MEMO

TO: Brendan O'Reilly, Josi Kytle
FROM: Jonathan Slason, PE
DATE: November 28, 2016
SUBJECT: Richmond Creamery Traffic Impact Review

On behalf of Buttermilk LLC., RSG has conducted an analysis of traffic operations proximate to the proposed redevelopment of the former Richmond Creamery property off Jolina Court in Richmond, Vermont. This memorandum has been prepared to document the effects that the project may have on the local traffic conditions in downtown Richmond in connection with a local permit land use development application.

1.0 SUMMARY OF KEY FINDINGS

We offer the following summary of key findings based on the analysis presented in this memorandum:

- The project is located east of Bridge Street and south of US 2 in Richmond, Vermont. The project site will consist of multiple phases of redevelopment consisting generally of residential apartments (rental units) and a mix of non-residential uses including restaurant, retail, and general office space.
- Access to the site will be via Jolina Court off Bridge Street directly across from the Richmond Market on Railroad Street.
- The first phase of the site redevelopment is expected to generate 9 AM peak hour trips and 13 PM peak hour trips.
- The full build of the site (phases 1, 2, & 3) is more speculative but, given the estimated land uses, is expected to generate 53 AM peak hour trips and 57 PM peak hour trips.
- Minor delays and LOS B for vehicles exiting the site via Jolina Court and LOS C for vehicles exiting Railroad Street across from the site access, and negligible delays and LOS A for traffic along Bridge Street are anticipated with the addition of site related traffic.
- The site is expected to generate fewer than the VTrans study area standard 75 peak hour vehicle trips. The Town of Richmond asked to review the impacts of the site related traffic at the nearby US 2 / Bridge Street intersection. It is expected that the LOS will remain unchanged with the addition of the site traffic which operates at LOS D, higher than the targeted operational threshold set by the VTrans LOS policy.. There is expected to be a slight increase in overall delay at the signalized intersection in the PM peak hour.
- There are two high crash locations in the study area. There were no direct patterns or crash type which would be exacerbated by the additional traffic due to the project. The primary crash type of rear ends will likely remain to be the predominate type, related to the long

RSG 180 Battery Street, Suite 350, Burlington, Vermont 05401 www.rsginc.com

queues related to the signalized intersection and the number of points of conflict and activity in the study area associated with driveways, on-street parking, railway crossings, and the overall level of traffic.

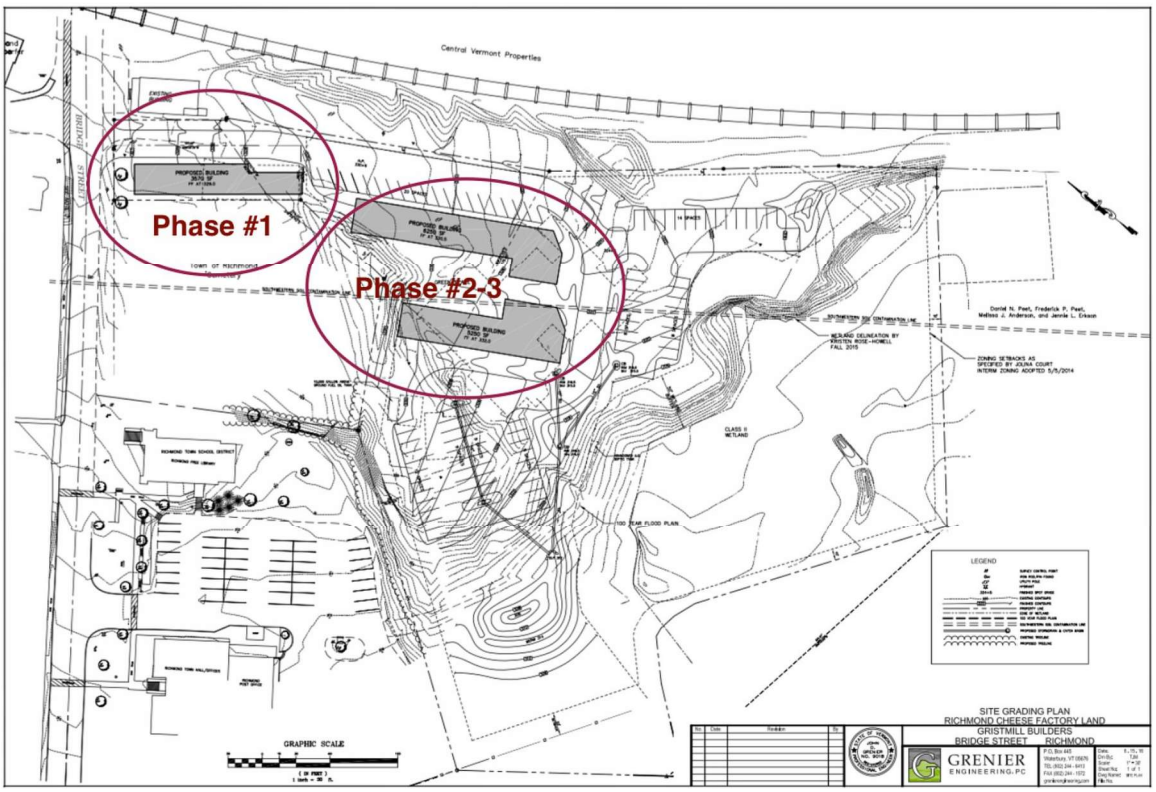
- The proposed site access should upgrade the Jolina Court intersection with Bridge Street to include curbing, sidewalks, and crosswalks in keeping with the Bicycle and Pedestrian study completed in 2010.
- Dedicated turning lanes into Railroad Street or Jolina Court are not warranted.
- Based on the analysis presented above we project that redevelopment of the Richmond Creamery, as proposed, will not cause unreasonable congestion or unsafe conditions on the local roadway network and will not adversely impact the public investment in roadway infrastructure in the adjacent area.

2.0 PROJECT DESCRIPTION

This study evaluates the traffic impacts associated with the proposed redevelopment of the Richmond Creamery property in downtown Richmond, Vermont.

As shown in the site plan below, the proposed project will consist of two primary development phases, made up of three buildings. Access will be via Jolina Court along the northern edge of the property. This traffic analysis assesses the impact of phase 1 and completion of the project (phases 1, 2, and 3). For the purposes of providing the Town an initial estimate of the projects impact an assumed mix of uses was used for phases 2 and 3. It is noted that these uses and the final configuration of phases 2 and 3 are highly speculative and will likely change. Only phase 1 is being permitted at this point.

FIGURE 1: PRELIMINARY PROJECT SITE PLAN



- Phase 1 involves;
  - One building with 9,825 s.f. gross leasable floor area on 4 floors.
  - Eight apartments (dwelling units) and 6,410 s.f. of commercial space.
  - For the purpose of this study we will assume a mix of commercial space use, as follows:
    - Specialty Retail: 3,610 s.f.
    - General Office Space: 2,800 s.f.
- Phases 2 and 3 involve:
  - Two additional buildings with 43,700 total s.f. gross leasable floor area. Each building will have 4 floors.

- 13 apartments and 29,250 s.f. of commercial space.
- For the purpose of this study we will assume a mix of commercial space use, as follows:
    - High turnover Sit-down Restaurant: 1,500 s.f.
    - Quality Restaurant: 1,500 s.f.
    - Specialty Retail: 4,500 s.f.
    - General Office Space: 21,750 s.f.

For reference and comparison, local examples of the types of restaurants are well represented by Chef's Table ("quality") and Hachet ("high turnover"). The main difference is whether they serve breakfast or not, and the turnover is a little slower / less frequent for the quality restaurant in the evening.

This study relies upon design standards and analysis procedures documented in the 2010 Highway Capacity Manual,[1] Trip Generation,[2] A Policy on Geometric Design of Highways and Streets,[3] Manual on Uniform Traffic Control Devices (MUTCD),[4] Traffic Impact Evaluation: Study and Review Guide,[5] and the Vermont State Design Standards,[6] which are the generally accepted traffic analysis references relied upon by traffic engineering professionals and VTrans for projects of this type in Vermont.

VTrans guidelines specify that a traffic study should be considered if the proposed development will generate 75 or more peak hour trips. The geographic scope of the study should also include the immediate access points and those intersections or highway segments receiving 75 or more project-generated peak hour trips.[7]

Although we do not anticipate that the project will generate more than 75 vehicle trips during the peak hour the Town has asked that the two intersections: Jolina Court / Bridge Street and the US 2 / Bridge Street are analyzed in this study.

