	3,210
18	TR33978	***210***	*Single-Family Housing*	139	DU	103	138	1,312
19	TR33976	***220***	*Multi-family Housing*	207.00	DU	95	116	1,515
			Total Related Projects Trips			**1,244**	**1,615**	**18,345**

Figure 13: Related Projects Traffic Volumes – AM Peak Hour

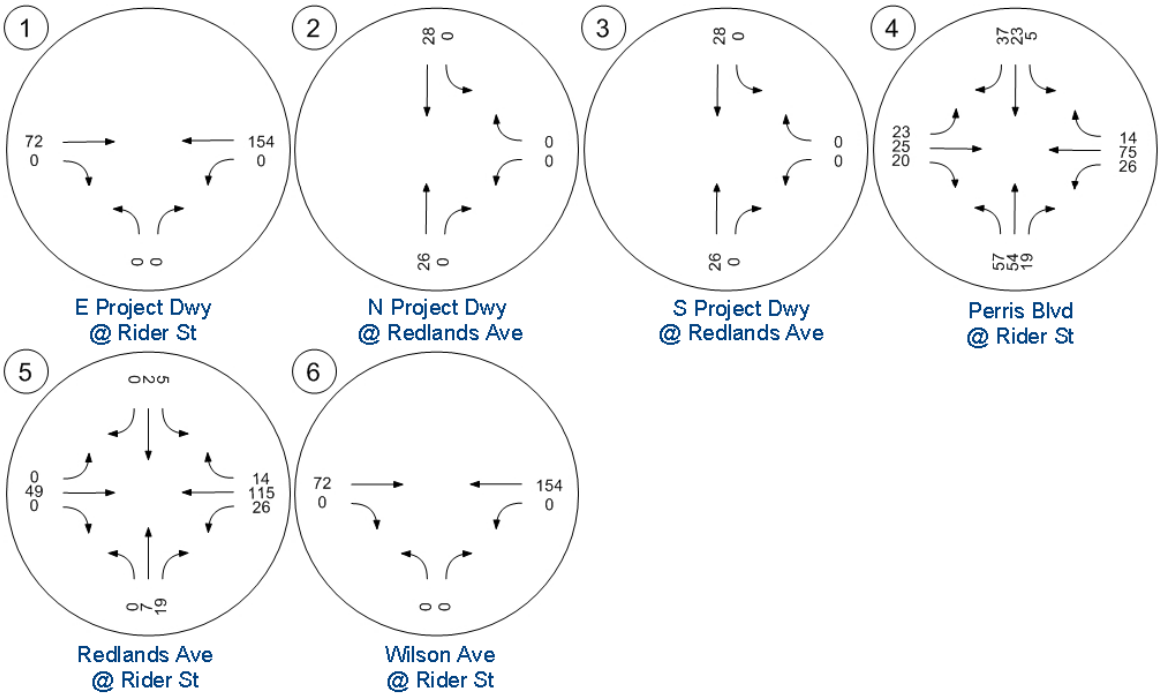
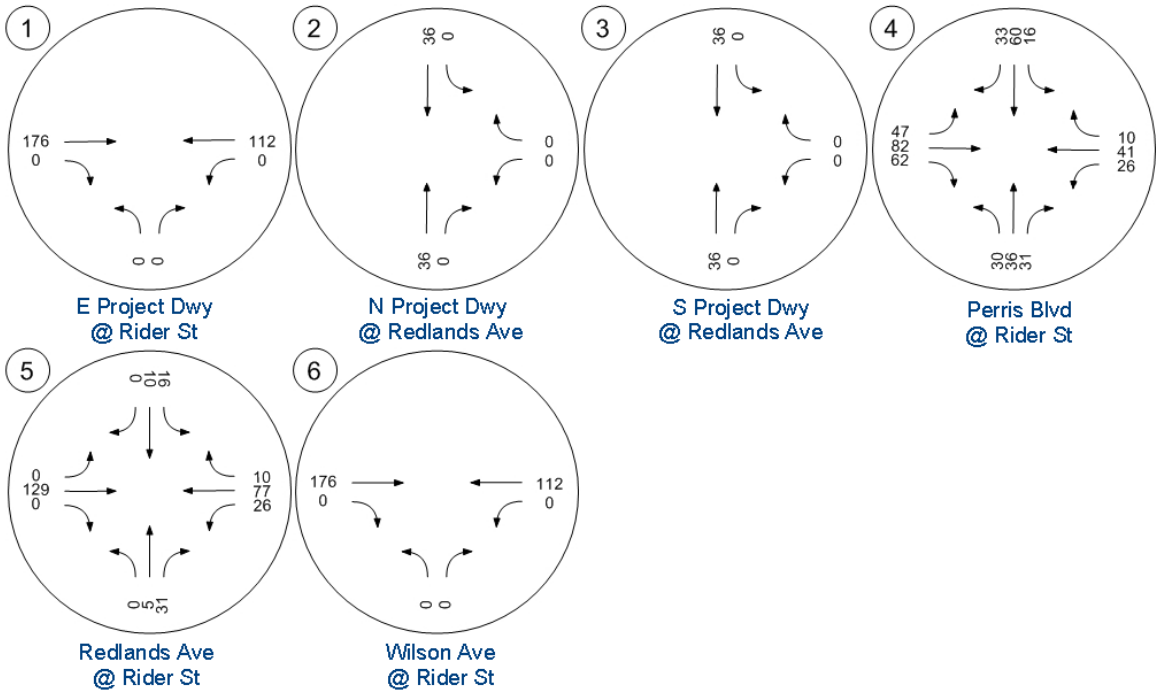


Figure 14: Related Projects Traffic Volumes – PM Peak Hour



Levels of Service – Opening Day Conditions

The ambient growth and related projects traffic are added to the existing traffic volumes to estimate opening day traffic conditions. The AM and PM peak-hour traffic volumes for the "opening day" scenario are shown on **Figures 15 and 16**, respectively.

Figure 15: Opening Day Traffic Volumes – AM Peak Hour

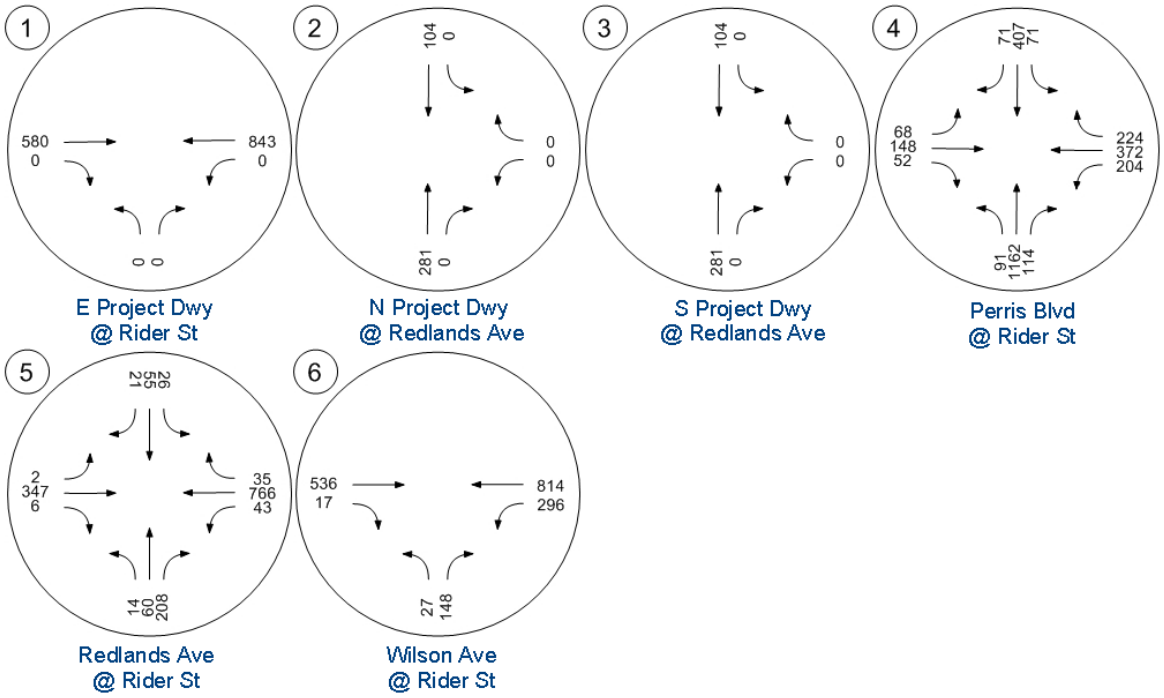


Figure 16: Opening Day Traffic Volumes – PM Peak Hour

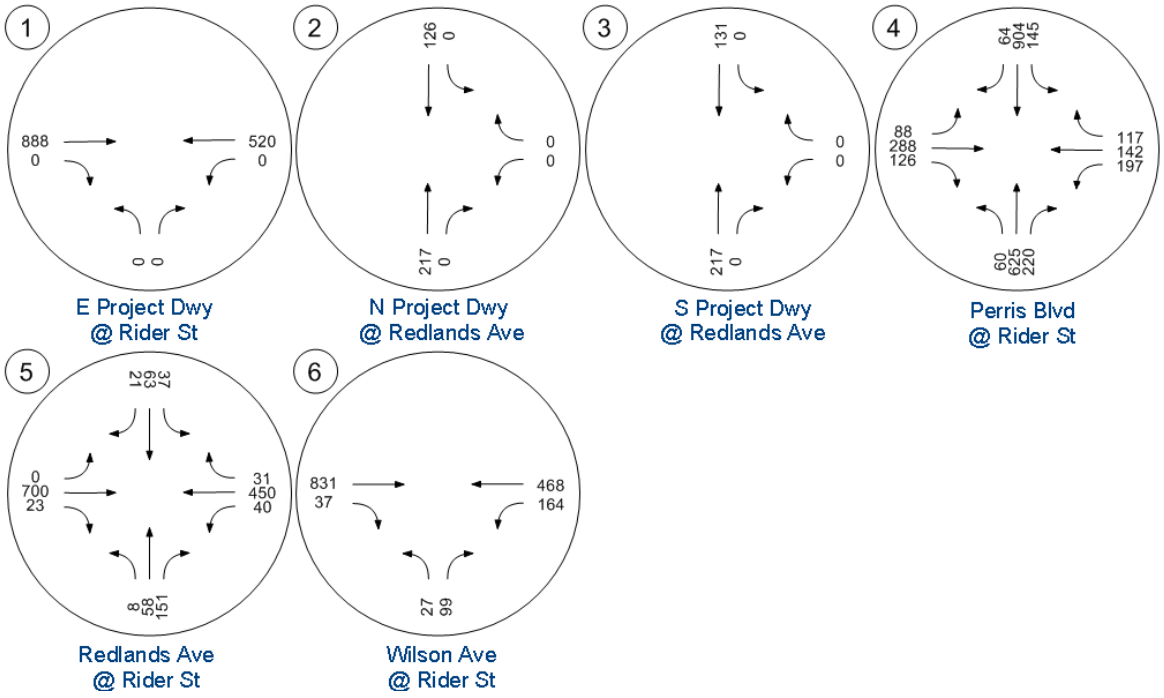


Table 9 summarizes the "opening day" LOS analysis, with detailed worksheets in **Appendix D**. With the addition of ambient traffic growth and related projects, the following intersection is expected to continue operating below the minimum acceptable LOS standard:

- Rider St @ Wilson Ave

Table 9: Intersection LOS – Opening Day Conditions (2022)

	Intersection	Traffic Control[1]	AM Peak Hr Delay	AM Peak Hr LOS[2]	PM Peak Hr Delay	PM Peak Hr LOS[2]
1	East Project Dwy @ Rider St	*DOES NOT EXIST*				
2	North Project Dwy @ Redlands Ave	*DOES NOT EXIST*				
3	South Project Dwy @ Redlands Ave	*DOES NOT EXIST*				
4	Rider St @ Perris Blvd	Signal	19.1	**B**	18.1	**B**
5	Rider St @ Redlands Ave	Signal	15.3	**B**	21.1	**C**
6	Rider St @ Wilson Ave	TWSC	117.6	**F**	116.3	**F**

[1] TWSC = two-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.
X = LOS falls below minimum threshold

Levels of Service – Opening Day Conditions plus Project Traffic

The expected project traffic is then added to the opening day traffic volumes for the AM and PM peak hours (**Figures 17 and 18**, respectively). **Table 10** gives the LOS analysis results for the "opening day plus project" scenario, with detailed worksheets in **Appendix D**. With the addition of the proposed project traffic, the following study intersection is expected to continue operating below the minimum acceptable LOS standard:

- Rider St @ Wilson Ave

Figure 17: Opening Day plus Project Traffic Volumes – AM Peak Hour

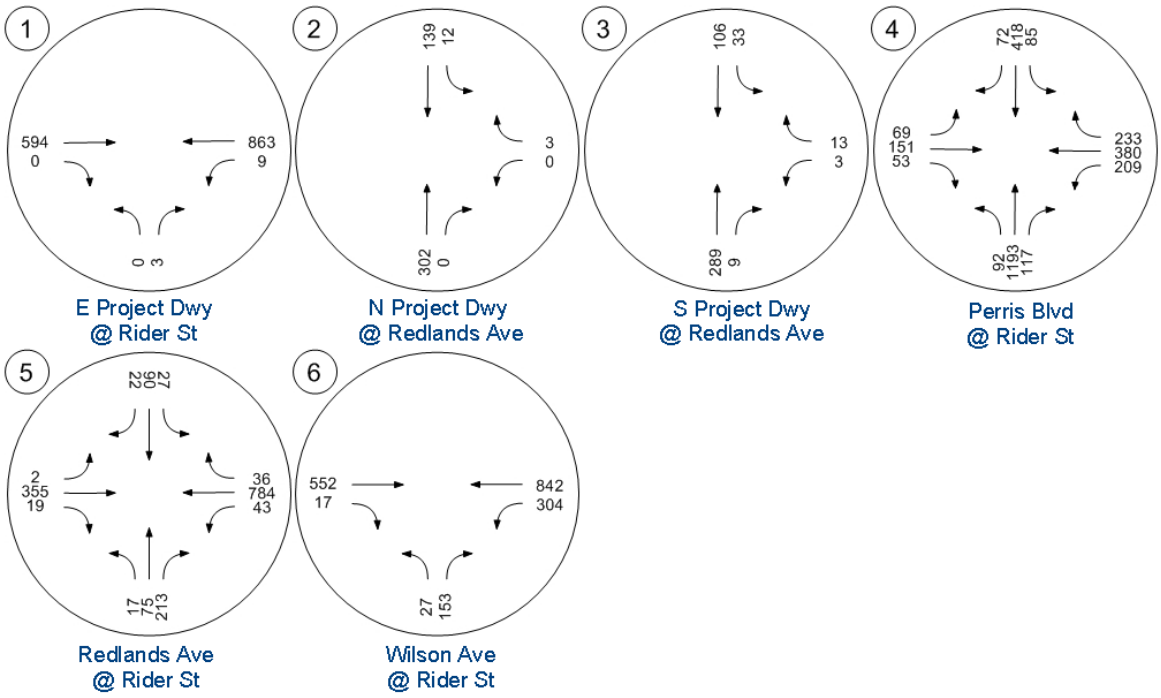


Figure 18: Opening Day plus Project Traffic Volumes – PM Peak Hour

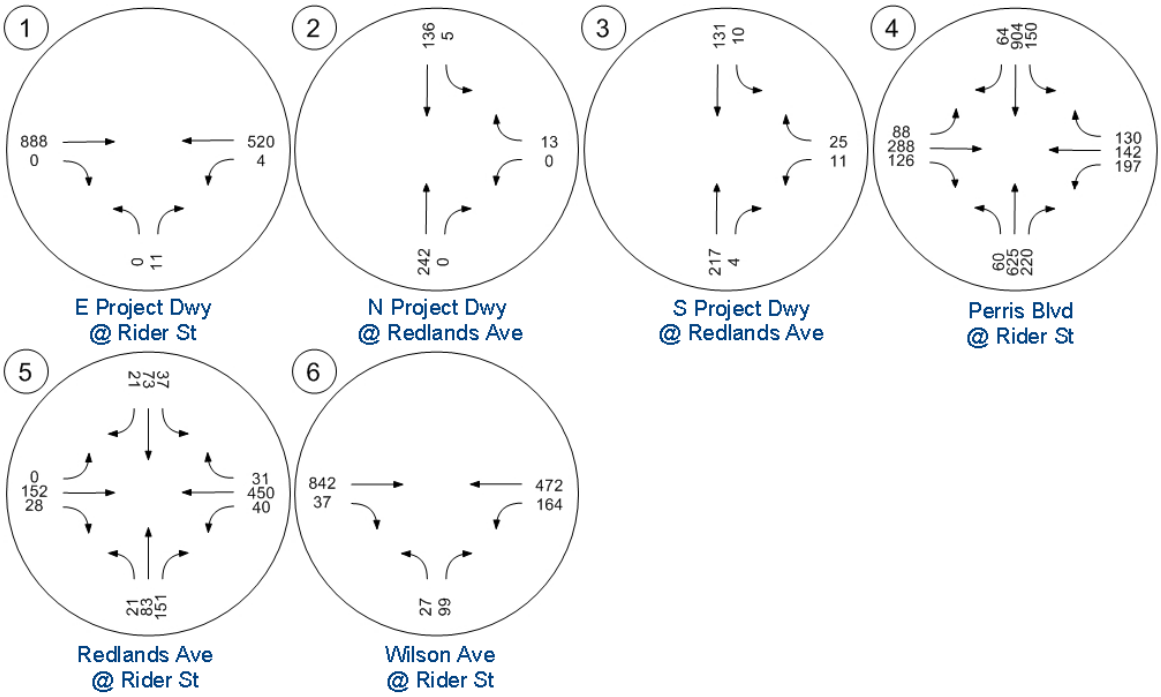


Table 10: Intersection LOS – Opening Day plus Project Traffic (2022)

	Intersection	Traffic Control[1]	AM Peak Hr Delay	AM Peak Hr LOS[2]	PM Peak Hr Delay	PM Peak Hr LOS[2]
1	East Project Dwy @ Rider St	TWSC	12.9	**B**	17	**C**
2	North Project Dwy @ Redlands Ave	TWSC	10.1	**B**	9.7	**A**
3	South Project Dwy @ Redlands Ave	TWSC	12.3	**B**	11.3	**B**
4	Rider St @ Perris Blvd	Signal	20.1	**C**	18.2	**B**
5	Rider St @ Redlands Ave	Signal	14.3	**B**	12.6	**B**
6	Rider St @ Wilson Ave	TWSC	434	**F**	122.3	**F**

[1] TWSC = two-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.
X = LOS falls below minimum threshold

Recommended Improvements

In this scenario, the unsignalized intersection of Rider Street at and Wilson Avenue is expected to operate at LOS F in both the AM and PM peak hours. At this location, it is recommended to install a new traffic signal. No other project-related offsite recommendations are anticipated, even with adjustments to driveway configurations or trip distribution as all other study intersections are expected to operate well above the minimum acceptable LOS standard.