3.0 LOCAL TRAFFIC

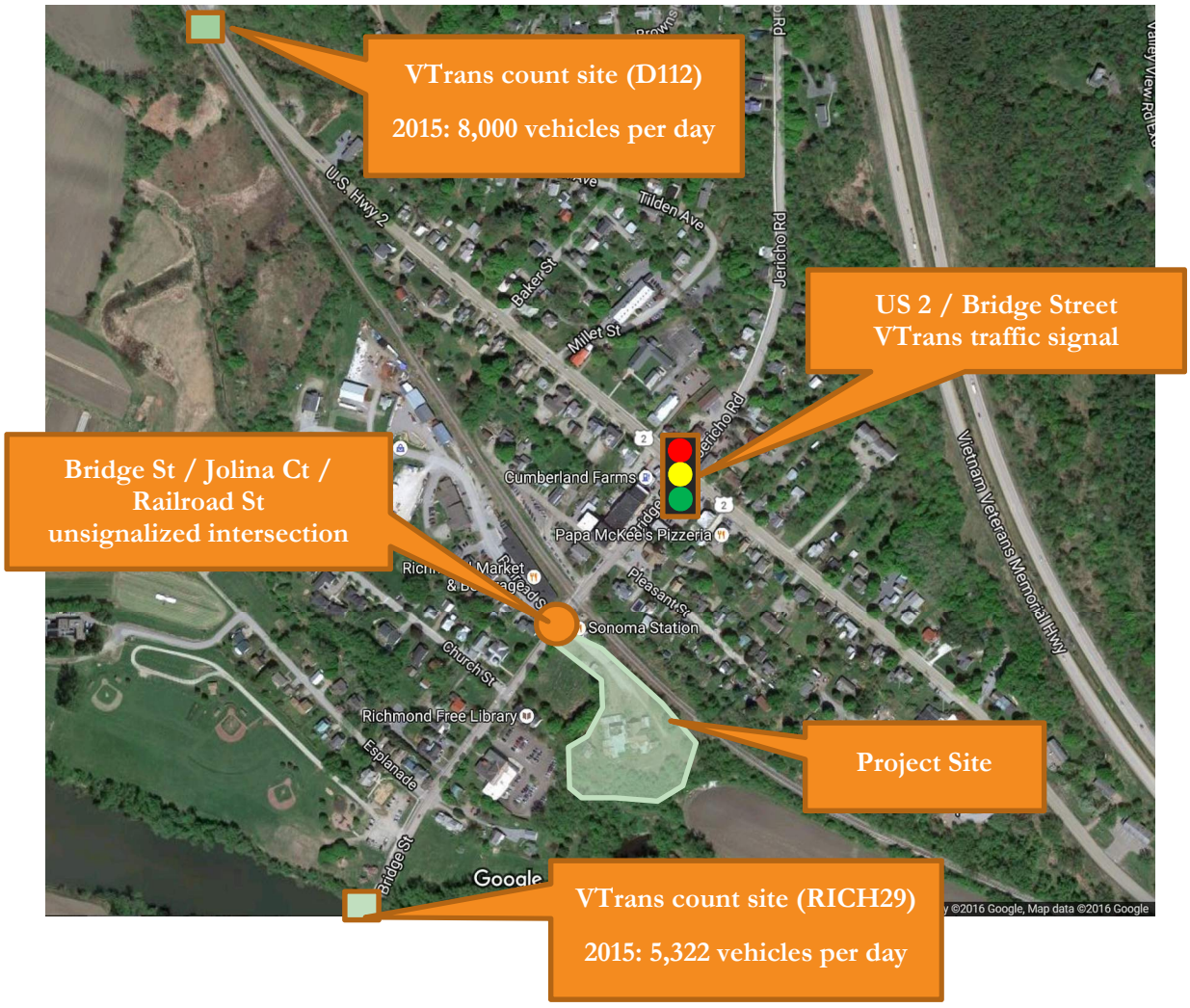
The section of Bridge Street proximate to the proposed site is a two-lane roadway (one lane in each direction) with a posted speed limit of 25 miles per hour. In 2015, VTrans recorded an annual average daily traffic volume (AADT) of 8,000 vehicles per day along US 2 at station S6D112, approximately 0.8 miles west of the US 2 / Bridge Street intersection. A second count site (RICH29)

[1] Transportation Research Board, National Research Council, *Highway Capacity Manual* (Washington, DC: National Academy of Sciences, 2010).
[2] Institute of Transportation Engineers, *Trip Generation* 9th Edition (Washington, D.C.: Institute of Transportation Engineers, 2012).
[3] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th Edition (Washington DC: AASHTO, 2011).
[4] American Traffic Safety Services Association (ATSSA), ITE, and AASHTO, *Manual on Uniform Traffic Control Devices*, 2009 Edition (Washington DC: FHWA, 2009).
[5] Vermont Agency of Transportation, Development Review Section, *Traffic Impact Evaluation Study and Review Guide* (October 2008).
[6] State of Vermont Agency of Transportation, *Vermont State Standards* (Montpelier: VTrans, 1 July 1997).
[7] Vermont Agency of Transportation, Development Review Section, *Traffic Impact Evaluation Study and Review Guide* (January 2003).

on Richmond Road was used to develop the adjustments at the Jolina Court site entrance. This site is located just south of the Winooski River bridge and had an AADT of 5,322 in 2015.

Count data collected by VTrans in 2015 indicate the highest traffic volumes along US 2 occur during the weekday AM and PM peak hours. Traffic impacts during the two time periods are examined in this study.

FIGURE 2: PROJECT LOCATION AND STUDY AREA INTERSECTIONS



4.0 ANALYSIS TRAFFIC VOLUMES

This analysis examines design hour vehicle delays and queues at the following two intersections:

1. US 2 / Bridge Street
2. Bridge Street / Jolina Court / Railroad Street

Vehicle delays and queues are examined first with baseline, **No Build** scenario, traffic volumes, which represent the anticipated design hour conditions in the target study years without the proposed development in place.

Once baseline conditions are established, anticipated traffic associated with the proposed development is added to the No Build scenario volumes to create **Build** scenario traffic volumes, which are in turn used to project intersection delays and levels of service with the proposed development in place.

A detailed description of the elements that contribute to the No Build and Build scenario traffic volumes is presented below.

4.2 | BACKGROUND TRAFFIC VOLUMES AND ADJUSTMENTS

RSG obtained the most recent VTrans turning movement count data at the US 2 / Bridge Street intersection (counted on June 25th and 26th 2015 by VTrans). Additional count data was collected by RSG for the Bridge Street / Jolina Court / Railroad Street intersection on November 10, 2016.

Following VTrans traffic study guidelines, raw peak hour traffic volumes were adjusted to represent the design hour volume (DHV)[8] in 2017 and 2022[9] using two adjustment factors:

1. Design hour adjustment factor for the US 2 / Bridge Street intersection is based on VTrans count station S6D112, which is located along US 2 in Richmond 0.80 miles west of the Bridge Street intersection. The 2015 DHV at this station was compared to the peak hour volumes on the date of the turning movement count to formulate DHV adjustments. DHV adjustments increased raw count volumes by 9%. The Jolina Court design hour adjustment factor is based on the VTrans count station Richmond29, just south of the Winooski River bridge. The 2015 DHV factor was taken from the VTrans Rural Primary and Secondary adjustment classification. The DHV adjustment increased raw count volumes by 1%.
2. An annual adjustment factor, which represents general background traffic growth, is based on historic count data at VTrans count station S6D112. Traffic volumes on US 2 have historically been higher or at least as high as they currently are. The 20-year projection included in the VTrans Red Book indicate a flat, zero growth rate.

4.3 | OTHER DEVELOPMENT VOLUMES

Other development volumes (ODVs) represent trips generated by anticipated developments in the study area. Trips generated by ODVs are included in every scenario (both No Build and Build) because we assume they are already present on the road network in the analysis years.

Through discussion with the Town of Richmond there were no ODVs included in this assessment.

4.4 | TRIP GENERATION

Trip generation refers to the number of new vehicle trips originating at or destined for a particular development. Traffic generated by redeveloped the Creamery site will primarily consist of new residents and store patrons who may stop at the store while driving by or who may make entirely

[8] The DHV is the 30th highest hour of traffic for the year and is used as the design standard in Vermont.
[9] VTrans requires analysis during the year project construction is expected to be complete and in a future year scenario 5 years after project completion. Due to Zero growth rate, the 2022 Build is the same as 2017 and therefore excluded from a separate analysis.

new vehicle trips to the store. New vehicle trips include all users to the site including employees, deliveries and other incidental users.

To estimate the number of new vehicle trips for the project, we examined trip generation rates presented in the Institute of Transportation Engineer's *Trip Generation Manual*.[10] Applying trip generation rates for the ITE land use codes shown below in the table for phase 1 and the full build.

The mix of land uses is an excellent array of both generators and attractors of trips and therefore lends itself to capture a portion of trips internally to the project site. The most recent ITE guidance to estimate the amount of internal trip making within the site comes from the NCHRP 684 research document. For example, a resident may work at an office at the site. Or a resident may be one of the restaurant patrons. The mix of residential, office, and retail/restaurant allow a portion of each use on its own to attract trips originating from other land uses on site. Overall, this internal capture of trips results in a reduction in trips exiting and entering the project site.

Site generated traffic can be differentiated between primary and pass-by trips. While primary trips represent people who leave their home, place of work, or other origin expressly to visit the site and who would not otherwise have gotten into their vehicle to make a trip, pass-by trips represent vehicles that currently pass by the site on the local road network and who, when the proposed development is present, turn into the site on their way to another destination. Pass-by trips are converted from through movements to turning movements to and from the site at the development access points but do not add new trips to intersections beyond the site access. We expect that the retail and the restaurant land uses will have a pass-by percentage of trips, 34% and 43% respectively.

Figure 3 presents the projected phase 1 trip generation, broken out into primary and pass-by traffic.

FIGURE 3: TRIP GENERATION SUMMARY – PHASE 1

		Projected Trip Generation			
		AM		PM	
Land Use	Size	Enter	Exit	Enter	Exit
Residential Condominium/Townhouse	8 units	1	3	3	1
General Office Building	2,800 sq ft	4	1	1	3
Specialty Retail Center	3,610 sq ft	0	0	4	5
Total		5	4	8	9
Internal Capture		0	0	1	1
External Trips		5	4	7	8
Retail Pass-By	34%	0	0	1	1
Total Primary		5	4	6	7

Phase 1 of the development is expected to generate 9 primary (new) trips during the AM peak hour and 13 primary (new) trips during the PM peak hour after accounting for internal capture and pass-by trips.

[10] Institute of Transportation Engineers, Trip Generation 9th Edition (Washington, D.C.: Institute of Transportation Engineers, 2012).

FIGURE 4 - DISTRIBUTION OF SITE-GENERATED TRIPS – PHASE 1 BUILD

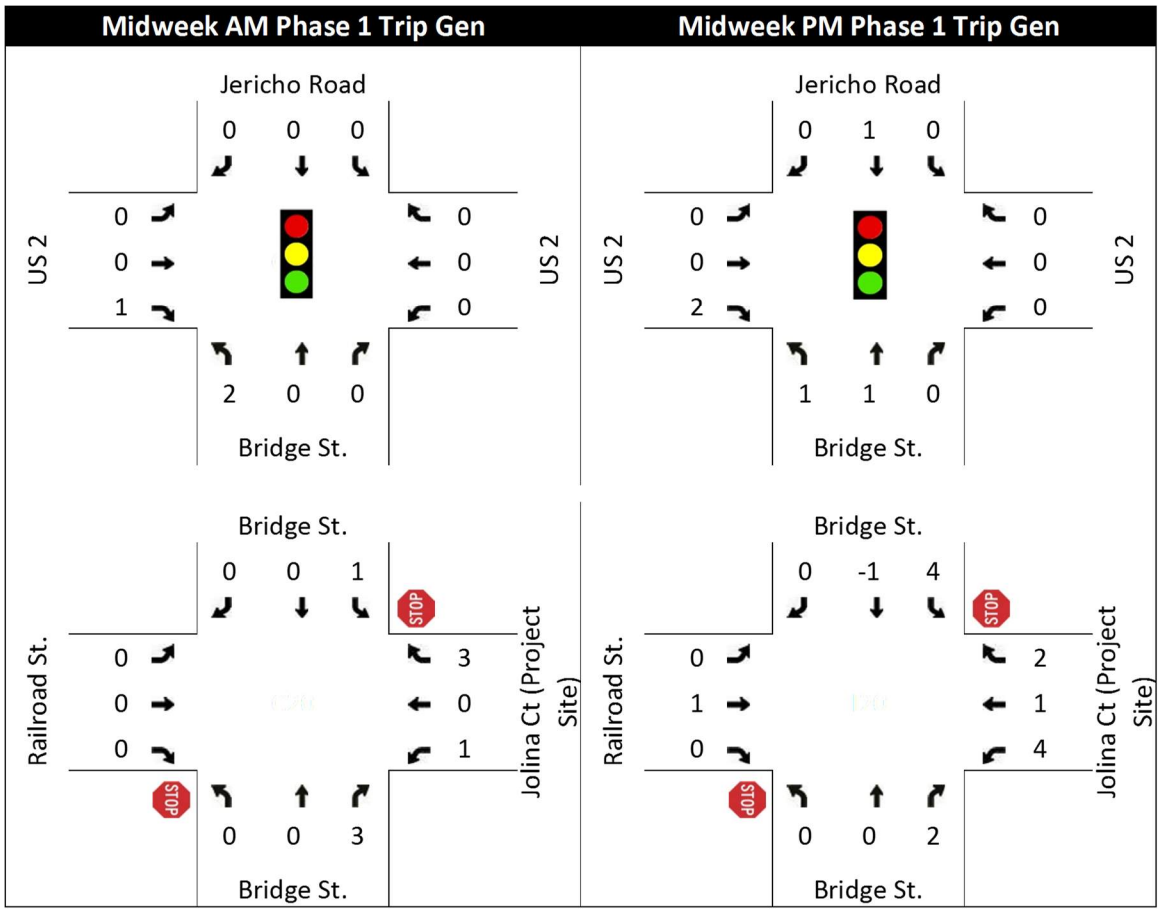


Figure 5 presents the projected full build trip generation, broken out into primary and pass-by traffic.