With the implementation of the recommended improvements, all study intersections are expected to operate at or above the minimum acceptable LOS standard (**Table 11**, see **Appendix D** for details).

Table 11: Intersection LOS – Opening Day plus Project with Improvements

	Intersection	Traffic Control[1]	AM Peak Hr Delay	AM Peak Hr LOS[2]	PM Peak Hr Delay	PM Peak Hr LOS[2]
1	East Project Dwy @ Rider St	TWSC	12.9	**B**	17	**C**
2	North Project Dwy @ Redlands Ave	TWSC	10.1	**B**	9.7	**A**
3	South Project Dwy @ Redlands Ave	TWSC	12.3	**B**	11.3	**B**
4	Rider St @ Perris Blvd	Signal	20.1	**C**	18.2	**B**
5	Rider St @ Redlands Ave	Signal	14.3	**B**	12.6	**B**
6	**Rider St @ Wilson Ave**	**Signal**	**13.2**	**B**	**12.7**	**B**

[1] TWSC = two-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.

VI. ALTERNATIVE FUTURE ROADWAY NETWORK

Potential Regional Improvement – Placentia Avenue Interchange

Currently, the I-215 freeway interchanges nearest the project are at Ramona Expressway and Harley Knox Boulevard. Based on the existing City of Perris truck route network and existing traffic restrictions, heavy vehicles headed to and from the project must use the Harley Knox Boulevard interchange. A new freeway interchange is planned to be constructed at Placentia Avenue, which would be closer to the proposed project site than the existing interchanges. Therefore, this study evaluates an alternative future roadway network where project traffic would use the Placentia Avenue interchange after its completion. Accordingly, **Figures 19 and 20** show the alternative network project trip distribution for passenger cars and trucks, respectively, while **Figures 21 and 22** show the project traffic volumes at the study intersections.

Figure 19: Alternative Network Project Trip Distribution – Passenger Cars

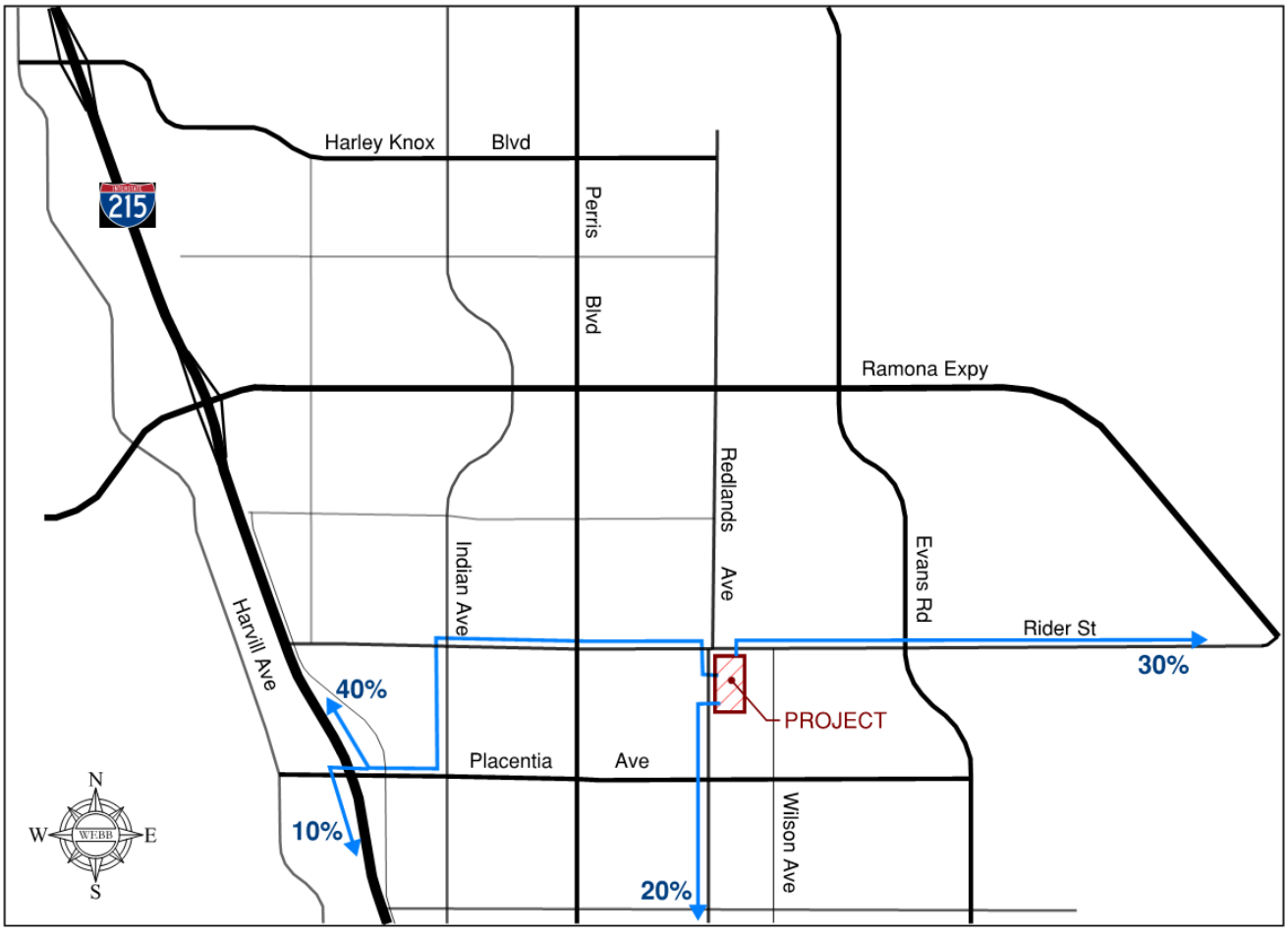


Figure 20: Alternative Network Project Trip Distribution – Trucks

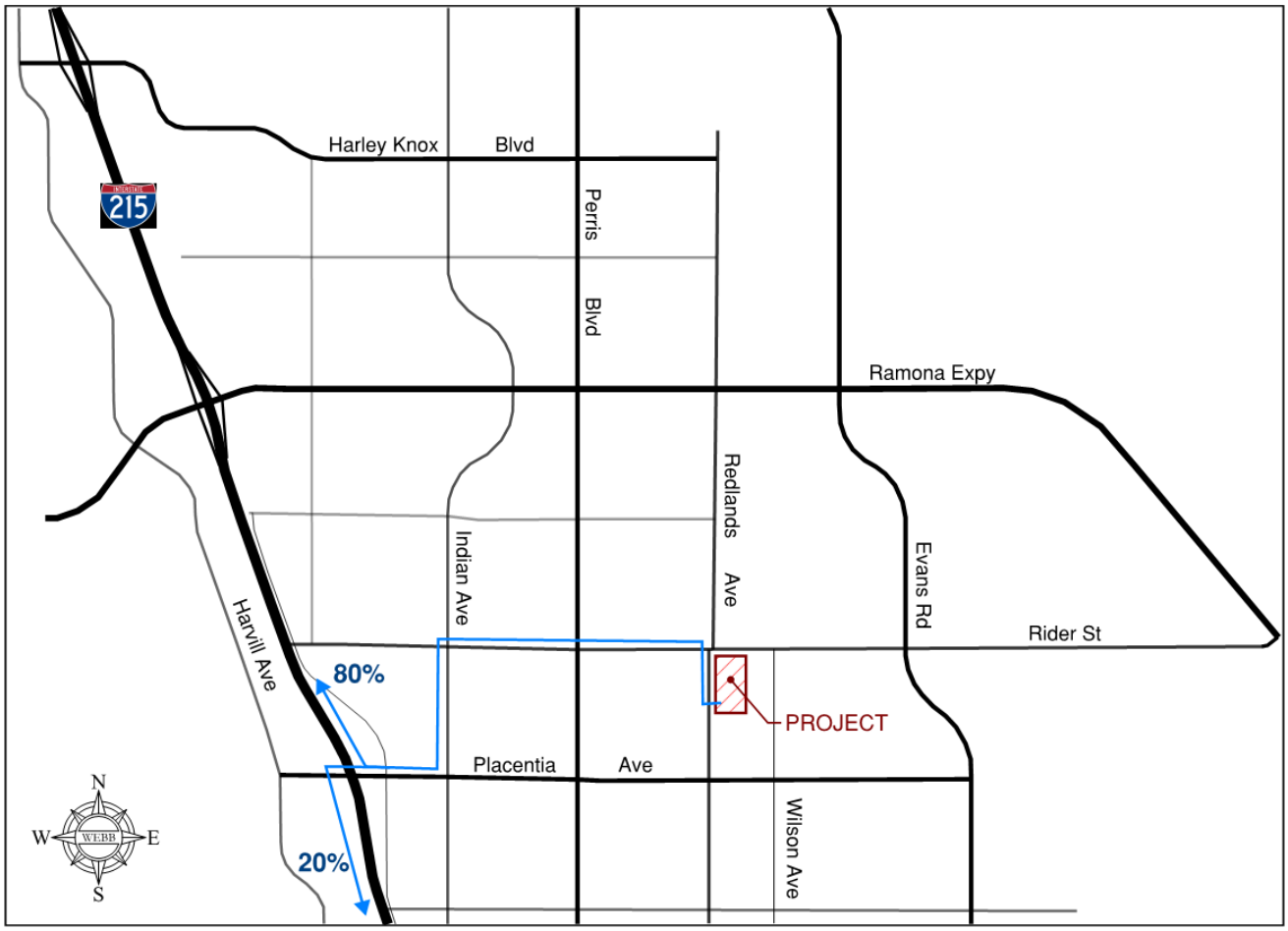


Figure 21: Alternative Network Project Traffic Volumes – AM Peak Hour

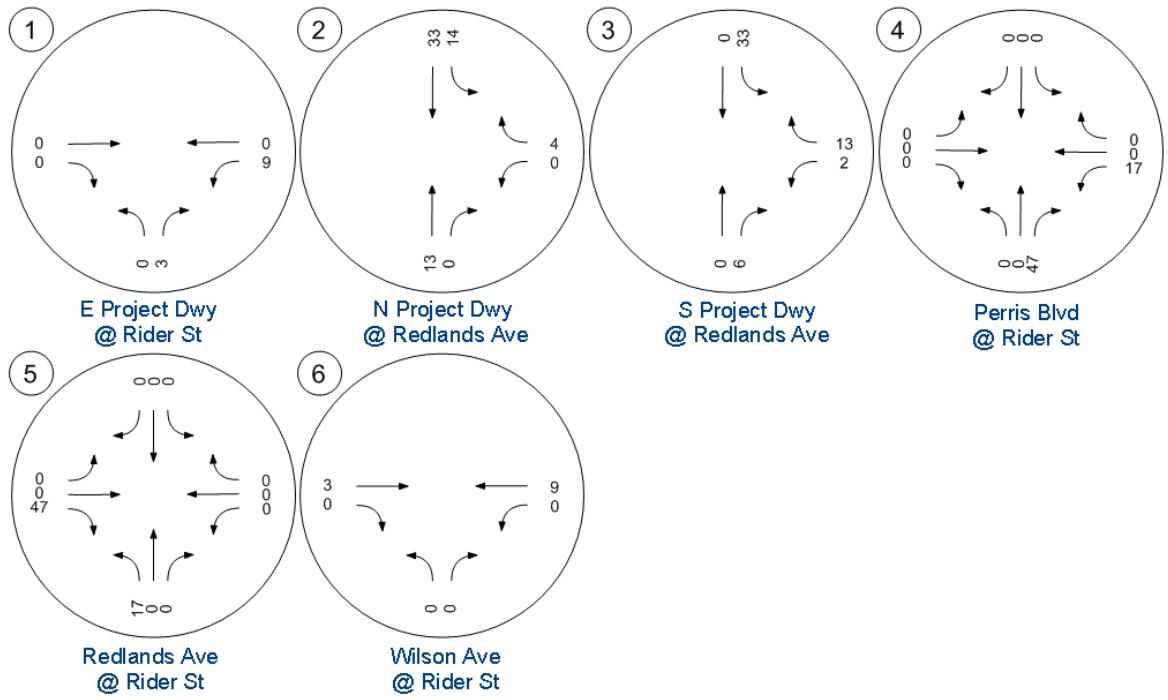
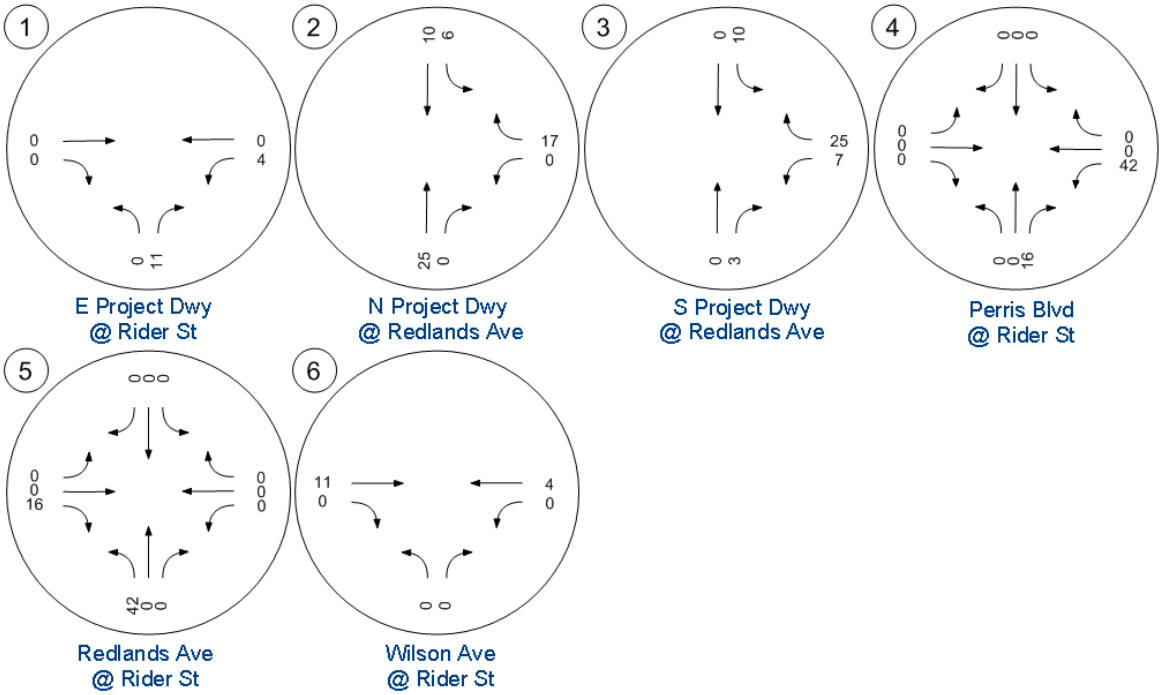


Figure 22: Alternative Network Project Traffic Volumes – PM Peak Hour



Levels of Service – Opening Day plus Project, Alternative Network

The alternative network project traffic is added to the overall alternative AM and PM peak-hour traffic flow volumes (**Figures 23 and 24**, respectively). **Table 12** gives the LOS analysis for the "alternative network opening day plus project" scenario, with detailed worksheets in **Appendix D**. With the addition of the proposed project traffic, the following intersection is expected to continue operating below the minimum acceptable LOS standard:

- Rider St @ Wilson Ave

Figure 23: Alternative Network Opening Day plus Project Traffic Volumes – AM Peak Hour

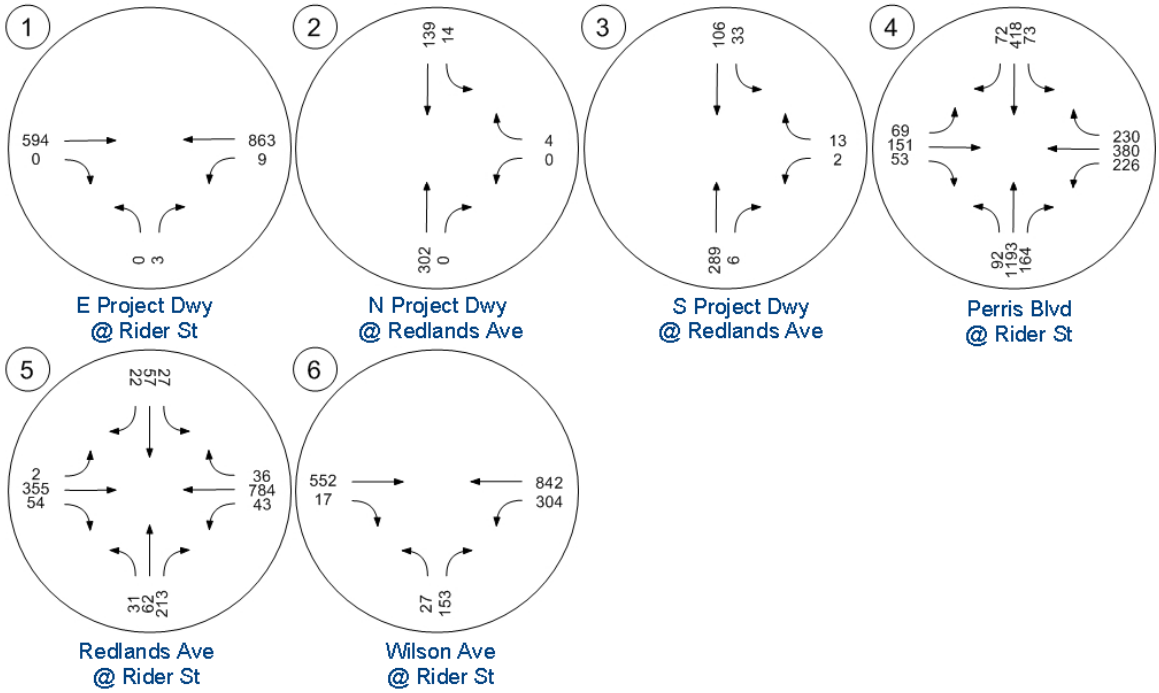


Figure 24: Alternative Network Opening Day plus Project Traffic Volumes – PM Peak Hour

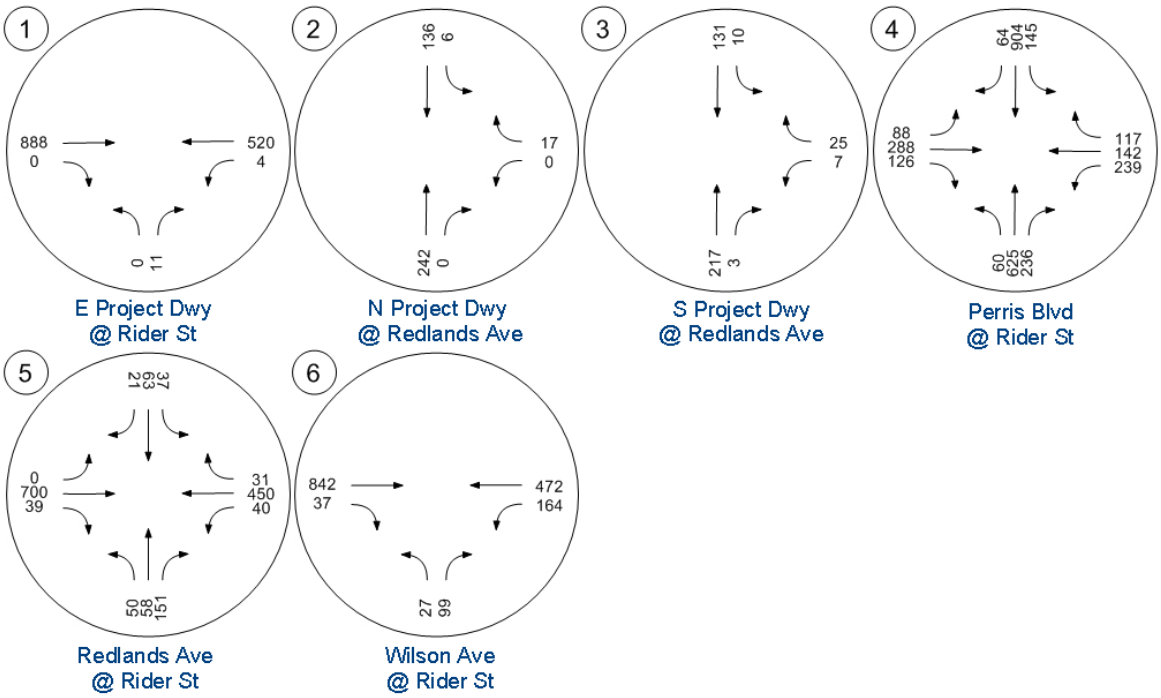


Table 12: Intersection LOS – Alternative Network Opening Day plus Project Traffic

	Intersection	Traffic Control[1]	AM Peak Hr		PM Peak Hr	
			Delay	LOS[2]	Delay	LOS[2]
1	East Project Dwy @ Rider St	TWSC	12.9	**B**	17	**C**
2	North Project Dwy @ Redlands Ave	TWSC	10.1	**B**	9.7	**A**
3	South Project Dwy @ Redlands Ave	TWSC	12.3	**B**	11.2	**B**
4	Rider St @ Perris Blvd	Signal	19.6	**B**	19.5	**B**
5	Rider St @ Redlands Ave	Signal	15.5	**B**	21.3	**C**
6	Rider St @ Wilson Ave	TWSC	434	**F**	122.3	**F**

[1] TWSC = two-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.
X = LOS falls below minimum threshold

Recommended Improvements – Opening Day plus Project, Alternative Network

In this scenario, the unsignalized intersection of Rider Street at and Wilson Avenue is expected to operate at LOS F in both the AM and PM peak hours. At this location, it is recommended to install a new traffic signal. No other project-related offsite recommendations are anticipated, even with adjustments to driveway configurations or trip distribution as all other study intersections are expected to operate well above the minimum acceptable LOS standard.

With the implementation of the recommended improvements, all study intersections are expected to operate at or above the minimum acceptable LOS standard (**Table 13**, see **Appendix D** for details).

Table 13: Intersection LOS – Alternative Network Opening Day plus Project with Improvements

	Intersection	Traffic Control[1]	AM Peak Hr		PM Peak Hr	
			Delay	LOS[2]	Delay	LOS[2]
1	East Project Dwy @ Rider St	TWSC	12.9	**B**	17	**C**
2	North Project Dwy @ Redlands Ave	TWSC	10.1	**B**	9.7	**A**
3	South Project Dwy @ Redlands Ave	TWSC	12.3	**B**	11.2	**B**
4	Rider St @ Perris Blvd	Signal	19.6	**B**	19.5	**B**
5	Rider St @ Redlands Ave	Signal	15.5	**B**	21.3	**C**
6	**Rider St @ Wilson Ave**	**Signal**	**13.2**	**B**	**11.9**	**B**

[1] TWSC = two-way stop control
[2] Level of service (LOS) rankings based on average control delay (sec/veh) per Highway Control Manual.

VII. OTHER PROJECT CONSIDERATIONS

Traffic Signal Warrants

The California Manual on Uniform Control Devices (MUTCD) provides a set of nine warrant guidelines for the installation of a traffic signal. These traffic signal warrants include volume thresholds as well as other considerations such as proximity to railroad grade crossings or existing traffic signals.

The unsignalized study intersection of Rider Street and Wilson Avenue currently operates below the minimum LOS standard for the City of Perris. Accordingly, as a preliminary step in assessing the need for and feasibility of a new traffic signal, this study found that this intersection currently meets the peak-hour traffic signal warrant as outlined in the MUTCD (see **Appendix F** for worksheets). Likewise, it is expected that this intersection would meet the peak-hour traffic signal warrant under project opening day and future buildout conditions as well.

Per the MUTCD guidelines, the satisfaction of any single warrant shall not require the installation of a traffic signal. The peak-hour traffic signal warrant analysis should only be considered an indicator that an unsignalized intersection is likely to meet one or more of the other volume-based signal warrants. The MUTCD further advises that an engineering study should be conducted to determine that installing a traffic control signal will improve the overall safety and/or operation of the intersection and not seriously disrupt progressive traffic flow.

A full assessment of the traffic signal warrants—including traffic volumes, collision history, and other factors—should be conducted prior to installing a new traffic signal.

Regional Funding Mechanisms – Project Fair Share Contributions

Per the City of Perris General Plan, the project will participate in the cost of off-site improvements such as the potential traffic signal installation through the payment of "fair share" mitigation fees. Although the intersection of Rider Street currently operates below the minimum LOS standard under existing conditions, the project is anticipated to add some traffic to the existing traffic flows at this location. Therefore, since the project traffic contributes to the deficient operations, the project would contribute to the cost of mitigations proportionally. Accordingly, **Table 14** provides the calculated project "fair share" contributions for off-site improvement projects.

Table 14: Project Fair Share Contribution

Intersection		AM Peak Hour				PM Peak Hour				Project Fair Share
		Existing Traffic	Future Traffic	Project Traffic	Fair Share	Existing Traffic	Future Traffic	Project Traffic	Fair Share	
6	Rider St @ Wilson Ave	1,539	1,895	12	3.4%	1,281	1,641	15	4.2%	**4.2%**

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APPENDIX C – LEVEL OF SERVICE CALCULATIONS

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Existing AM_LOS.pdf

Scenario 1 Existing AM
1/3/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Redlands Ave/Rider St	Signalized	HCM 6th Edition	EB Left	0.377	13.8	B
2	Wilson Ave/Rider St	Two-way stop	HCM 6th Edition	NB Left	0.494	88.3	F
3	Project Dwy/Rider St	Two-way stop	HCM 6th Edition	WB Thru	0.007	0.0	A
4	Wilson Ave/North Project Dwy	Two-way stop	HCM 6th Edition	SB Thru	0.003	0.0	A
5	Wilson Ave/South Project Dwy	Two-way stop	HCM 6th Edition	SB Thru	0.003	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Redlands Ave/Rider St

Control Type:	Signalized	Delay (sec / veh):	13.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.377

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	52	183	21	52	21	2	289	6	16	632	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	52	183	21	52	21	2	289	6	16	632	21
Peak Hour Factor	0.848	0.848	0.848	0.950	0.950	0.950	0.835	0.835	0.835	0.927	0.927	0.927
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	4	15	54	6	14	6	1	87	2	4	170	6
Total Analysis Volume [veh/h]	15	61	216	22	55	22	2	346	7	17	682	23
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	4	0	7	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	20	0	11	20	0	61	78	0	11	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	34	34	34	34	34	34	34	34	34	34	34	34
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	7	7	1	7	7	0	9	9	1	10	10
g / C, Green / Cycle	0.03	0.21	0.21	0.04	0.19	0.19	0.00	0.27	0.27	0.03	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.01	0.04	0.15	0.01	0.03	0.02	0.00	0.21	0.00	0.01	0.21	0.21
s, saturation flow rate [veh/h]	1603	1683	1431	1603	1683	1431	1603	1683	1431	1603	1683	1664
c, Capacity [veh/h]	45	349	297	64	330	280	7	454	386	50	500	494
d1, Uniform Delay [s]	16.46	11.25	12.77	16.14	11.54	11.33	17.14	11.59	9.26	16.37	10.81	10.81
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.28	0.24	3.40	3.20	0.24	0.12	24.41	2.69	0.02	3.88	1.87	1.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.17	0.73	0.35	0.17	0.08	0.31	0.76	0.02	0.34	0.71	0.71
d, Delay for Lane Group [s/veh]	20.74	11.48	16.17	19.33	11.77	11.45	41.55	14.29	9.27	20.24	12.68	12.71
Lane Group LOS	C	B	B	B	B	B	D	B	A	C	B	B
Critical Lane Group	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.15	0.32	1.47	0.20	0.29	0.12	0.06	2.12	0.03	0.16	1.98	1.96
50th-Percentile Queue Length [ft/ln]	3.75	7.99	36.83	4.92	7.36	2.91	1.44	53.03	0.77	4.09	49.51	49.08
95th-Percentile Queue Length [veh/ln]	0.27	0.58	2.65	0.35	0.53	0.21	0.10	3.82	0.06	0.29	3.57	3.53
95th-Percentile Queue Length [ft/ln]	6.76	14.38	66.29	8.85	13.25	5.24	2.59	95.45	1.39	7.36	89.13	88.34

Movement, Approach, & Intersection Results

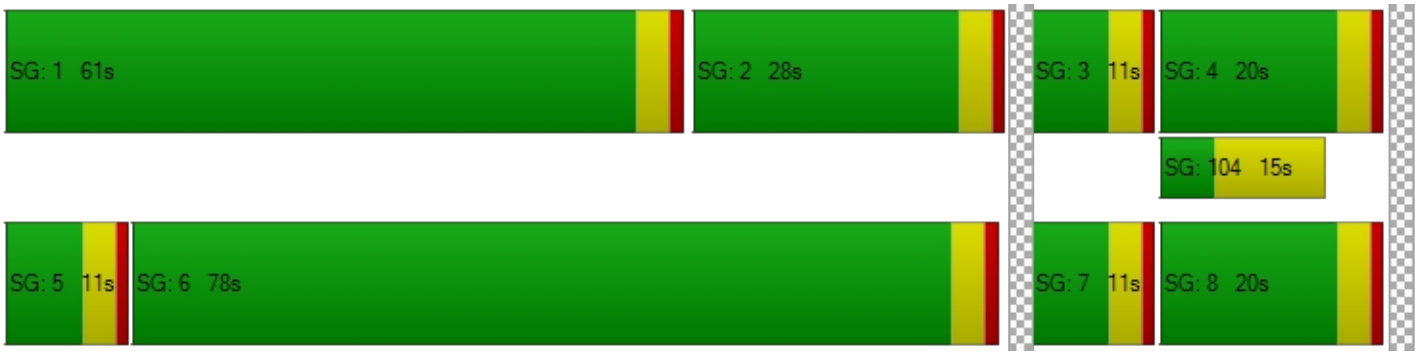
d_M, Delay for Movement [s/veh]	20.74	11.48	16.17	19.33	11.77	11.45	41.55	14.29	9.27	20.24	12.70	12.71
Movement LOS	C	B	B	B	B	B	D	B	A	C	B	B
d_A, Approach Delay [s/veh]	15.42			13.38			14.34			12.87		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	13.77											
Intersection LOS	B											
Intersection V/C	0.377											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	51.34
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	2.465
Crosswalk LOS	F	F	F	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1233	400
d_b, Bicycle Delay [s]	45.07	45.07	8.82	38.40
l_b,int, Bicycle LOS Score for Intersection	2.041	1.723	2.145	2.155
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Wilson Ave/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	88.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.494