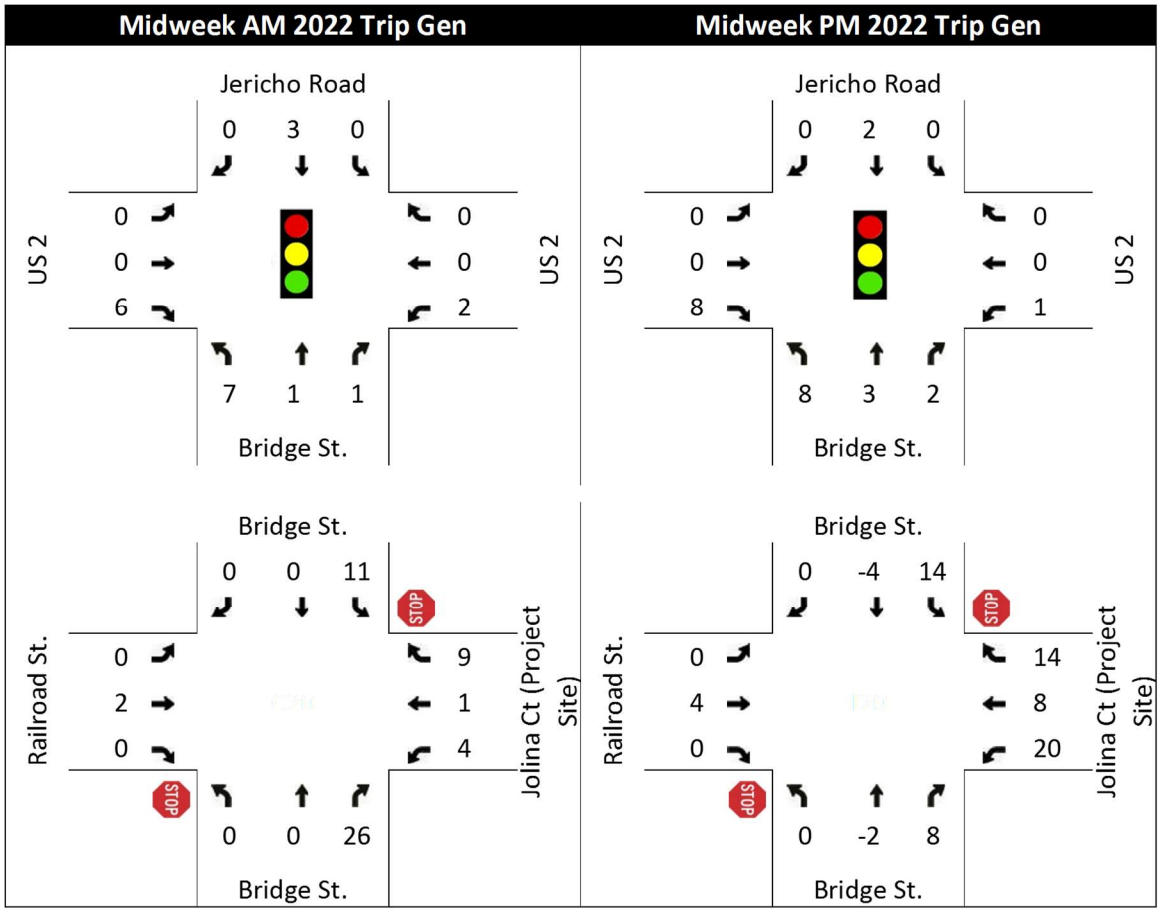
FIGURE 5: TRIP GENERATION SUMMARY – FULL BUILD

		Projected Trip Generation			
		AM		PM	
Land Use	Size	Enter	Exit	Enter	Exit
Residential Condominium/Townhouse	8 units	1	3	3	1
Apartment	13 units	1	5	5	3
Quality Restaurant	1,500 sq ft	0	0	7	4
High-Turnover (Sit-Down) Restaurant	1,500 sq ft	9	7	9	6
General Office Building	24,550 sq ft	34	5	6	30
Specialty Retail Center	8,110 sq ft	0	0	6	8
Total		45	20	36	52
Internal Capture		6	6	10	10
External Trips		39	14	26	42
Retail Pass-By	34%	0	0	1	1
Restaurant Pass-By	43%	0	0	6	3
Total Pass-By		0	0	7	4
Total Primary		39	14	19	38

Full build at the site (phases 1, 2, and 3) of the development is expected to generate 53 primary (new) trips during the AM peak hour and 57 primary (new) trips during the PM peak hour after accounting for internal capture and pass-by trips.

Figure 6 presents a map of the estimated distribution of project-generated trips in the full build scenario.

FIGURE 6: DISTRIBUTION OF SITE-GENERATED TRIPS – FULL BUILD



4.5 | SCENARIO VOLUME GRAPHICS

Figure 7 through Figure 10 present the No Build and Build scenario traffic volumes at the two study area intersections. No Build traffic volumes include the raw count volumes and adjusted to design hour conditions. Build scenario volumes include the addition of project-generated traffic (both primary and pass-by trips) to the No Build traffic volumes.

With the addition of site-generated traffic, volumes entering and exiting the project site increase in the Build scenario and these trips are carried out through the neighboring intersections. Sometimes due to rounding the intersection volumes shown above may be off by one vehicle.

FIGURE 7: 2017 PEAK HOUR NO BUILD

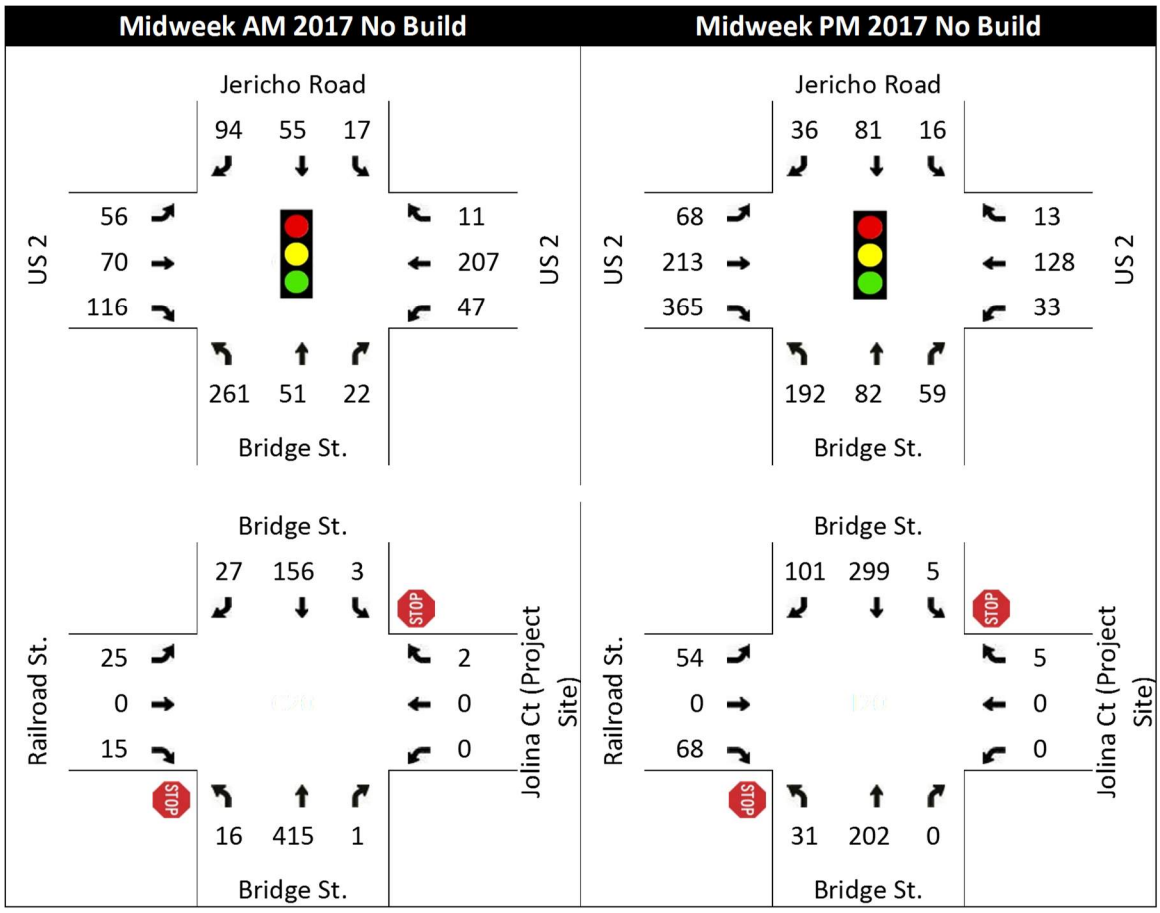


FIGURE 8: 2017 PEAK HOUR BUILD (PHASE 1)