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	26	144	451	16	287	642
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	144	451	16	287	642
Peak Hour Factor	0.7930	0.7930	0.8050	0.8050	0.8770	0.8770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	45	140	5	82	183
Total Analysis Volume [veh/h]	33	182	560	20	327	732
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.49	0.25	0.01	0.00	0.33	0.01
d_M, Delay for Movement [s/veh]	88.30	39.46	0.00	0.00	10.42	0.00
Movement LOS	F	E	A	A	B	A
95th-Percentile Queue Length [veh/ln]	5.52	5.52	0.00	0.00	1.45	0.00
95th-Percentile Queue Length [ft/ln]	138.07	138.07	0.00	0.00	36.35	0.00
d_A, Approach Delay [s/veh]	46.96		0.00		3.22	
Approach LOS	E		A		A	
d_I, Intersection Delay [s/veh]	7.28					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 3: Project Dwy/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	493	0	0	670
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	493	0	0	670
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	130	0	0	176
Total Analysis Volume [veh/h]	0	0	519	0	0	705
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	17.41	9.87	0.00	0.00	8.45	0.00
Movement LOS	C	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.64		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Wilson Ave/North Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Wilson Ave					
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave					
Base Volume Input [veh/h]	0	170	304	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	170	304	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	45	80	0	0	0
Total Analysis Volume [veh/h]	0	179	320	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.90	0.00	0.00	0.00	11.78	9.99
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		10.89	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Wilson Ave/South Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Wilson Ave		Wilson Ave			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave		Wilson Ave			
Base Volume Input [veh/h]	0	170	304	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	170	304	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	45	80	0	0	0
Total Analysis Volume [veh/h]	0	179	320	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.90	0.00	0.00	0.00	11.78	9.99
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		10.89	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Existing AM_LOS.pdf

Scenario 1 Existing AM
1/3/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Redlands Ave/Rider St	13	52	183	21	52	21	2	289	6	16	632	21	1308

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
2	Wilson Ave/Rider St	26	144	451	16	287	642	1566

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
3	Project Dwy/Rider St	0	0	493	0	0	670	1163

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
4	Wilson Ave/North Project Dwy	0	170	304	0	0	0	474

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Wilson Ave/South Project Dwy	0	170	304	0	0	0	474

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Existing PM_LOS.pdf

Scenario 2 2 Existing PM
1/3/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Redlands Ave/Rider St	Signalized	HCM 6th Edition	NB Left	0.482	14.0	B
2	Wilson Ave/Rider St	Two-way stop	HCM 6th Edition	NB Left	0.228	41.0	E
3	Project Dwy/Rider St	Two-way stop	HCM 6th Edition	EB Thru	0.007	0.0	A
4	Wilson Ave/North Project Dwy	Two-way stop	HCM 6th Edition	SB Thru	0.002	0.0	A
5	Wilson Ave/South Project Dwy	Two-way stop	HCM 6th Edition	SB Thru	0.002	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Redlands Ave/Rider St

Control Type:	Signalized	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.482

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	8	52	116	21	52	21	23	555	0	13	363	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	52	116	21	52	21	23	555	0	13	363	21
Peak Hour Factor	0.864	0.864	0.864	0.950	0.950	0.950	0.881	0.881	0.881	0.930	0.930	0.930
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	2	15	34	6	14	6	7	157	0	3	98	6
Total Analysis Volume [veh/h]	9	60	134	22	55	22	26	630	0	14	390	23
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	4	0	7	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	20	0	11	20	0	61	78	0	11	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	42	42	42	42	42	42	42	42	42	42	42	42
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	6	6	2	5	5	2	18	18	1	17	17
g / C, Green / Cycle	0.02	0.15	0.15	0.04	0.13	0.13	0.04	0.43	0.43	0.03	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.01	0.04	0.09	0.01	0.03	0.02	0.02	0.37	0.00	0.01	0.12	0.12
s, saturation flow rate [veh/h]	1603	1683	1431	1603	1683	1431	1603	1683	1431	1603	1683	1650
c, Capacity [veh/h]	27	252	214	62	216	184	71	720	612	41	689	675
d1, Uniform Delay [s]	20.48	15.80	16.81	19.76	16.55	16.26	19.56	11.03	0.00	20.18	8.40	8.40
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.86	0.48	2.97	3.46	0.61	0.29	3.11	3.55	0.00	4.80	0.24	0.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.24	0.63	0.36	0.25	0.12	0.37	0.87	0.00	0.34	0.30	0.30
d, Delay for Lane Group [s/veh]	27.34	16.28	19.78	23.21	17.17	16.55	22.67	14.58	0.00	24.98	8.64	8.65
Lane Group LOS	C	B	B	C	B	B	C	B	A	C	A	A
Critical Lane Group	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.13	0.47	1.22	0.25	0.45	0.18	0.28	4.54	0.00	0.17	1.00	0.99
50th-Percentile Queue Length [ft/ln]	3.24	11.79	30.44	6.13	11.28	4.44	7.00	113.5	0.00	4.37	25.02	24.73
95th-Percentile Queue Length [veh/ln]	0.23	0.85	2.19	0.44	0.81	0.32	0.50	8.04	0.00	0.31	1.80	1.78
95th-Percentile Queue Length [ft/ln]	5.84	21.22	54.80	11.04	20.31	7.99	12.60	200.8	0.00	7.86	45.03	44.51

Movement, Approach, & Intersection Results

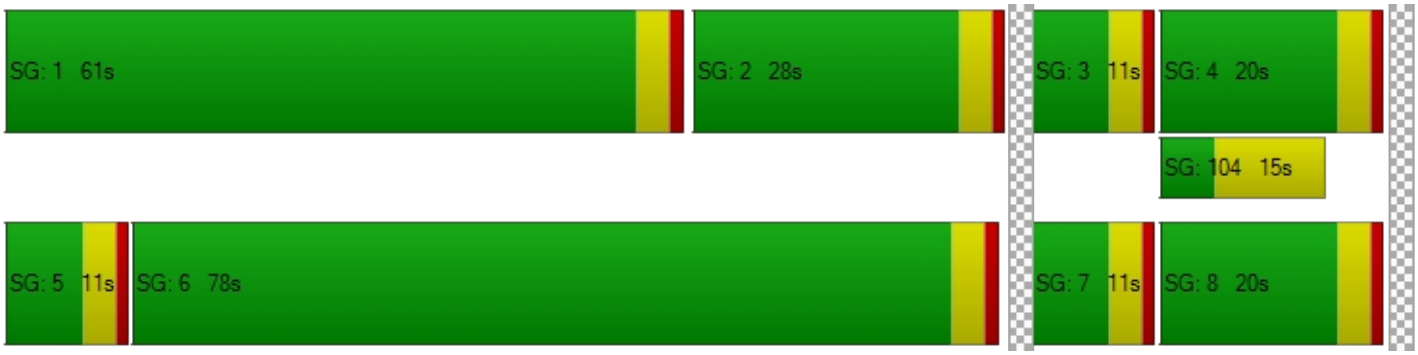
d_M, Delay for Movement [s/veh]	27.34	16.28	19.78	23.21	17.17	16.55	22.67	14.58	0.00	24.98	8.65	8.65
Movement LOS	C	B	B	C	B	B	C	B	A	C	A	A
d_A, Approach Delay [s/veh]	19.08			18.37			14.90			9.18		
Approach LOS	B			B			B			A		
d_I, Intersection Delay [s/veh]	14.00											
Intersection LOS	B											
Intersection V/C	0.482											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	51.34
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	2.442
Crosswalk LOS	F	F	F	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1233	400
d_b, Bicycle Delay [s]	45.07	45.07	8.82	38.40
I_b,int, Bicycle LOS Score for Intersection	1.895	1.723	2.642	1.912
Bicycle LOS	A	A	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Wilson Ave/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	41.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.228

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	26	96	637	0	160	346
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	96	637	0	160	346
Peak Hour Factor	0.9220	0.9220	0.8920	0.8920	0.8580	0.8580
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	26	179	0	47	101
Total Analysis Volume [veh/h]	28	104	714	0	186	403
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.23	0.16	0.01	0.00	0.21	0.00
d_M, Delay for Movement [s/veh]	40.95	17.29	0.00	0.00	10.17	0.00
Movement LOS	E	C	A	A	B	A
95th-Percentile Queue Length [veh/ln]	1.80	1.80	0.00	0.00	0.79	0.00
95th-Percentile Queue Length [ft/ln]	44.91	44.91	0.00	0.00	19.86	0.00
d_A, Approach Delay [s/veh]	22.31		0.00		3.21	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	3.37					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 3: Project Dwy/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	692	0	0	397
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	692	0	0	397
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	182	0	0	104
Total Analysis Volume [veh/h]	0	0	728	0	0	418
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	18.67	10.69	0.00	0.00	9.13	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	14.68		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Wilson Ave/North Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Wilson Ave					
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave					
Base Volume Input [veh/h]	0	122	196	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	122	196	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	32	52	0	0	0
Total Analysis Volume [veh/h]	0	128	206	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.64	0.00	0.00	0.00	10.45	9.31
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		9.88	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Wilson Ave/South Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Wilson Ave		Wilson Ave			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave		Wilson Ave			
Base Volume Input [veh/h]	0	122	196	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	122	196	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	32	52	0	0	0
Total Analysis Volume [veh/h]	0	128	206	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.64	0.00	0.00	0.00	10.45	9.31
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		9.88	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Existing PM_LOS.pdf

Scenario 2 2 Existing PM
1/3/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Redlands Ave/Rider St	8	52	116	21	52	21	23	555	0	13	363	21	1245

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
2	Wilson Ave/Rider St	26	96	637	0	160	346	1265

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
3	Project Dwy/Rider St	0	0	692	0	0	397	1089

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
4	Wilson Ave/North Project Dwy	0	122	196	0	0	0	318

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Wilson Ave/South Project Dwy	0	122	196	0	0	0	318

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Opening Year AM_LOS.pdf

Scenario 5 5 Opening Year AM
1/3/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Redlands Ave/Rider St	Signalized	HCM 6th Edition	EB Left	0.469	15.6	B
2	Wilson Ave/Rider St	Two-way stop	HCM 6th Edition	NB Left	0.589	128.3	F
3	Project Dwy/Rider St	Two-way stop	HCM 6th Edition	WB Thru	0.010	0.0	A
4	Wilson Ave/North Project Dwy	Two-way stop	HCM 6th Edition	SB Thru	0.003	0.0	A
5	Wilson Ave/South Project Dwy	Two-way stop	HCM 6th Edition	SB Thru	0.003	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Redlands Ave/Rider St

Control Type:	Signalized	Delay (sec / veh):	15.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.469

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	17	75	213	27	90	22	2	355	19	43	784	36
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	40	0	0	0	11	0	0	41	78
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	75	213	67	90	22	2	366	19	43	825	114
Peak Hour Factor	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	4	20	56	18	24	6	1	96	5	11	217	30
Total Analysis Volume [veh/h]	18	79	224	71	95	23	2	385	20	45	868	120
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	4	0	7	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	20	0	11	20	0	61	78	0	11	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	42	42	42	42	42	42	42	42	42	42	42	42
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	9	9	4	6	6	0	13	13	3	16	16
g / C, Green / Cycle	0.03	0.21	0.21	0.09	0.15	0.15	0.00	0.31	0.31	0.07	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.01	0.05	0.16	0.04	0.06	0.02	0.00	0.23	0.01	0.03	0.30	0.30
s, saturation flow rate [veh/h]	1603	1683	1431	1603	1683	1431	1603	1683	1431	1603	1683	1612
c, Capacity [veh/h]	52	351	298	152	245	208	6	523	444	111	632	606
d1, Uniform Delay [s]	19.96	13.85	15.65	18.06	16.29	15.63	20.93	12.98	10.15	18.79	11.73	11.73
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.00	0.32	3.81	2.22	1.00	0.23	26.01	2.04	0.04	2.39	2.37	2.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.35	0.23	0.75	0.47	0.39	0.11	0.32	0.74	0.05	0.41	0.80	0.80
d, Delay for Lane Group [s/veh]	23.96	14.17	19.45	20.28	17.29	15.86	46.94	15.02	10.19	21.18	14.09	14.20
Lane Group LOS	C	B	B	C	B	B	D	B	B	C	B	B
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.21	0.56	2.00	0.66	0.78	0.18	0.06	2.87	0.11	0.44	3.59	3.46
50th-Percentile Queue Length [ft/ln]	5.26	13.95	50.07	16.60	19.53	4.48	1.58	71.81	2.74	11.07	89.72	86.41
95th-Percentile Queue Length [veh/ln]	0.38	1.00	3.60	1.19	1.41	0.32	0.11	5.17	0.20	0.80	6.46	6.22
95th-Percentile Queue Length [ft/ln]	9.46	25.11	90.12	29.87	35.16	8.06	2.85	129.2	4.94	19.92	161.5	155.5

Movement, Approach, & Intersection Results

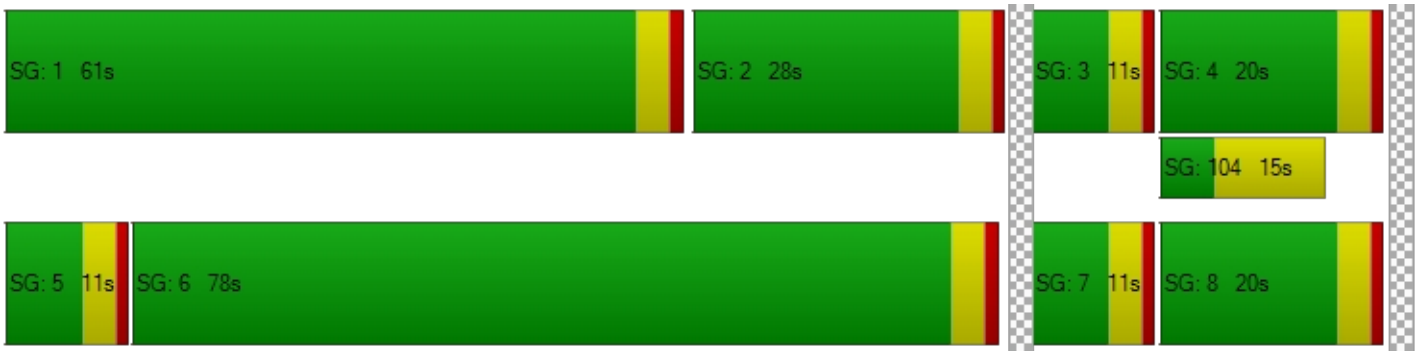
d_M, Delay for Movement [s/veh]	23.96	14.17	19.45	20.28	17.29	15.86	46.94	15.02	10.19	21.18	14.14	14.20
Movement LOS	C	B	B	C	B	B	D	B	B	C	B	B
d_A, Approach Delay [s/veh]	18.41			18.24			14.94			14.45		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	15.57											
Intersection LOS	B											
Intersection V/C	0.469											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	51.34
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	2.564
Crosswalk LOS	F	F	F	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1233	400
d_b, Bicycle Delay [s]	45.07	45.07	8.82	38.40
I_b,int, Bicycle LOS Score for Intersection	2.089	1.871	2.231	2.412
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Wilson Ave/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	128.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.589

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	27	153	552	17	304	842
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	51	0	2	119
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	160	603	17	306	961
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	42	159	4	81	253
Total Analysis Volume [veh/h]	28	168	635	18	322	1012
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.59	0.25	0.01	0.00	0.35	0.01
d_M, Delay for Movement [s/veh]	128.31	57.95	0.00	0.00	10.91	0.00
Movement LOS	F	F	A	A	B	A
95th-Percentile Queue Length [veh/ln]	6.50	6.50	0.00	0.00	1.56	0.00
95th-Percentile Queue Length [ft/ln]	162.60	162.60	0.00	0.00	38.94	0.00
d_A, Approach Delay [s/veh]	68.00		0.00		2.63	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	7.71					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 3: Project Dwy/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.010

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	594	0	0	863
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	51	0	0	119
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	645	0	0	982
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	170	0	0	258
Total Analysis Volume [veh/h]	0	0	679	0	0	1034
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	25.14	10.48	0.00	0.00	8.96	0.00
Movement LOS	D	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	17.81		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Wilson Ave/North Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Wilson Ave					
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave					
Base Volume Input [veh/h]	0	180	322	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	2	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	187	324	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	49	85	0	0	0
Total Analysis Volume [veh/h]	0	197	341	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.96	0.00	0.00	0.00	12.14	10.13
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		11.14	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Wilson Ave/South Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Wilson Ave		Wilson Ave			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave		Wilson Ave			
Base Volume Input [veh/h]	0	180	322	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	2	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	187	324	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	49	85	0	0	0
Total Analysis Volume [veh/h]	0	197	341	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.96	0.00	0.00	0.00	12.14	10.13
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		11.14	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Opening Year AM_LOS.pdf

Scenario 5 5 Opening Year AM
1/3/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Redlands Ave/Rider St	17	75	213	67	90	22	2	366	19	43	825	114	1853

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
2	Wilson Ave/Rider St	27	160	603	17	306	961	2074

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
3	Project Dwy/Rider St	0	0	645	0	0	982	1627

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
4	Wilson Ave/North Project Dwy	0	187	324	0	0	0	511

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Wilson Ave/South Project Dwy	0	187	324	0	0	0	511

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Opening Year PM_LOS.pdf

Scenario 6 6 Opening Year PM
1/3/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Redlands Ave/Rider St	Signalized	HCM 6th Edition	EB Thru	0.638	28.9	C
2	Wilson Ave/Rider St	Two-way stop	HCM 6th Edition	NB Left	0.494	105.3	F
3	Project Dwy/Rider St	Two-way stop	HCM 6th Edition	EB Thru	0.011	0.0	A
4	Wilson Ave/North Project Dwy	Two-way stop	HCM 6th Edition	SB Thru	0.002	0.0	A
5	Wilson Ave/South Project Dwy	Two-way stop	HCM 6th Edition	SB Thru	0.002	0.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Redlands Ave/Rider St

Control Type:	Signalized	Delay (sec / veh):	28.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.638

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	22	85	154	38	75	22	24	717	5	40	461	32
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	96	0	0	0	50	0	0	20	57
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	85	154	134	75	22	24	767	5	40	481	89
Peak Hour Factor	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	6	22	41	35	20	6	6	202	1	11	127	23
Total Analysis Volume [veh/h]	23	89	162	141	79	23	25	807	5	42	506	94
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	4	0	7	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	20	0	11	20	0	61	78	0	11	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	62	62	62	62	62	62	62	62	62	62	62	62
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	10	10	6	6	6	2	30	30	4	31	31
g / C, Green / Cycle	0.04	0.16	0.16	0.10	0.09	0.09	0.04	0.48	0.48	0.06	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.01	0.05	0.11	0.10	0.05	0.02	0.02	0.48	0.00	0.03	0.18	0.18
s, saturation flow rate [veh/h]	1603	1683	1431	1443	1683	1431	1603	1683	1431	1603	1683	1593
c, Capacity [veh/h]	61	272	231	280	159	135	65	814	692	95	845	800
d1, Uniform Delay [s]	29.14	23.03	24.60	27.29	26.70	25.86	29.01	15.91	8.31	28.20	9.41	9.42
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.45	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.83	0.70	3.84	1.40	2.39	0.59	3.69	27.87	0.00	3.20	0.26	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.38	0.33	0.70	0.50	0.50	0.17	0.38	0.99	0.01	0.44	0.36	0.37
d, Delay for Lane Group [s/veh]	32.97	23.73	28.45	28.69	29.09	26.45	32.71	43.78	8.31	31.40	9.67	9.70
Lane Group LOS	C	C	C	C	C	C	C	D	A	C	A	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.38	1.14	2.36	2.04	1.16	0.32	0.41	15.57	0.03	0.66	2.19	2.09
50th-Percentile Queue Length [ft/ln]	9.59	28.45	58.92	51.12	28.95	7.97	10.32	389.3	0.77	16.46	54.75	52.29
95th-Percentile Queue Length [veh/ln]	0.69	2.05	4.24	3.68	2.08	0.57	0.74	22.05	0.06	1.18	3.94	3.77
95th-Percentile Queue Length [ft/ln]	17.27	51.21	106.0	92.02	52.12	14.35	18.57	551.1	1.39	29.62	98.55	94.13

Movement, Approach, & Intersection Results

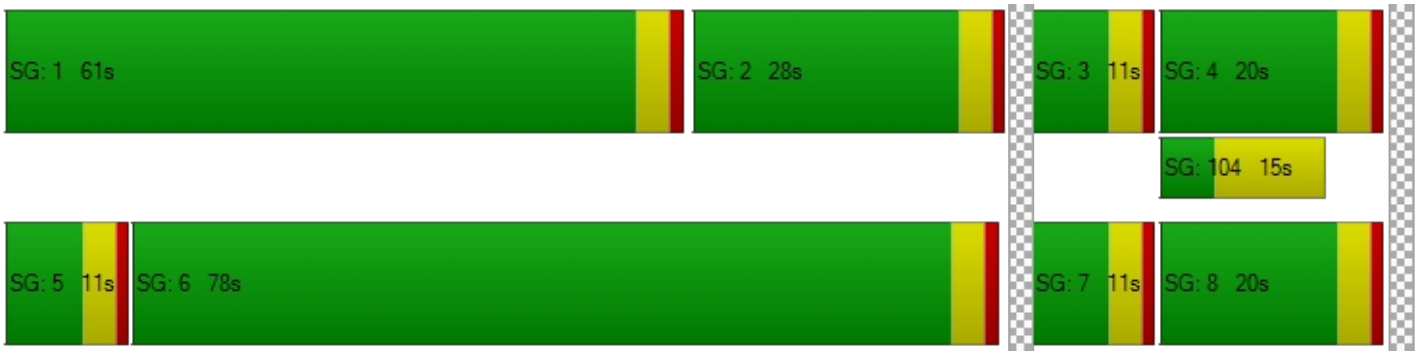
d_M, Delay for Movement [s/veh]	32.97	23.73	28.45	28.69	29.09	26.45	32.71	43.78	8.31	31.40	9.68	9.70
Movement LOS	C	C	C	C	C	C	C	D	A	C	A	A
d_A, Approach Delay [s/veh]	27.29			28.61			43.23			11.11		
Approach LOS	C			C			D			B		
d_I, Intersection Delay [s/veh]	28.93											
Intersection LOS	C											
Intersection V/C	0.638											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	51.34
I_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	2.580
Crosswalk LOS	F	F	F	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1233	400
d_b, Bicycle Delay [s]	45.07	45.07	8.82	38.40
I_b,int, Bicycle LOS Score for Intersection	2.012	1.961	2.941	2.089
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Wilson Ave/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	105.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.494

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	27	101	861	0	169	482
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	146	0	9	77
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	105	1007	0	178	559
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	28	265	0	47	147
Total Analysis Volume [veh/h]	28	111	1060	0	187	588
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.49	0.22	0.01	0.00	0.29	0.01
d_M, Delay for Movement [s/veh]	105.30	49.12	0.00	0.00	12.71	0.00
Movement LOS	F	E	A	A	B	A
95th-Percentile Queue Length [veh/ln]	4.58	4.58	0.00	0.00	1.18	0.00
95th-Percentile Queue Length [ft/ln]	114.48	114.48	0.00	0.00	29.51	0.00
d_A, Approach Delay [s/veh]	60.44		0.00		3.07	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	5.46					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 3: Project Dwy/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	908	0	0	532
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	146	0	0	77
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1054	0	0	609
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	277	0	0	160
Total Analysis Volume [veh/h]	0	0	1109	0	0	641
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	33.67	12.57	0.00	0.00	10.76	0.00
Movement LOS	D	B	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	23.12		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Wilson Ave/North Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Wilson Ave					
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave					
Base Volume Input [veh/h]	0	129	207	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	9	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	133	216	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	35	57	0	0	0
Total Analysis Volume [veh/h]	0	140	227	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.68	0.00	0.00	0.00	10.69	9.43
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		10.06	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Wilson Ave/South Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Wilson Ave		Wilson Ave			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave		Wilson Ave			
Base Volume Input [veh/h]	0	129	207	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	9	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	133	216	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	35	57	0	0	0
Total Analysis Volume [veh/h]	0	140	227	0	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.68	0.00	0.00	0.00	10.69	9.43
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.00		0.00		10.06	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Redlands Ave/Rider St	22	85	154	134	75	22	24	767	5	40	481	89	1898

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
2	Wilson Ave/Rider St	27	105	1007	0	178	559	1876

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
3	Project Dwy/Rider St	0	0	1054	0	0	609	1663

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
4	Wilson Ave/North Project Dwy	0	133	216	0	0	0	349

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Wilson Ave/South Project Dwy	0	133	216	0	0	0	349

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Existing Plus Project AM_LOS.pdf

Scenario 3 3 Existing + Project AM
1/3/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Redlands Ave/Rider St	Signalized	HCM 6th Edition	EB Left	0.382	13.9	B
2	Wilson Ave/Rider St	Two-way stop	HCM 6th Edition	NB Left	0.575	103.8	F
3	Project Dwy/Rider St	Two-way stop	HCM 6th Edition	NB Right	0.003	9.9	A
4	Wilson Ave/North Project Dwy	Two-way stop	HCM 6th Edition	EB Left	0.006	12.0	B
5	Wilson Ave/South Project Dwy	Two-way stop	HCM 6th Edition	EB Left	0.004	12.0	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Redlands Ave/Rider St

Control Type:	Signalized	Delay (sec / veh):	13.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.382

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	13	52	183	21	52	21	2	289	6	16	632	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	9	0	0	0	8	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	52	183	30	52	21	2	297	6	16	632	24
Peak Hour Factor	0.848	0.848	0.848	0.950	0.950	0.950	0.835	0.835	0.835	0.927	0.927	0.927
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	4	15	54	8	14	6	1	89	2	4	170	6
Total Analysis Volume [veh/h]	15	61	216	32	55	22	2	356	7	17	682	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	4	0	7	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	20	0	11	20	0	61	78	0	11	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	34	34	34	34	34	34	34	34	34	34	34	34
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	7	7	2	6	6	0	9	9	1	10	10
g / C, Green / Cycle	0.03	0.21	0.21	0.05	0.18	0.18	0.00	0.27	0.27	0.03	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.01	0.04	0.15	0.02	0.03	0.02	0.00	0.21	0.00	0.01	0.21	0.21
s, saturation flow rate [veh/h]	1603	1683	1431	1603	1683	1431	1603	1683	1431	1603	1683	1661
c, Capacity [veh/h]	45	348	296	88	303	257	6	457	389	50	503	496
d1, Uniform Delay [s]	16.49	11.29	12.82	15.76	12.02	11.81	17.17	11.63	9.22	16.40	10.78	10.78
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.37	0.24	3.47	2.54	0.29	0.14	25.55	2.91	0.02	3.96	1.85	1.88
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.18	0.73	0.37	0.18	0.09	0.31	0.78	0.02	0.34	0.71	0.71
d, Delay for Lane Group [s/veh]	20.87	11.53	16.29	18.30	12.31	11.95	42.72	14.54	9.23	20.36	12.63	12.66
Lane Group LOS	C	B	B	B	B	B	D	B	A	C	B	B
Critical Lane Group	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.15	0.32	1.48	0.26	0.31	0.12	0.06	2.22	0.03	0.16	1.99	1.97
50th-Percentile Queue Length [ft/ln]	3.78	8.03	37.08	6.57	7.66	3.03	1.47	55.40	0.77	4.12	49.73	49.23
95th-Percentile Queue Length [veh/ln]	0.27	0.58	2.67	0.47	0.55	0.22	0.11	3.99	0.06	0.30	3.58	3.54
95th-Percentile Queue Length [ft/ln]	6.81	14.45	66.75	11.83	13.78	5.45	2.64	99.71	1.38	7.41	89.51	88.62

Movement, Approach, & Intersection Results

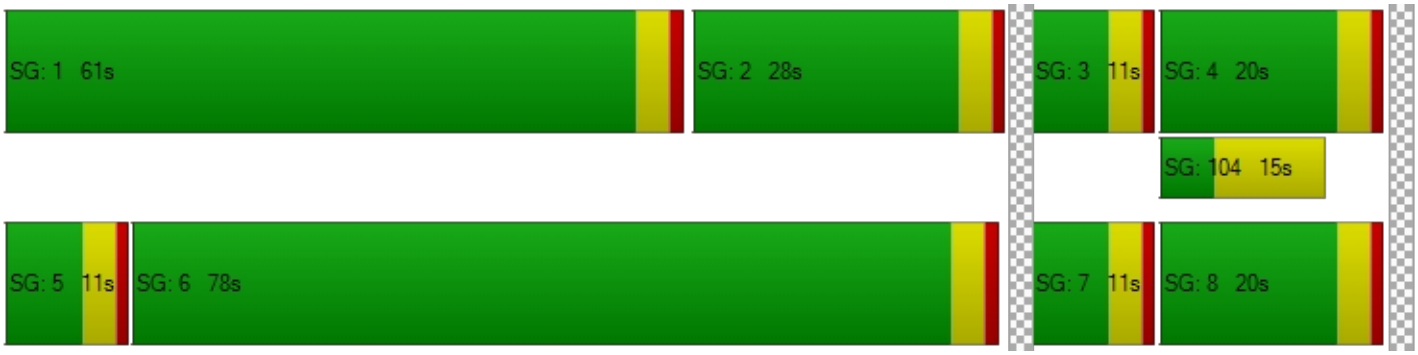
d_M, Delay for Movement [s/veh]	20.87	11.53	16.29	18.30	12.31	11.95	42.72	14.54	9.23	20.36	12.65	12.66
Movement LOS	C	B	B	B	B	B	D	B	A	C	B	B
d_A, Approach Delay [s/veh]	15.53			13.99			14.59			12.83		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	13.87											
Intersection LOS	B											
Intersection V/C	0.382											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	51.34
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	2.470
Crosswalk LOS	F	F	F	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1233	400
d_b, Bicycle Delay [s]	45.07	45.07	8.82	38.40
l_b,int, Bicycle LOS Score for Intersection	2.041	1.739	2.162	2.158
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Wilson Ave/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	103.8
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.575

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	26	144	451	16	287	642
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	2	0	11	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	146	451	27	293	642
Peak Hour Factor	0.7930	0.7930	0.8050	0.8050	0.8770	0.8770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	46	140	8	84	183
Total Analysis Volume [veh/h]	37	184	560	34	334	732
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.58	0.26	0.01	0.00	0.34	0.01
d_M, Delay for Movement [s/veh]	103.77	52.82	0.00	0.00	10.58	0.00
Movement LOS	F	F	A	A	B	A
95th-Percentile Queue Length [veh/ln]	6.73	6.73	0.00	0.00	1.53	0.00
95th-Percentile Queue Length [ft/ln]	168.23	168.23	0.00	0.00	38.17	0.00
d_A, Approach Delay [s/veh]	61.35		0.00		3.31	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	9.09					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 3: Project Dwy/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	493	0	0	670
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	9	8	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	2	502	8	0	673
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	132	2	0	177
Total Analysis Volume [veh/h]	0	2	528	8	0	708
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	17.69	9.94	0.00	0.00	8.50	0.00
Movement LOS	C	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.21	0.21	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.94		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.02					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Wilson Ave/North Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	12.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Wilson Ave					
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave					
Base Volume Input [veh/h]	0	170	304	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	8	9	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	172	312	9	3	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	45	82	2	1	0
Total Analysis Volume [veh/h]	0	181	328	9	3	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	7.95	0.00	0.00	0.00	11.95	10.12
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.02	0.02
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.43	0.43
d_A, Approach Delay [s/veh]	0.00		0.00		11.95	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.07					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Wilson Ave/South Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	12.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Wilson Ave		Wilson Ave			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave		Wilson Ave			
Base Volume Input [veh/h]	0	170	304	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	0	2	6	2	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	170	306	6	2	2
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	45	81	2	1	1
Total Analysis Volume [veh/h]	6	179	322	6	2	2
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.94	0.00	0.00	0.00	12.01	10.07
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.02	0.02
95th-Percentile Queue Length [ft/ln]	0.37	0.37	0.00	0.00	0.50	0.50
d_A, Approach Delay [s/veh]	0.26		0.00		11.04	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.18					
Intersection LOS	B					

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Report File: Z:\...\Existing Plus Project AM_LOS.pdf
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Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Redlands Ave/Rider St	13	52	183	30	52	21	2	297	6	16	632	24	1328

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
2	Wilson Ave/Rider St	29	146	451	27	293	642	1588

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
3	Project Dwy/Rider St	0	2	502	8	0	673	1185

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
4	Wilson Ave/North Project Dwy	0	172	312	9	3	0	496

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Wilson Ave/South Project Dwy	6	170	306	6	2	2	492

Option 1: Traffc Signal

Number	2					
Intersection	Wilson Ave/Rider St					
Control Type	Signalized					
Analysis Method	HCM 6th Edition					
Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Base Volume Input [veh/h]	26	144	451	16	287	642
Total Analysis Volume [veh/h]	29	144	453	25	287	648

Intersection Settings

Cycle Length [s]	120					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fully actuated					
Lost time [s]	6.00					
Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	4	0	2	0	6	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	7	0	7	0	7	7
Maximum Green [s]	30	0	30	0	30	30
Amber [s]	3.0	0.0	3.0	0.0	3.0	3.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	83	0	37	0	37	37
Walk [s]	5	0	5	0	0	0
Pedestrian Clearance [s]	10	0	10	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
l1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
Minimum Recall	No		No			No
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Pedestrian Signal Group	0					
Pedestrian Walk [s]	0					
Pedestrian Clearance [s]	0					

Lane Group Calculations

g / C, Green / Cycle	0.16	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.12	0.27	0.02	0.34	0.20
so, Base Saturation Flow per Lane [pc/h/ln]	1900	1900	1900	1900	1900
Arrival type	3	3		3	
s, saturation flow rate [veh/h]	1457	1683	1431	844	3204
c, Capacity [veh/h]	241	1025	871	563	1951
X, volume / capacity	0.72	0.44	0.03	0.51	0.33
d, Delay for Lane Group [s/veh]	17.98	4.01	2.77	9.57	3.50
Lane Group LOS	B	A	A	A	A