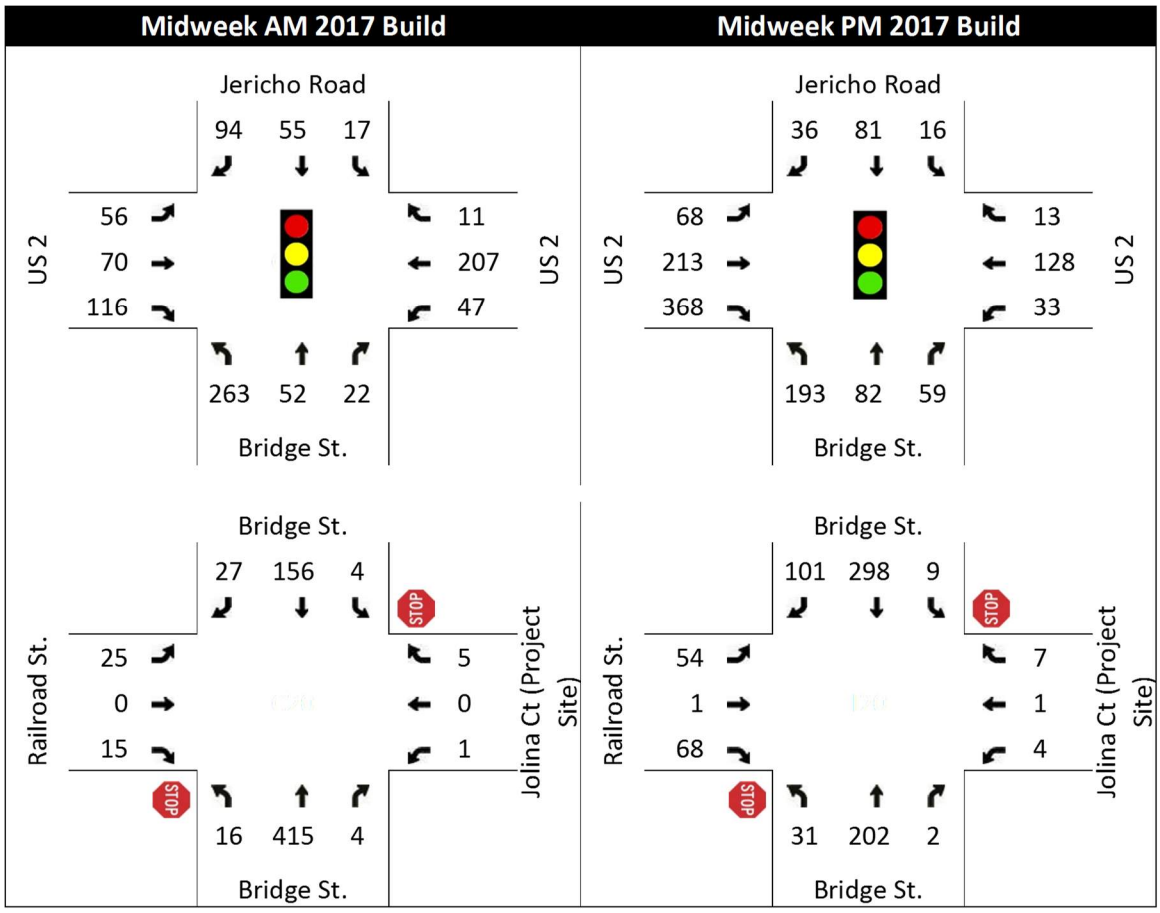


FIGURE 9: 2022 PEAK HOUR NO BUILD (INCLUDES PHASE 1 TRAFFIC)

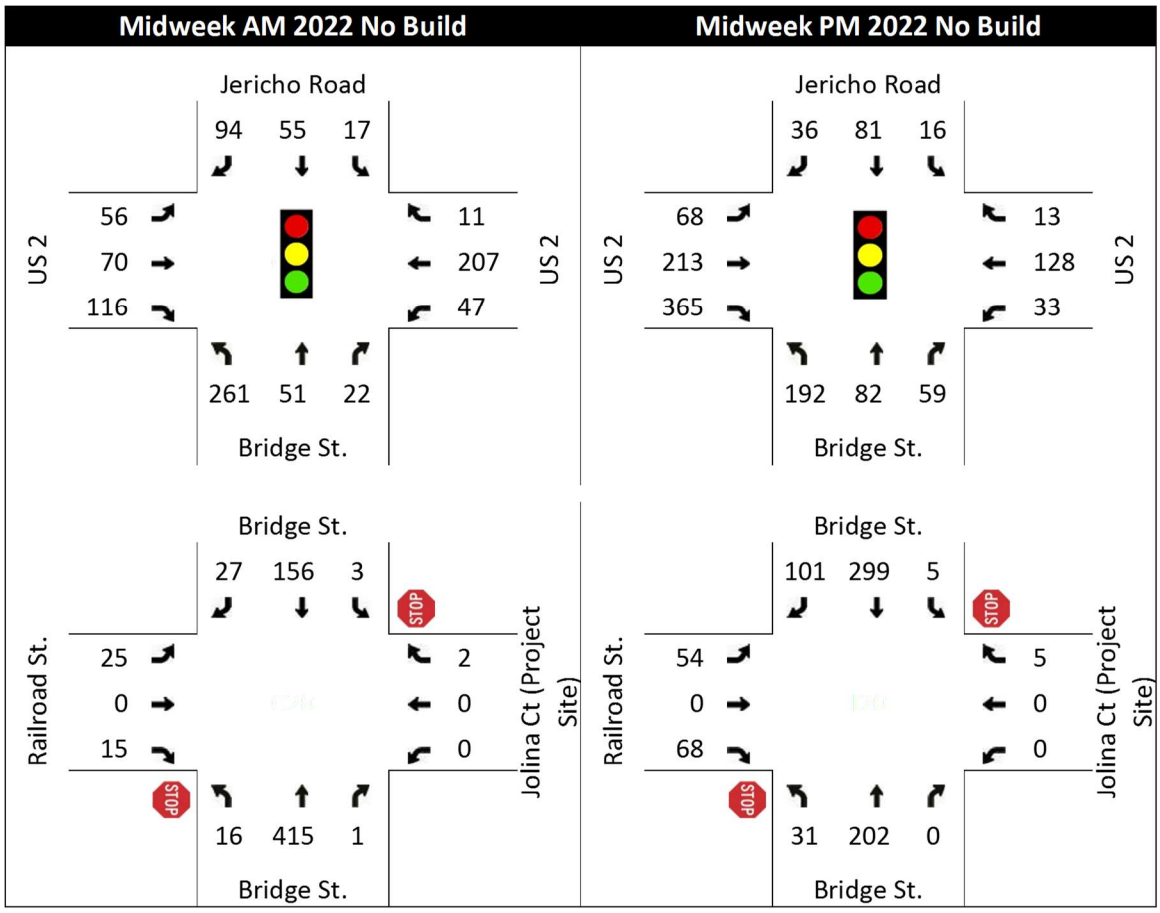
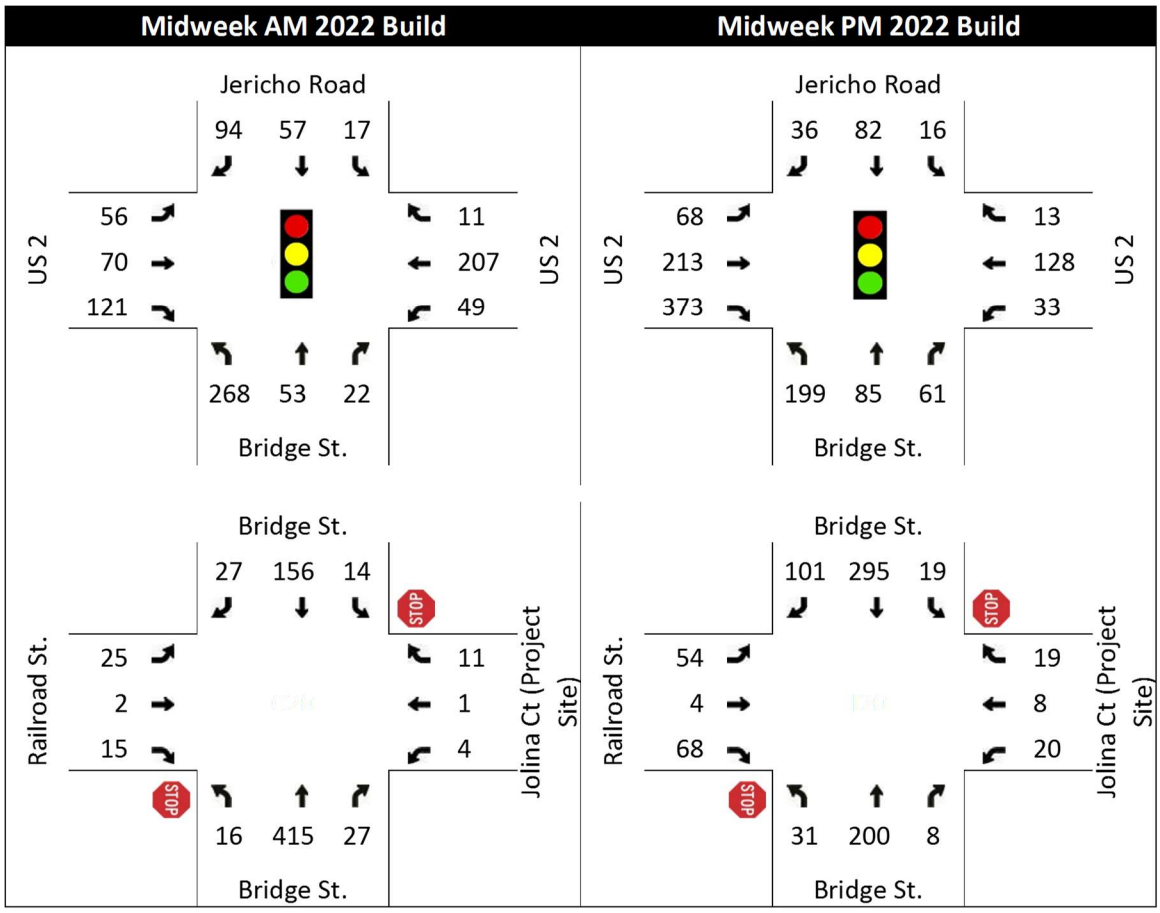


FIGURE 10: 2022 PEAK HOUR BUILD (PHASES 1, 2 AND 3)



The project analysis volumes and adjustments are included in Appendix A.