Critical Lane Group	Yes		No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.31		0.67	0.03	1.31	0.41
50th-Percentile Queue Length [ft/ln]	32.82		16.83	0.68	32.68	10.30
95th-Percentile Queue Length [veh/ln]	2.36		1.21	0.05	2.35	0.74
95th-Percentile Queue Length [ft/ln]	59.08		30.29	1.23	58.83	18.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.98	17.98	4.01	2.77	9.57	3.50
Movement LOS	B	B	A	A	A	A
Critical Movement	No	Yes	No	No	No	No
d_A, Approach Delay [s/veh]	17.98		3.95		5.36	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	6.31					
Intersection LOS	A					
Intersection V/C	0.553					

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Report File: Z:\...\Existing Plus Project PM_LOS.pdf

Scenario 4 4 Existing + Project PM
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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Redlands Ave/Rider St	Signalized	HCM 6th Edition	NB Left	0.485	14.0	B
2	Wilson Ave/Rider St	Two-way stop	HCM 6th Edition	NB Left	0.315	45.7	E
3	Project Dwy/Rider St	Two-way stop	HCM 6th Edition	EB Thru	0.007	0.0	A
4	Wilson Ave/North Project Dwy	Two-way stop	HCM 6th Edition	EB Left	0.014	10.7	B
5	Wilson Ave/South Project Dwy	Two-way stop	HCM 6th Edition	EB Left	0.012	10.7	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Redlands Ave/Rider St

Control Type:	Signalized	Delay (sec / veh):	14.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.485

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	8	52	116	21	52	21	23	555	0	13	363	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	3	0	0	0	4	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	52	116	24	52	21	23	559	0	13	363	30
Peak Hour Factor	0.864	0.864	0.864	0.950	0.950	0.950	0.881	0.881	0.881	0.930	0.930	0.930
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	2	15	34	6	14	6	7	159	0	3	98	8
Total Analysis Volume [veh/h]	9	60	134	25	55	22	26	635	0	14	390	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	4	0	7	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	20	0	11	20	0	61	78	0	11	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	42	42	42	42	42	42	42	42	42	42	42	42
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	6	6	2	5	5	2	18	18	1	17	17
g / C, Green / Cycle	0.02	0.15	0.15	0.04	0.12	0.12	0.04	0.43	0.43	0.03	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.01	0.04	0.09	0.02	0.03	0.02	0.02	0.38	0.00	0.01	0.13	0.13
s, saturation flow rate [veh/h]	1603	1683	1431	1603	1683	1431	1603	1683	1431	1603	1683	1639
c, Capacity [veh/h]	27	251	214	69	208	176	71	725	616	41	693	675
d1, Uniform Delay [s]	20.59	15.90	16.92	19.72	16.83	16.54	19.67	11.04	0.00	20.29	8.39	8.40
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.86	0.49	3.01	3.19	0.67	0.31	3.11	3.58	0.00	4.80	0.25	0.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.24	0.63	0.36	0.26	0.12	0.37	0.88	0.00	0.34	0.31	0.31
d, Delay for Lane Group [s/veh]	27.45	16.39	19.93	22.90	17.51	16.85	22.78	14.61	0.00	25.09	8.64	8.66
Lane Group LOS	C	B	B	C	B	B	C	B	A	C	A	A
Critical Lane Group	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.13	0.48	1.23	0.27	0.46	0.18	0.28	4.60	0.00	0.18	1.03	1.01
50th-Percentile Queue Length [ft/ln]	3.26	11.89	30.71	6.83	11.49	4.52	7.04	115.1	0.00	4.39	25.75	25.34
95th-Percentile Queue Length [veh/ln]	0.23	0.86	2.21	0.49	0.83	0.33	0.51	8.12	0.00	0.32	1.85	1.82
95th-Percentile Queue Length [ft/ln]	5.86	21.40	55.28	12.29	20.69	8.13	12.68	203.0	0.00	7.90	46.34	45.60

Movement, Approach, & Intersection Results

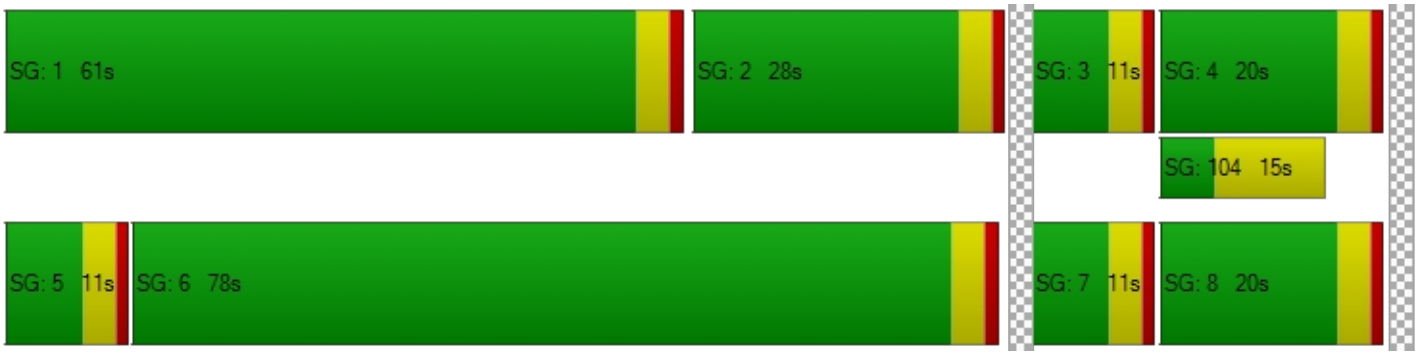
d_M, Delay for Movement [s/veh]	27.45	16.39	19.93	22.90	17.51	16.85	22.78	14.61	0.00	25.09	8.65	8.66
Movement LOS	C	B	B	C	B	B	C	B	A	C	A	A
d_A, Approach Delay [s/veh]	19.22			18.69			14.94			9.18		
Approach LOS	B			B			B			A		
d_I, Intersection Delay [s/veh]	14.04											
Intersection LOS	B											
Intersection V/C	0.485											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	51.34
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	2.446
Crosswalk LOS	F	F	F	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1233	400
d_b, Bicycle Delay [s]	45.07	45.07	8.82	38.40
l_b,int, Bicycle LOS Score for Intersection	1.895	1.728	2.650	1.919
Bicycle LOS	A	A	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Wilson Ave/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	45.7
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.315

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	26	96	637	0	160	346
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	8	0	7	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	104	637	7	163	346
Peak Hour Factor	0.9220	0.9220	0.8920	0.8920	0.8580	0.8580
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	28	179	2	47	101
Total Analysis Volume [veh/h]	38	113	714	8	190	403
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.32	0.18	0.01	0.00	0.22	0.00
d_M, Delay for Movement [s/veh]	45.73	21.48	0.00	0.00	10.24	0.00
Movement LOS	E	C	A	A	B	A
95th-Percentile Queue Length [veh/ln]	2.57	2.57	0.00	0.00	0.82	0.00
95th-Percentile Queue Length [ft/ln]	64.20	64.20	0.00	0.00	20.58	0.00
d_A, Approach Delay [s/veh]	27.58		0.00		3.28	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	4.17					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 3: Project Dwy/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	0.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	692	0	0	397
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	7	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	699	0	0	406
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	184	0	0	107
Total Analysis Volume [veh/h]	0	0	736	0	0	427
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	18.93	10.72	0.00	0.00	9.16	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	14.83		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Wilson Ave/North Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.014

Intersection Setup

Name	Wilson Ave					
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave					
Base Volume Input [veh/h]	0	122	196	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	7	3	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	130	203	3	9	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	34	53	1	2	0
Total Analysis Volume [veh/h]	0	137	214	3	9	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	7.66	0.00	0.00	0.00	10.66	9.45
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	1.06	1.06
d_A, Approach Delay [s/veh]	0.00		0.00		10.66	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.26					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Wilson Ave/South Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	Wilson Ave		Wilson Ave			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave		Wilson Ave			
Base Volume Input [veh/h]	0	122	196	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	7	8	18
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	122	196	7	8	18
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	32	52	2	2	5
Total Analysis Volume [veh/h]	3	128	206	7	8	19
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	7.66	0.00	0.00	0.00	10.70	9.50
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.11	0.11
95th-Percentile Queue Length [ft/ln]	0.17	0.17	0.00	0.00	2.73	2.73
d_A, Approach Delay [s/veh]	0.18		0.00		9.86	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.78					
Intersection LOS	B					

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Existing Plus Project PM_LOS.pdf
Scenario 4 4 Existing + Project PM
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Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Redlands Ave/Rider St	8	52	116	24	52	21	23	559	0	13	363	30	1261

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
2	Wilson Ave/Rider St	35	104	637	7	163	346	1292

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
3	Project Dwy/Rider St	0	0	699	0	0	406	1105

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
4	Wilson Ave/North Project Dwy	0	130	203	3	9	0	345

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Wilson Ave/South Project Dwy	3	122	196	7	8	18	354

Option 1: Traffic Signal

Number	2					
Intersection	Wilson Ave/Rider St					
Control Type	Signalized					
Analysis Method	HCM 6th Edition					
Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Base Volume Input [veh/h]	26	96	637	0	160	346
Total Analysis Volume [veh/h]	35	96	645	3	160	349

Intersection Settings

Cycle Length [s]	120					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fully actuated					
Lost time [s]	6.00					
Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	4	0	2	0	0	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	7	0	7	0	0	7
Maximum Green [s]	30	0	30	0	0	30
Amber [s]	3.0	0.0	3.0	0.0	0.0	3.0
All red [s]	1.0	0.0	1.0	0.0	0.0	1.0
Split [s]	83	0	37	0	0	37
Walk [s]	5	0	5	0	0	0
Pedestrian Clearance [s]	10	0	10	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
l1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
Minimum Recall	No		No			No
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Pedestrian Signal Group	0					
Pedestrian Walk [s]	0					
Pedestrian Clearance [s]	0					

Lane Group Calculations

g / C, Green / Cycle	0.15	0.60	0.60	0.60	0.60
(v / s)_i Volume / Saturation Flow Rate	0.09	0.38	0.00	0.23	0.11
so, Base Saturation Flow per Lane [pc/h/ln]	1900	1900	1900	1900	1900
Arrival type	3	3		3	
s, saturation flow rate [veh/h]	1473	1683	1431	707	3204
c, Capacity [veh/h]	228	1006	855	437	1915
X, volume / capacity	0.58	0.64	0.00	0.37	0.18
d, Delay for Lane Group [s/veh]	14.96	4.93	2.62	10.64	2.98
Lane Group LOS	B	A	A	B	A

Critical Lane Group	Yes		Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.82		0.93	0.00	0.75	0.15
50th-Percentile Queue Length [ft/ln]	20.54		23.20	0.06	18.85	3.74
95th-Percentile Queue Length [veh/ln]	1.48		1.67	0.00	1.36	0.27
95th-Percentile Queue Length [ft/ln]	36.97		41.75	0.11	33.92	6.74

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.96	14.96	4.93	2.62	10.64	2.98
Movement LOS	B	B	A	A	B	A
Critical Movement	No	Yes	No	No	No	No
d_A, Approach Delay [s/veh]	14.96		4.91		5.39	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	6.12					
Intersection LOS	A					
Intersection V/C	0.580					

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Opening Year Plus Project AM_LOS.pdf
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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Redlands Ave/Rider St	Signalized	HCM 6th Edition	EB Left	0.470	15.7	B
2	Wilson Ave/Rider St	Two-way stop	HCM 6th Edition	NB Left	0.696	157.3	F
3	Project Dwy/Rider St	Two-way stop	HCM 6th Edition	NB Right	0.005	10.6	B
4	Wilson Ave/North Project Dwy	Two-way stop	HCM 6th Edition	EB Left	0.006	12.3	B
5	Wilson Ave/South Project Dwy	Two-way stop	HCM 6th Edition	EB Left	0.004	12.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Redlands Ave/Rider St

Control Type:	Signalized	Delay (sec / veh):	15.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.470

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	17	75	213	27	90	22	2	355	19	43	784	36
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	42	0	0	0	28	0	0	43	79
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	75	213	69	90	22	2	383	19	43	827	115
Peak Hour Factor	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	4	20	56	18	24	6	1	101	5	11	218	30
Total Analysis Volume [veh/h]	18	79	224	73	95	23	2	403	20	45	871	121
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	4	0	7	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	20	0	11	20	0	61	78	0	11	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	42	42	42	42	42	42	42	42	42	42	42	42
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	9	9	4	6	6	0	13	13	3	16	16
g / C, Green / Cycle	0.03	0.21	0.21	0.10	0.14	0.14	0.00	0.31	0.31	0.07	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.01	0.05	0.16	0.05	0.06	0.02	0.00	0.24	0.01	0.03	0.30	0.30
s, saturation flow rate [veh/h]	1603	1683	1431	1603	1683	1431	1603	1683	1431	1603	1683	1612
c, Capacity [veh/h]	51	351	298	155	242	206	6	525	446	111	634	607
d1, Uniform Delay [s]	20.01	13.89	15.69	18.07	16.40	15.73	20.98	13.16	10.15	18.84	11.74	11.74
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.00	0.32	3.81	2.23	1.03	0.24	26.01	2.40	0.04	2.39	2.37	2.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.35	0.23	0.75	0.47	0.39	0.11	0.32	0.77	0.04	0.41	0.80	0.80
d, Delay for Lane Group [s/veh]	24.02	14.21	19.51	20.29	17.43	15.97	46.99	15.55	10.19	21.23	14.11	14.22
Lane Group LOS	C	B	B	C	B	B	D	B	B	C	B	B
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.21	0.56	2.01	0.68	0.79	0.18	0.06	3.09	0.11	0.44	3.61	3.48
50th-Percentile Queue Length [ft/ln]	5.27	14.00	50.25	17.08	19.68	4.51	1.58	77.20	2.75	11.10	90.36	87.01
95th-Percentile Queue Length [veh/ln]	0.38	1.01	3.62	1.23	1.42	0.32	0.11	5.56	0.20	0.80	6.51	6.27
95th-Percentile Queue Length [ft/ln]	9.49	25.21	90.45	30.75	35.43	8.11	2.85	138.9	4.94	19.99	162.6	156.6

Movement, Approach, & Intersection Results

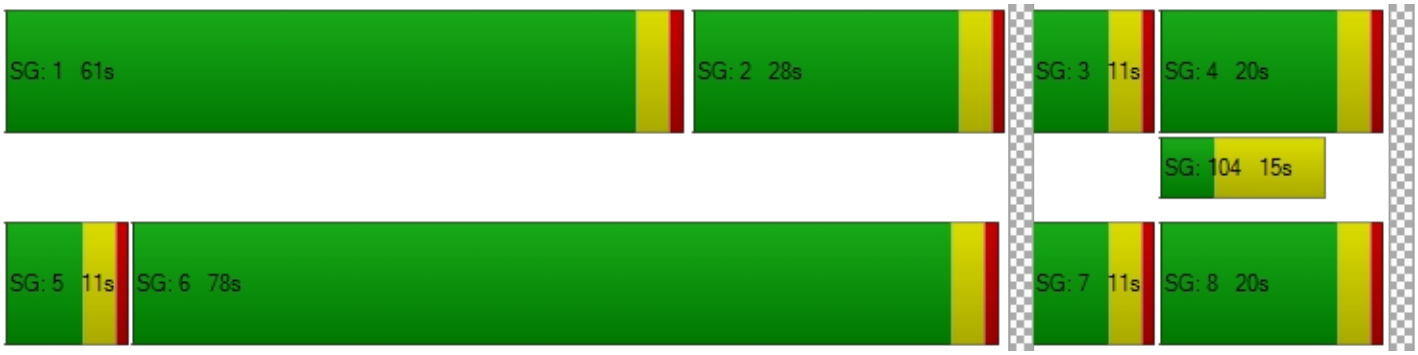
d_M, Delay for Movement [s/veh]	24.02	14.21	19.51	20.29	17.43	15.97	46.99	15.55	10.19	21.23	14.16	14.22
Movement LOS	C	B	B	C	B	B	D	B	B	C	B	B
d_A, Approach Delay [s/veh]	18.46			18.35			15.45			14.47		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	15.70											
Intersection LOS	B											
Intersection V/C	0.470											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	51.34
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	2.570
Crosswalk LOS	F	F	F	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1233	400
d_b, Bicycle Delay [s]	45.07	45.07	8.82	38.40
l_b,int, Bicycle LOS Score for Intersection	2.089	1.875	2.261	2.415
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Wilson Ave/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	157.3
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.696