5.0 CONGESTION ANALYSIS

5.1 | LEVEL-OF-SERVICE DEFINITION

Level-of-service (LOS) is a qualitative measure describing the operating conditions as perceived by motorists driving in a traffic stream. LOS is calculated using the procedures outlined in the 2000 and 2010 Highway Capacity Manuals.[11] In addition to traffic volumes, key inputs include the number of lanes at each intersection, traffic control type (signalized or unsignalized), and the traffic signal timing plans.

The 2010 Highway Capacity Manual defines six qualitative grades to describe the level of service at an intersection. Level-of-Service is based on the average control delay per vehicle. Figure 11 shows the various LOS grades and descriptions for signalized and unsignalized intersections.

FIGURE 11: LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS

LOS	CHARACTERISTICS	UNSIGNALIZED TOTAL DELAY (SEC)	SIGNALIZED TOTAL DELAY (SEC)
A	Little or no delay	≤ 10.0	≤ 10.0
B	Short delays	10.1-15.0	10.1-20.0
C	Average delays	15.1-25.0	20.1-35.0
D	Long delays	25.1-35.0	35.1-55.0
E	Very long delays	35.1-50.0	55.1-80.0
F	Extreme delays	> 50.0	> 80.0

The delay thresholds for LOS at signalized and unsignalized intersections differ because of the driver's expectations of the operating efficiency for the respective traffic control conditions. According to HCM procedures, an overall LOS cannot be calculated for two-way stop-controlled intersections because not all movements experience delay. In signalized and all-way stop-controlled intersections, all movements experience delay and an overall LOS can be calculated.

The VTrans policy on level of service for **Signalized Intersections** is:

- Overall LOS C should be maintained for state-maintained highways and other streets accessing the state's facilities
- Reduced LOS may be acceptable on a case-by-case basis when considering, at minimum, current and future traffic volumes, delays, volume to capacity ratios, crash rates, and negative impacts as a result of improvement necessary to achieve LOS C.

[11] The HCM 2010 does not provide methodologies for calculating intersection delays at certain intersection types including signalized intersections with exclusive pedestrian phases and signalized intersections with non NEMA-standard phasing. Because of these limitations, HCM 2000 methodologies are employed where necessary.

The VTrans policy on level of service for **Two-Way and One-Way Stop Intersections** is:

- LOS D should be maintained for side roads with volumes exceeding 100 vehicles/hour for a single lane approach (150 vehicles/hour for a two-lane approach) at two-way stop-controlled intersections. The LOS D criteria for the single lane approach is in effect for Jolina Court.

5.2 | LEVEL-OF-SERVICE RESULTS

The Highway Capacity Manual congestion reports within Synchro (v9), a traffic analysis software package from Trafficware, routinely relied upon by transportation engineering professionals, were used to assess traffic congestion at the study intersections.

The US 2 / Bridge Street intersection shows an increase in delay with the addition of project site traffic, although there is no change in LOS. The PM peak hour conditions exceed the target identified by the VTrans LOS policy noted earlier in the No Build scenario.

The project site drive at Jolina Court at Bridge Street is expected to increase delay and change LOS from A to LOS B with the addition of the project site traffic in the PM peak hour. The unsignalized, side-street stop controlled intersection is expected to operate under acceptable LOS conditions with the addition of project traffic.

Figure 12 and Figure 13 present the LOS results during the weekday AM and PM peak hours at the US 2 / Bridge Street and at the Bridget Street / Jolina Court project entrance, respectively.

FIGURE 12: US 2 / BRIDGE STREET INTERSECTION LOS

US 2 / Bridge Street - HCM 2000 Signalized (overall)				
Scenario	AM	Delay (sec/veh)	PM	Delay (sec/veh)
2017-2022 No Build	B	18.1	D	41.0
2017 Build	B	18.2	D	43.4
2022 Build	B	18.5	D	50.6

FIGURE 13: PROJECT SITE DRIVE - BRIDGE ST / JOLINA CT SIDESTREET LOS

Project Site Drive - HCM 2010 TWSC (Approach Level of Service)				
Scenario	AM		PM	
	EB Railroad St.	*WB Jolina Ct.*	*EB Railroad St.*	*WB Jolina Ct.*
2017-2022 No Build	B	B	C	A
2017 Build	B	B	C	B
2022 Build	B	B	C	B

Detailed Synchro LOS worksheets are available in Appendix B.

5.3 | CRASH HISTORIES

Crash histories were collected from VTrans (January 2011-December 2015). VTrans maintains a statewide database of all reported crashes along all state highways and federal aid road segments.[12] Within this 5 year period, 49 crashes occurred within the study area stopping sight distance of the US 2 / Bridge Street intersection (US 2 mile marker 2.72) and the Jolina Court intersection along Bridge Street (Bridge Street mile marker 5.05). Among these 49 crashes, there were four injuries. 20 of the crashes were rear end crash types. Five of the crashes were single vehicle crashes. Three of the crashes were turning 'T-bone' broadside type crashes.