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	27	153	552	17	304	842
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	9	51	12	8	119
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	162	603	29	312	961
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	43	159	8	82	253
Total Analysis Volume [veh/h]	32	171	635	31	328	1012
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.70	0.25	0.01	0.00	0.36	0.01
d_M, Delay for Movement [s/veh]	157.27	84.23	0.00	0.00	11.07	0.00
Movement LOS	F	F	A	A	B	A
95th-Percentile Queue Length [veh/ln]	8.06	8.06	0.00	0.00	1.63	0.00
95th-Percentile Queue Length [ft/ln]	201.57	201.57	0.00	0.00	40.71	0.00
d_A, Approach Delay [s/veh]	95.75		0.00		2.71	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	10.44					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 3: Project Dwy/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	594	0	0	863
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	60	10	0	122
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	3	654	10	0	985
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	172	3	0	259
Total Analysis Volume [veh/h]	0	3	688	11	0	1037
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	25.65	10.59	0.00	0.00	9.03	0.00
Movement LOS	D	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.35	0.35	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.59		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.02					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 4: Wilson Ave/North Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Wilson Ave					
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave					
Base Volume Input [veh/h]	0	180	322	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	9	11	9	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	189	333	9	3	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	50	88	2	1	0
Total Analysis Volume [veh/h]	0	199	351	9	3	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	8.00	0.00	0.00	0.00	12.35	10.27
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.02	0.02
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.46	0.46
d_A, Approach Delay [s/veh]	0.00		0.00		12.35	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.07					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Wilson Ave/South Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Wilson Ave		Wilson Ave			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave		Wilson Ave			
Base Volume Input [veh/h]	0	180	322	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	7	5	6	2	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	187	327	6	2	1
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	49	86	2	1	0
Total Analysis Volume [veh/h]	4	197	344	6	2	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	7.99	0.00	0.00	0.00	12.34	10.21
Movement LOS	A	A	A	A	B	B
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	0.02	0.02
95th-Percentile Queue Length [ft/ln]	0.25	0.25	0.00	0.00	0.41	0.41
d_A, Approach Delay [s/veh]	0.16		0.00		11.63	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.12					
Intersection LOS	B					

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Opening Year Plus Project AM_LOS.pdf
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Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Redlands Ave/Rider St	17	75	213	69	90	22	2	383	19	43	827	115	1875

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
2	Wilson Ave/Rider St	30	162	603	29	312	961	2097

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
3	Project Dwy/Rider St	0	3	654	10	0	985	1652

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
4	Wilson Ave/North Project Dwy	0	189	333	9	3	0	534

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Wilson Ave/South Project Dwy	4	187	327	6	2	1	527

Option 1: Traffic Signal

Number	2					
Intersection	Wilson Ave/Rider St					
Control Type	Signalized					
Analysis Method	HCM 6th Edition					
Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Base Volume Input [veh/h]	27	153	552	17	304	842
Total Analysis Volume [veh/h]	31	160	605	29	306	967

Intersection Settings

Cycle Length [s]	120					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fully actuated					
Lost time [s]	6.00					
Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	4	0	2	0	0	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	7	0	7	0	0	7
Maximum Green [s]	30	0	30	0	0	30
Amber [s]	3.0	0.0	3.0	0.0	0.0	3.0
All red [s]	1.0	0.0	1.0	0.0	0.0	1.0
Split [s]	83	0	37	0	0	37
Walk [s]	5	0	5	0	0	0
Pedestrian Clearance [s]	10	0	10	0	0	10
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
l1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
Minimum Recall	No		No			No
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Pedestrian Signal Group	0					
Pedestrian Walk [s]	0					
Pedestrian Clearance [s]	0					

Lane Group Calculations

g / C, Green / Cycle	0.17	0.66	0.66	0.66	0.66
(v / s)_i Volume / Saturation Flow Rate	0.13	0.36	0.02	0.42	0.30
so, Base Saturation Flow per Lane [pc/h/ln]	1900	1900	1900	1900	1900
Arrival type	3	3		3	
s, saturation flow rate [veh/h]	1456	1683	1431	733	3204
c, Capacity [veh/h]	242	1108	942	460	2109
X, volume / capacity	0.79	0.55	0.03	0.67	0.46
d, Delay for Lane Group [s/veh]	23.90	4.62	2.73	16.31	3.97
Lane Group LOS	C	A	A	B	A

Critical Lane Group	Yes		No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.07		1.49	0.05	2.74	1.03
50th-Percentile Queue Length [ft/ln]	51.68		37.24	1.14	68.58	25.86
95th-Percentile Queue Length [veh/ln]	3.72		2.68	0.08	4.94	1.86
95th-Percentile Queue Length [ft/ln]	93.03		67.03	2.06	123.45	46.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.90	23.90	4.62	2.73	16.31	3.97
Movement LOS	C	C	A	A	B	A
Critical Movement	No	Yes	No	No	No	No
d_A, Approach Delay [s/veh]	23.90		4.53		6.94	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	7.75					
Intersection LOS	A					
Intersection V/C	0.632					

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Opening Year Plus Project PM_LOS.pdf
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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Redlands Ave/Rider St	Signalized	HCM 6th Edition	EB Thru	0.643	30.0	C
2	Wilson Ave/Rider St	Two-way stop	HCM 6th Edition	NB Left	0.688	150.1	F
3	Project Dwy/Rider St	Two-way stop	HCM 6th Edition	NB Right	0.030	12.9	B
4	Wilson Ave/North Project Dwy	Two-way stop	HCM 6th Edition	EB Left	0.015	11.0	B
5	Wilson Ave/South Project Dwy	Two-way stop	HCM 6th Edition	EB Left	0.013	11.0	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Redlands Ave/Rider St

Control Type:	Signalized	Delay (sec / veh):	30.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	22	85	154	38	75	22	24	717	5	40	461	32
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	97	0	0	0	57	0	0	27	59
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	85	154	135	75	22	24	774	5	40	488	91
Peak Hour Factor	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	6	22	41	36	20	6	6	204	1	11	128	24
Total Analysis Volume [veh/h]	23	89	162	142	79	23	25	815	5	42	514	96
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi	Protec	Permi	Permi
Signal Group	3	4	0	7	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	20	0	11	20	0	61	78	0	11	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	62	62	62	62	62	62	62	62	62	62	62	62
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	10	10	6	6	6	2	30	30	4	31	31
g / C, Green / Cycle	0.04	0.16	0.16	0.10	0.09	0.09	0.04	0.48	0.48	0.06	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.01	0.05	0.11	0.10	0.05	0.02	0.02	0.48	0.00	0.03	0.19	0.19
s, saturation flow rate [veh/h]	1603	1683	1431	1442	1683	1431	1603	1683	1431	1603	1683	1592
c, Capacity [veh/h]	61	272	231	280	159	135	65	813	691	95	845	799
d1, Uniform Delay [s]	29.14	23.03	24.60	27.31	26.70	25.87	29.02	16.03	8.31	28.20	9.45	9.46
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.45	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.83	0.69	3.83	1.42	2.40	0.59	3.69	30.48	0.00	3.20	0.27	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.38	0.33	0.70	0.51	0.50	0.17	0.38	1.00	0.01	0.44	0.37	0.37
d, Delay for Lane Group [s/veh]	32.98	23.72	28.42	28.73	29.10	26.46	32.71	46.52	8.32	31.40	9.72	9.75
Lane Group LOS	C	C	C	C	C	C	C	F	A	C	A	A
Critical Lane Group	No	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.38	1.14	2.36	2.06	1.16	0.32	0.41	16.31	0.03	0.66	2.24	2.14
50th-Percentile Queue Length [ft/ln]	9.60	28.45	58.90	51.54	28.96	7.98	10.32	407.7	0.77	16.46	55.93	53.39
95th-Percentile Queue Length [veh/ln]	0.69	2.05	4.24	3.71	2.09	0.57	0.74	22.97	0.06	1.19	4.03	3.84
95th-Percentile Queue Length [ft/ln]	17.27	51.20	106.0	92.77	52.13	14.36	18.57	574.2	1.39	29.63	100.6	96.11

Movement, Approach, & Intersection Results

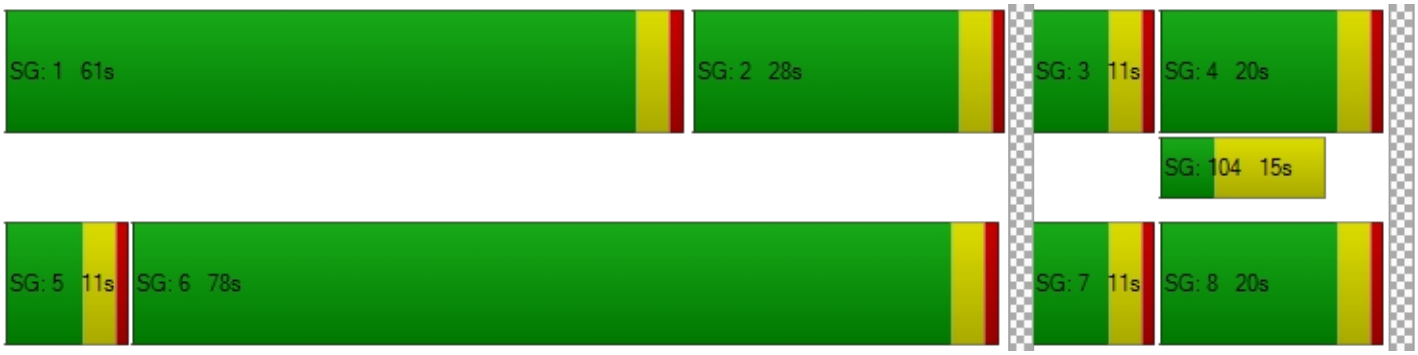
d_M, Delay for Movement [s/veh]	32.98	23.72	28.42	28.73	29.10	26.46	32.71	46.52	8.32	31.40	9.73	9.75
Movement LOS	C	C	C	C	C	C	C	F	A	C	A	A
d_A, Approach Delay [s/veh]	27.28			28.63			45.88			11.13		
Approach LOS	C			C			D			B		
d_I, Intersection Delay [s/veh]	30.02											
Intersection LOS	C											
Intersection V/C	0.643											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	51.34
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	0.000	2.585
Crosswalk LOS	F	F	F	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1233	400
d_b, Bicycle Delay [s]	45.07	45.07	8.82	38.40
l_b,int, Bicycle LOS Score for Intersection	2.012	1.962	2.954	2.098
Bicycle LOS	B	A	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Wilson Ave/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	150.1
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	1	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	500.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	27	101	861	0	169	482
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	12	146	16	12	77
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	113	1007	16	181	559
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	30	265	4	48	147
Total Analysis Volume [veh/h]	38	119	1060	17	191	588
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.69	0.24	0.01	0.00	0.30	0.01
d_M, Delay for Movement [s/veh]	150.13	92.21	0.00	0.00	12.94	0.00
Movement LOS	F	F	A	A	B	A
95th-Percentile Queue Length [veh/ln]	6.97	6.97	0.00	0.00	1.24	0.00
95th-Percentile Queue Length [ft/ln]	174.15	174.15	0.00	0.00	31.00	0.00
d_A, Approach Delay [s/veh]	106.23		0.00		3.17	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	9.51					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 3: Project Dwy/Rider St

Control Type:	Two-way stop	Delay (sec / veh):	12.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

Intersection Setup

Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name						
Base Volume Input [veh/h]	0	0	908	0	0	532
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	149	5	0	86
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	13	1057	5	0	618
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	3	278	1	0	163
Total Analysis Volume [veh/h]	0	14	1113	5	0	651
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.03	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	34.41	12.85	0.00	0.00	10.80	0.00
Movement LOS	D	B	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.09	0.09	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.29	2.29	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	12.85		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.10					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 4: Wilson Ave/North Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	Wilson Ave					
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave					
Base Volume Input [veh/h]	0	129	207	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	12	25	3	9	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	141	232	3	9	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	37	61	1	2	0
Total Analysis Volume [veh/h]	0	148	244	3	9	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	7.73	0.00	0.00	0.00	10.98	9.63
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	1.12	1.12
d_A, Approach Delay [s/veh]	0.00		0.00		10.98	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.24					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Wilson Ave/South Project Dwy

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Wilson Ave		Wilson Ave			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wilson Ave		Wilson Ave			
Base Volume Input [veh/h]	0	129	207	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	4	22	3	8	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	133	229	3	8	5
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	35	60	1	2	1
Total Analysis Volume [veh/h]	2	140	241	3	8	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	7.73	0.00	0.00	0.00	10.95	9.63
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.06	0.06
95th-Percentile Queue Length [ft/ln]	0.11	0.11	0.00	0.00	1.47	1.47
d_A, Approach Delay [s/veh]	0.11		0.00		10.44	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.38					
Intersection LOS	B					

Vistro File: Z:\...\RiderNorth.vistro
Report File: Z:\...\Opening Year Plus Project PM_LOS.pdf
Scenario 8 8 Opening Year + Project PM
1/3/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Redlands Ave/Rider St	22	85	154	135	75	22	24	774	5	40	488	91	1915

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
2	Wilson Ave/Rider St	36	113	1007	16	181	559	1912

ID	Intersection Name	Northbound		Eastbound		Westbound		Total Volume
		Left	Right	Thru	Right	Left	Thru	
3	Project Dwy/Rider St	0	13	1057	5	0	618	1693

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
4	Wilson Ave/North Project Dwy	0	141	232	3	9	0	385

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Wilson Ave/South Project Dwy	2	133	229	3	8	5	380

Option 1: Traffic Signal

Number	2					
Intersection	Wilson Ave/Rider St					
Control Type	Signalized					
Analysis Method	HCM 6th Edition					
Name						
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Base Volume Input [veh/h]	27	101	861	0	169	482
Total Analysis Volume [veh/h]	29	105	1015	1	178	562

Intersection Settings

Cycle Length [s]	120					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fully actuated					
Lost time [s]	6.00					
Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	4	0	2	0	0	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	7	0	7	0	0	7
Maximum Green [s]	30	0	30	0	0	30
Amber [s]	3.0	0.0	3.0	0.0	0.0	3.0
All red [s]	1.0	0.0	1.0	0.0	0.0	1.0
Split [s]	83	0	37	0	0	37
Walk [s]	5	0	5	0	0	0
Pedestrian Clearance [s]	10	0	10	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
l1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	0.0	2.0
Minimum Recall	No		No			No
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Pedestrian Signal Group	0					
Pedestrian Walk [s]	0					
Pedestrian Clearance [s]	0					

Lane Group Calculations

g / C, Green / Cycle	0.13	0.69	0.69	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.09	0.60	0.00	0.36	0.18
so, Base Saturation Flow per Lane [pc/h/ln]	1900	1900	1900	1900	1900
Arrival type	3	3		3	
s, saturation flow rate [veh/h]	1465	1683	1431	500	3204
c, Capacity [veh/h]	193	1154	981	235	2197
X, volume / capacity	0.70	0.88	0.00	0.76	0.26
d, Delay for Lane Group [s/veh]	22.62	12.74	2.17	25.62	2.68
Lane Group LOS	C	B	A	C	A
Critical Lane Group	X	X			

Critical Lane Group	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	1.37	4.69	0.00	1.97	0.33
50th-Percentile Queue Length [ft/ln]	34.25	117.20	0.03	49.26	8.30
95th-Percentile Queue Length [veh/ln]	2.47	8.24	0.00	3.55	0.60
95th-Percentile Queue Length [ft/ln]	61.65	205.97	0.05	88.66	14.93

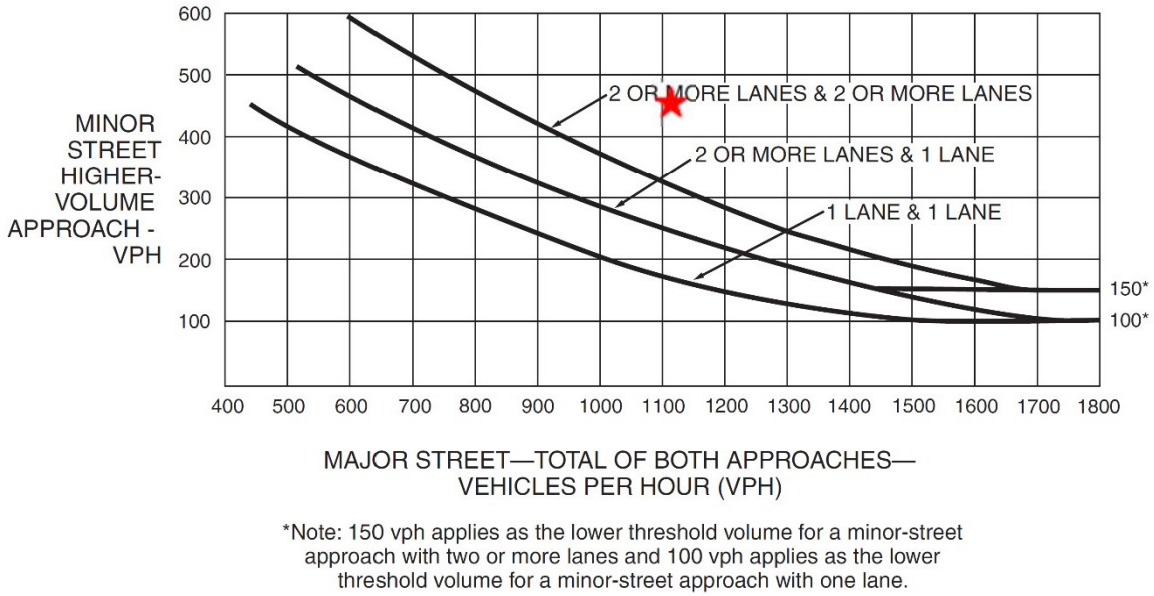
Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.62	22.62	12.74	2.17	25.62	2.68
Movement LOS	C	C	B	A	C	A
Critical Movement	No	No	No	No	Yes	No
d_A, Approach Delay [s/veh]	22.62		12.73		8.20	
Approach LOS	C		B		A	
d_I, Intersection Delay [s/veh]	11.66					
Intersection LOS	B					
Intersection V/C	0.805					

APPENDIX D – SIGNAL WARRANT ANALYSIS

Wilson Ave/Rider St
Existing AM Peak Hour
Minor Street Approach - 457 vehicles
Major Street (Both Approaches) – 1,109 vehicles
Meets Warrant - Yes

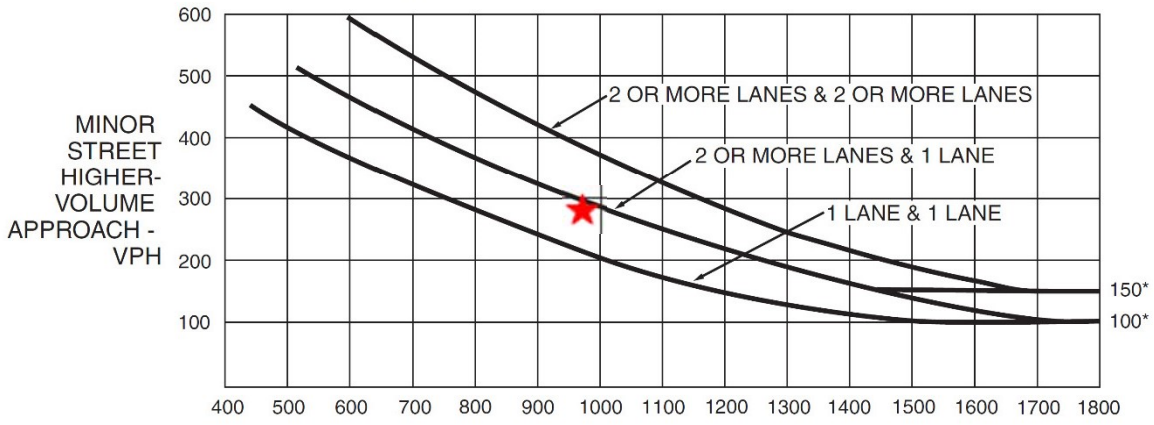
Figure 4C-3. Warrant 3, Peak Hour



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

Wilson Ave/Rider St
Existing PM Peak Hour
Minor Street Approach - 282 vehicles
Major Street (Both Approaches) – 983 vehicles
Meets Warrant - Yes

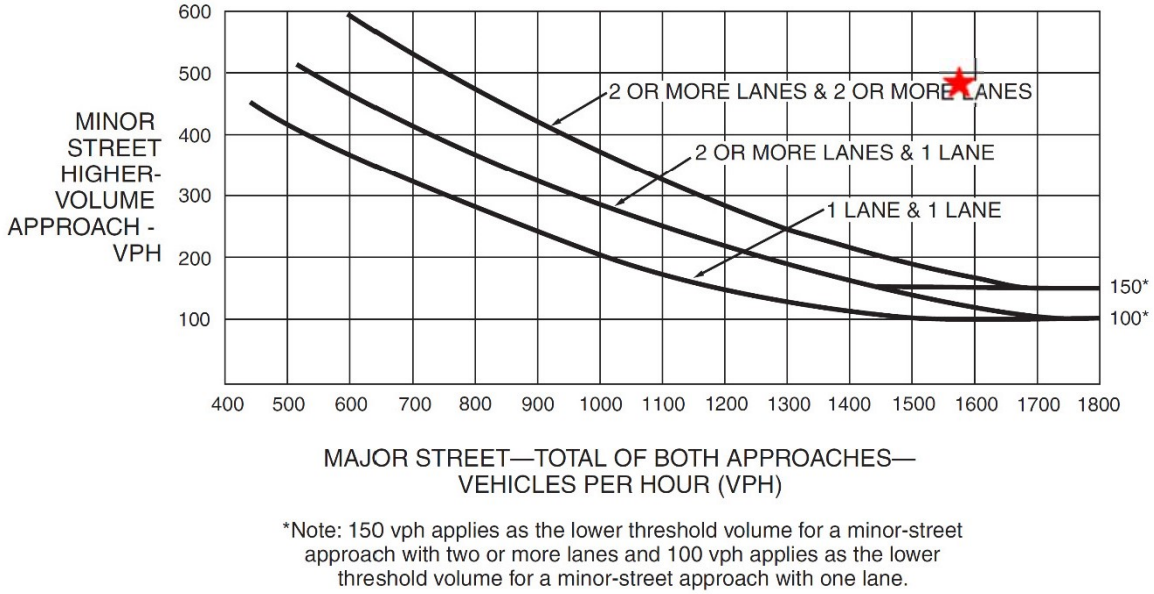
Figure 4C-3. Warrant 3, Peak Hour



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

Wilson Ave/Rider St
Opening Year AM Peak Hour
Minor Street Approach - 493 vehicles
Major Street (Both Approaches) – 1,581 vehicles
Meets Warrant - Yes

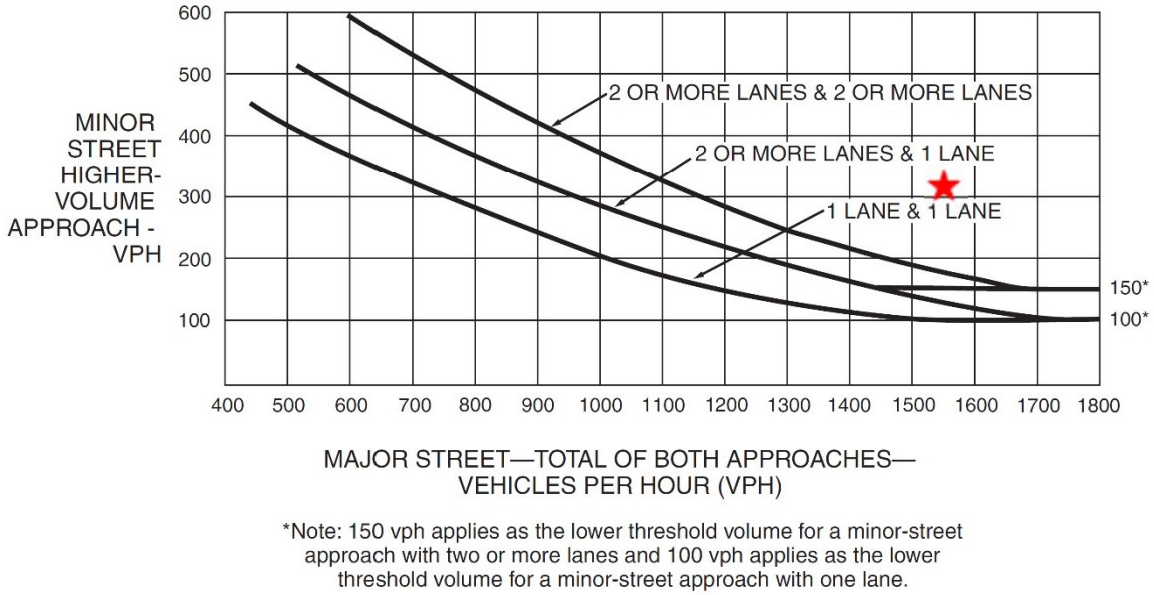
Figure 4C-3. Warrant 3, Peak Hour



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

Wilson Ave/Rider St
Opening Year PM Peak Hour
Minor Street Approach - 310 vehicles
Major Street (Both Approaches) – 1,566 vehicles
Meets Warrant - Yes

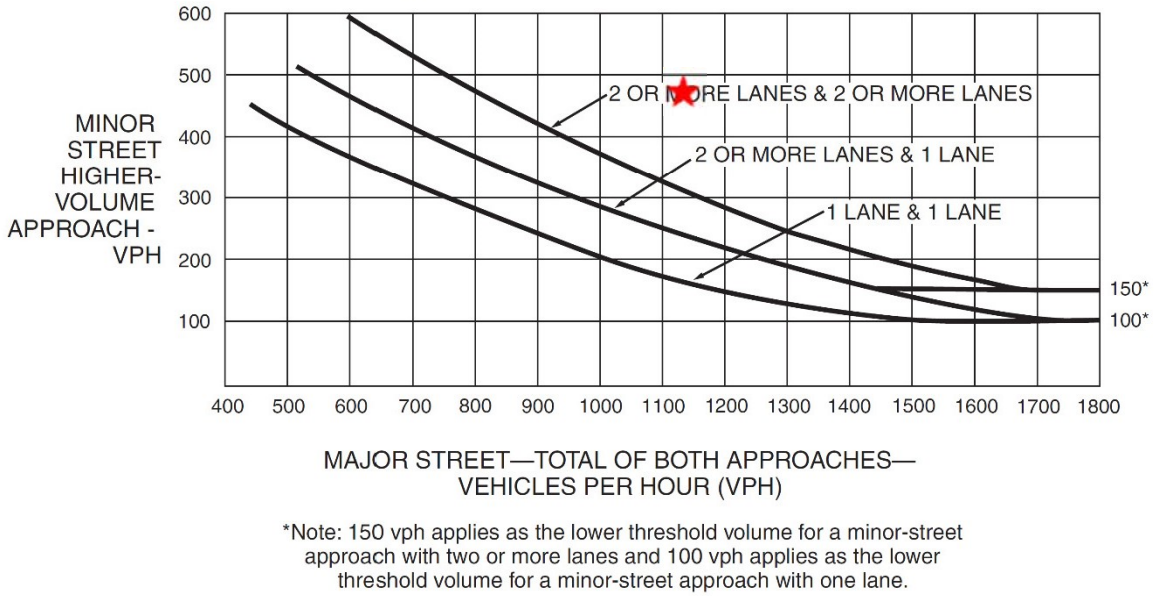
Figure 4C-3. Warrant 3, Peak Hour



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

Wilson Ave/Rider St
Existing Plus Project AM Peak Hour
Minor Street Approach - 460 vehicles
Major Street (Both Approaches) – 1,126 vehicles
Meets Warrant - Yes

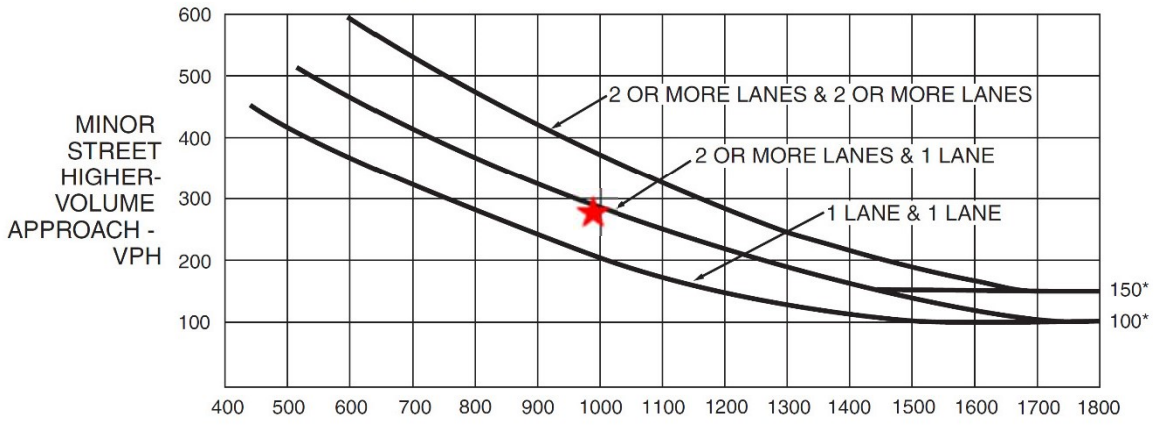
Figure 4C-3. Warrant 3, Peak Hour



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

Wilson Ave/Rider St
Existing Plus Project PM Peak Hour
Minor Street Approach - 291 vehicles
Major Street (Both Approaches) – 997 vehicles
Meets Warrant - Yes

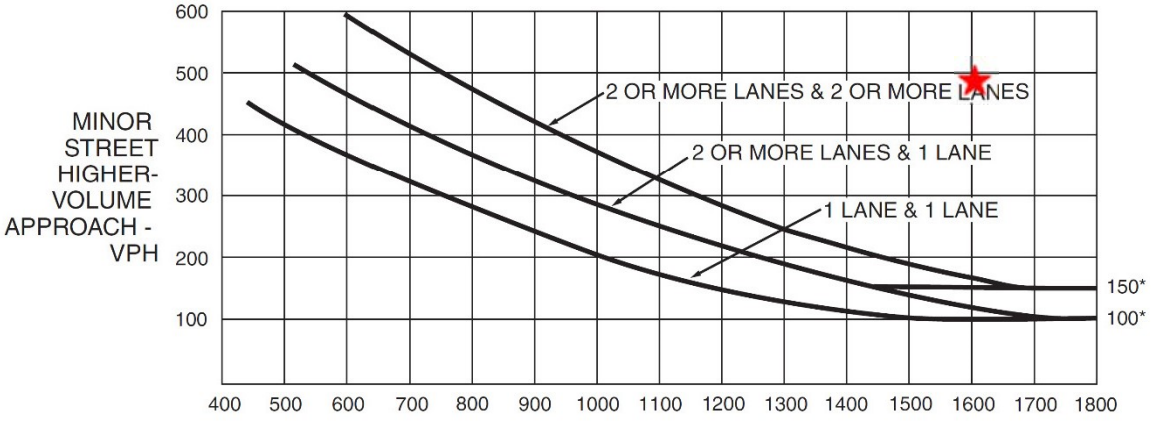
Figure 4C-3. Warrant 3, Peak Hour



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

Wilson Ave/Rider St
Opening Year Plus Project AM Peak Hour
Minor Street Approach - 497 vehicles
Major Street (Both Approaches) – 1,601 vehicles
Meets Warrant - Yes

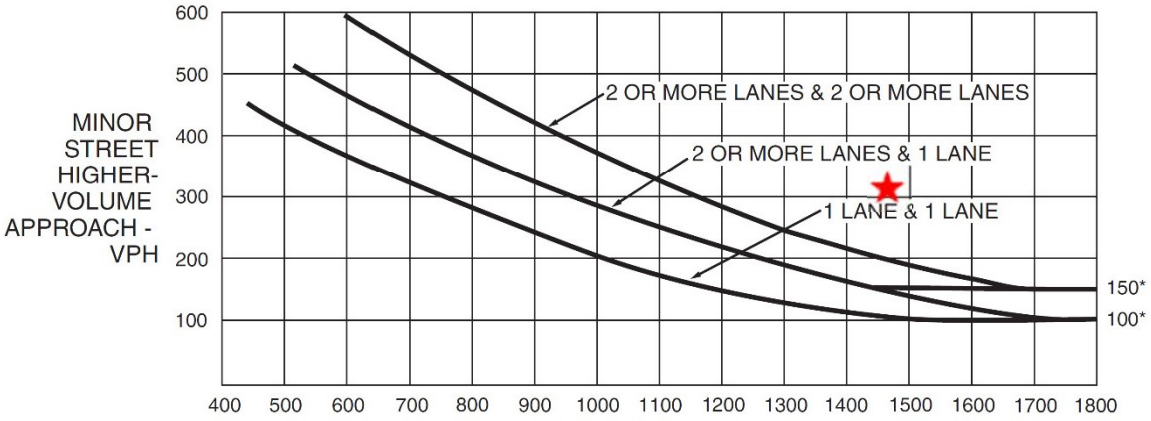
Figure 4C-3. Warrant 3, Peak Hour



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

Wilson Ave/Rider St
Opening Year Plus Project PM Peak Hour
Minor Street Approach - 312 vehicles
Major Street (Both Approaches) – 1,578 vehicles
Meets Warrant - Yes

Figure 4C-3. Warrant 3, Peak Hour



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