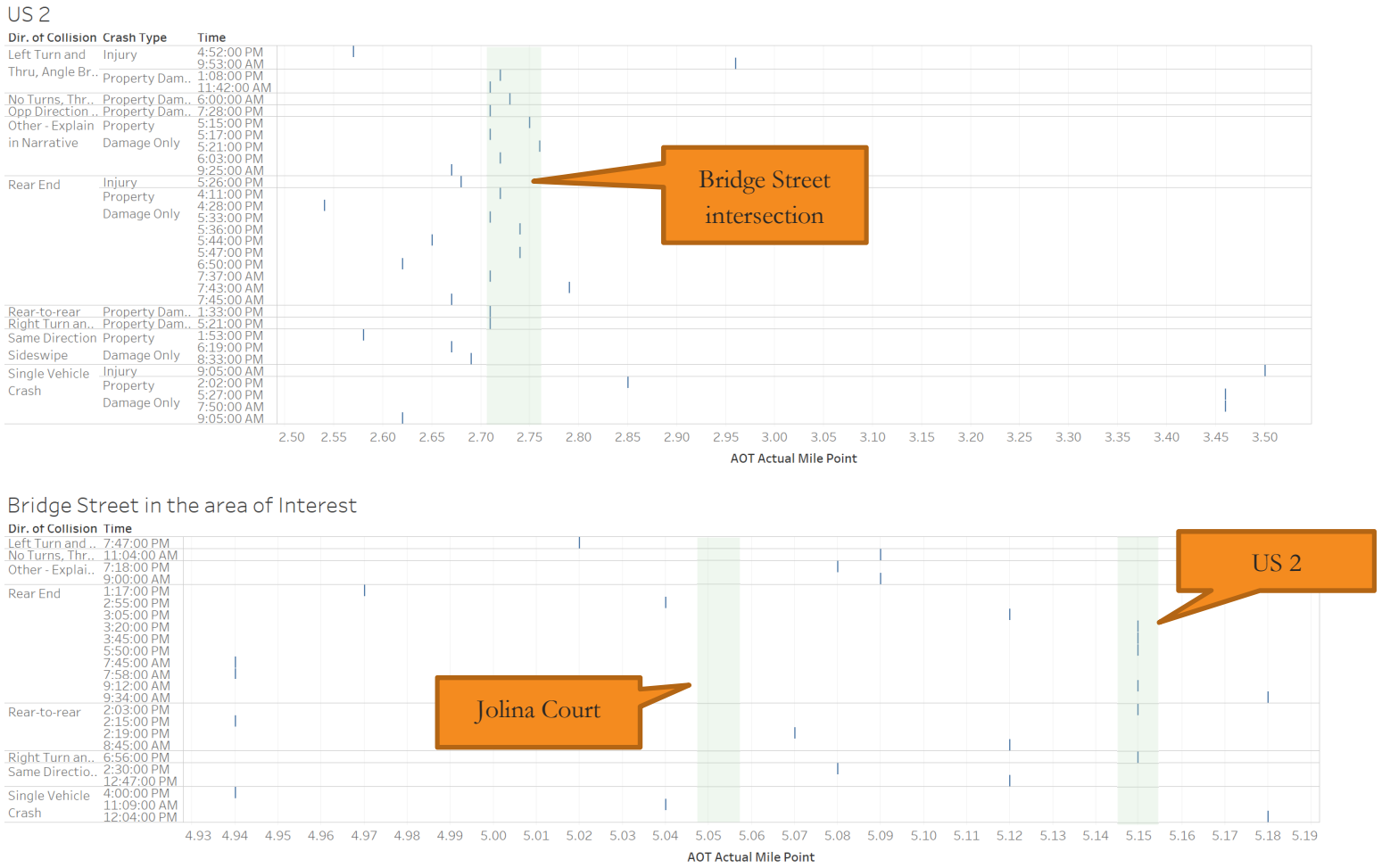
FIGURE 14: CRASH TYPES BY ROADWAY TYPE

Crash Type	Bridge Street	US 2
Left Turn and Thru, Angle Broadside -->v--		2
Left Turn and Thru, Same Direction Sideswipe/Angle Crash vv--	1	
No Turns, Thru moves only, Broadside ^<	1	1
Opp Direction Sideswipe		1
Other - Explain in Narrative	2	5
Rear End	10	10
Rear-to-rear	4	1
Right Turn and Thru, Angle Broadside -->^--		1
Right Turn and Thru, Same Direction Sideswipe/Angle Crash ^^--	1	
Same Direction Sideswipe	2	2
Single Vehicle Crash	3	2

As indicated in Figure 15, almost all crashes occurred during the afternoon and evening. This is when there is a greater overall level of activity within the study area, stores are open, and the afternoon commute home is the highest level of traffic volume.

[12] This data is exempt from Discovery or Admission under 23 U.S.C. 409.

FIGURE 15: US 2 & BRIDGE STREET CRASHES BY TYPE AND TIME OF DAY



The Vermont Agency of Transportation maintains a list of high crash locations (HCL), which are intersections and roadway segments that have high crash rates over five years compared to other intersections or segments with similar functional classification and traffic levels. The most recent report including the full years of 2010 to 2014 was used.

There are two high crash locations within the study area; a) at the US 2 / Bridge Street intersection, and b) along Bridge Street in the vicinity of the project entrance.

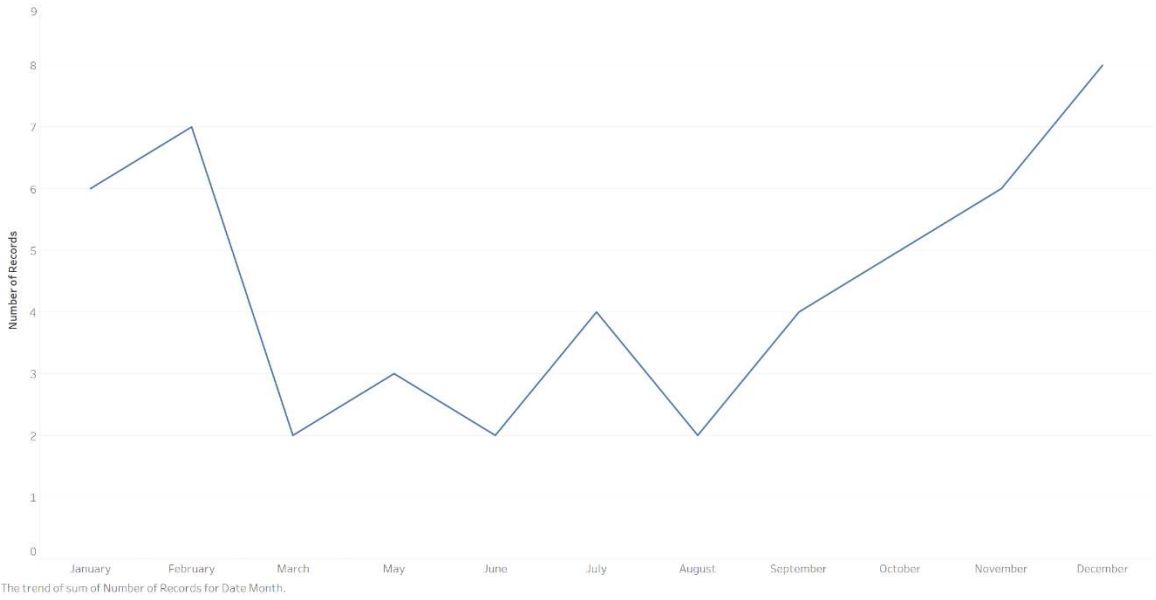
- The US 2 / Bridge Street intersection is ranked as the 10th highest actual to critical ratio (2.0) intersection in Vermont. Twenty-six crashes occurred with 1 injury.
- Bridge Street roadway segment from mile marker 4.770 – 5.070 is ranked 575th with an actual to critical ratio of 1.055. Eight crashes occurred with two injuries.

The review of the available crash data suggest that the crashes are likely related to the significant queuing and general level of background activity.

The project site entrance at Jolina Court is located within the Bridge Street high crash location and it appears that the majority of crashes occur during the PM period, which is the highest level of activity, but not the time period with longest queues and congestion (the AM peak).

Figure 16 shows a clear pattern of crashes occurring during the winter months within the study area.

FIGURE 16: CRASHES BY MONTH



The review of available crash data suggest that safety in the project study area would not be significantly impacted by the addition of project traffic.

6.0 TURN-LANE WARRANT ASSESSMENT

In assessing the proposed site access, we conducted a turn lane warrant analysis to determine if projected peak hour traffic volumes are sufficient to meet warrant thresholds for construction of a dedicated left-turn lane into the site. Dedicated left-turn lanes have the safety and capacity benefits of removing left-turning traffic from the through volume traffic stream but also promote higher vehicle speeds and require increased pavement widths.

Using the full build scenario volumes, we conducted a turn lane warrant analysis at the site entrance at Bridge Street / Jolina Court / Railroad Street intersection using both of the VTrans approved methodologies, Harmelink and Kikuchi and Chakroborty (1991).

Neither assessed method met the warrant criteria for either a turn lane into Railroad Street or into Jolina Court.

Figure 17 presents a summary of the northbound left-turn lane analysis.

FIGURE 17: LEFT-TURN LANE WARRANT ANALYSIS AT JOLINA COURT

2022 Full Build Volumes (Phases 1,2, and 3)

Northbound (to Railroad St)	AM Peak Hour	PM Peak Hour
Advancing Volume (V_A)	457	239
Opposing Volume (V_O)	198	415
% Left Turns	4%	13%
Warranted?	**No**	**No**

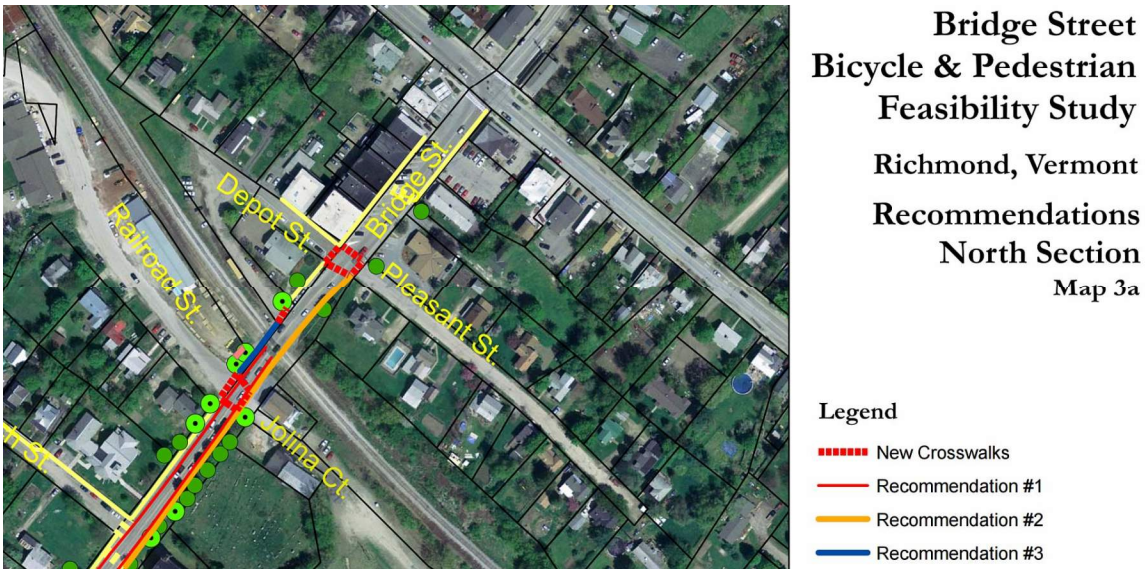
Southbound (to Jolina Ct)	AM Peak Hour	PM Peak Hour
Advancing (WB) Volume (V_A)	198	415
Opposing (EB) Volume (V_O)	457	239
% Left Turns	7%	5%
Warranted?	**No**	**No**

7.0 PEDESTRIAN FACILITIES

In the study area, sidewalks currently exist on the west side of Bridge Street. The 2010 Bridge Street Bicycle and Pedestrian Feasibility Study[13] outlined expectations for building a sidewalk network on the east side of Bridge Street which would connect Jolina Court to sidewalks to the south and north. The study also recommended crosswalks across Bridge Street at Jolina Court. The recommendations are shown in Figure 18.

[13] Bridge Street Bicycle & Pedestrian Feasibility Study, 26 April 2010. Broadreach Planning & Design

FIGURE 18: BICYCLE AND PEDESTRIAN STUDY RECOMMENDATIONS



The *Vermont Pedestrian and Bicycle Facility Planning and Design Manual* states that a 2-lane roadway with an AADT between 3,000 and 9,000 vehicles per day is a good candidate for a marked crosswalk.[14]

The improvements to the Bridge Street / Jolina Court intersection should include constructing the sidewalks and pedestrian crossing facilities in the project area. The future mix of uses at the project site supplement the existing mix of services, retail, and commercial in downtown Richmond. Supporting bicycle and pedestrian travel between all these uses will reduce vehicle traffic, support a livelily and vibrate town, and reduce the environmental impacts of the project.

8.0 CONCLUSIONS

The proposed redevelopment of the Richmond Creamery property in downtown Richmond, Vermont located southeast of the US 2 / Bridge Street intersection will be completed in phases. The first phase is expected to generate 9 AM peak hour trips and 13 PM peak hour trips on the adjacent highway network.

The future, more speculative phases 2 and 3, is comprised of two additional buildings and is expected to generate 53 AM peak hour trips and 57 PM peak hour trips on the adjacent highway network in the full build scenario.

With the addition of project related traffic to the site driveway intersection, we project minor delays and LOS B for vehicles exiting the site via Jolina Court and LOS C for vehicles exiting Railroad Street across from the site access, and negligible delays and LOS A for traffic along Bridge Street.

Although the site is expected to generate less than the 75 peak hour vehicle trips the Town of Richmond asked RSG to review the impacts of the site related traffic at the nearby US 2 / Bridge Street intersection. It is expected that the LOS will remain unchanged with the addition of the site

[14] Vermont Agency of Transportation, *Vermont Pedestrian and Bicycle Facility Planning and Design Manual* (Montpelier: VTrans, 2002) 3-41.

traffic, although there will be a slight increase in overall delay at the signalized intersection in the PM peak hour.

We have reviewed recent VTrans crash data and found that although there are two high crash locations in the study area there were no direct patterns or crash type which would be exacerbated by the additional traffic due to the project. The primary crash type of rear ends will likely remain to be the predominate type, related to the long queues related to the signalized intersection and the number of points of conflict and activity in the study area associated with driveways, on-street parking, railway crossings, and the overall level of traffic.

We have examined the proposed site access plan and when the Jolina Court is upgraded to provide the site access the intersection with Bridge Street should include curbing, sidewalks, and crosswalks in keeping with the Bicycle and Pedestrian study completed in 2010.

We have also conducted a turn-lane warrant analysis to determine if peak hour volumes might justify construction of a dedicated northbound left-turn lane into Railroad Street or a southbound left-turn lane into the project access. The traffic speeds and volumes are not to the magnitude which trigger further investigation and consideration and therefore no dedicated turn lanes are recommended at the Bridge Street / Jolina Court / Railroad Street intersection.

Based on the analysis presented above we project that redevelopment of the Richmond Creamery, as proposed, will not cause unreasonable congestion or unsafe conditions on the local roadway network and will not adversely impact the public investment in roadway infrastructure in the adjacent area.

11/29/16 04:23 PM

Raw Count Data

7:30-8:30

DHV & Annual Adjustments (3) to 2017

Apply Adjustments

1 = Apply Adjustment 1
2 = Apply Adjustment 2
3 = Apply Adjustment 3

Adjusted Raw Counts 2017

JERICHO RD & US-2		EB	WB	NB	SB	
01/00/00	L	51	43	239	16	
6/26/2015	T	64	190	47	50	
4th Friday	R	106	10	20	86	922
30411710	Enter	221	243	306	152	922
	Exit	100	515	108	199	922
	% Trucks					
	Peds	0	0	0	0	

Rural

1.09 *(From PM Peak)*

		EB	WB	NB	SB
	L	3	3	3	3
	T	3	3	3	3
	R	3	3	3	3

		EB	WB	NB	SB	
	L	56	47	261	17	
	T	70	207	51	55	
	R	116	11	22	94	1005
	Enter	241	265	334	166	1005
	Exit	109	562	118	217	1005

Bridge St/Railroad St/Jolina Ct		EB	WB	NB	SB	
Richmond	L	25	0	16	3	
11/10/2016	T	0	0	411	155	
2nd Thursday	R	15	2	1	27	655
2	Enter	40	2	428	185	655
	Exit	4	43	438	170	655
	% Trucks	5.0%	50.0%	3.0%	7.6%	
	Peds	9	0	0	0	

Rural

1.01 *(From PM Peak)*

		EB	WB	NB	SB
	L	3	3	3	3
	T	3	3	3	3
	R	3	3	3	3

		EB	WB	NB	SB	
	L	25	0	16	3	
	T	0	0	415	156	
	R	15	2	1	27	661
	Enter	40	2	432	187	661
	Exit	4	43	442	172	661

ODVs

None

	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

No Build

2017

	EB	WB	NB	SB	
L	56	47	261	17	
T	70	207	51	55	
R	116	11	22	94	1005
Enter	241	265	334	166	1005
Exit	109	562	118	217	1005

	EB	WB	NB	SB	
L	25	0	16	3	
T	0	0	415	156	
R	15	2	1	27	661
Enter	40	2	432	187	661
Exit	4	43	442	172	661

Trip Generation (Primary)

	Enter	Exit	
PM	5	4	9
	Phase 1		

	EB	WB	NB	SB	
L		0	2		
T			0	0	
R	1		0		4
Enter	1	0	3	0	4
Exit	0	2	0	1	4

	EB	WB	NB	SB	
L		1		1	
T	0	0			
R		3	3		9
Enter	0	4	3	1	9
Exit	5	0	3	1	9

Trip Generation (Pass by)

	Enter	Exit	
PM	0	0	0
	Phase 1		

	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

Build 2017

	EB	WB	NB	SB	
L	56	47	263	17	
T	70	207	52	55	
R	116	11	22	94	1009
Enter	242	265	336	166	1009
Exit	109	564	118	218	1009

	EB	WB	NB	SB	
L	25	1	16	4	
T	0	0	415	156	
R	15	5	4	27	670
Enter	41	6	435	188	670
Exit	9	44	445	173	670

Annual Adjustment 2022

1	n/a
2	n/a
3	1.00

1	n/a
2	n/a
3	1.00

Adjusted Raw Counts 2022

	EB	WB	NB	SB	
L	56	47	261	17	
T	70	207	51	55	
R	116	11	22	94	1005
Enter	241	265	334	166	1005
Exit	109	562	118	217	1005

	EB	WB	NB	SB	
L	25	0	16	3	
T	0	0	415	156	
R	15	2	1	27	661
Enter	40	2	432	187	661
Exit	4	43	442	172	661

No Build 2022

	EB	WB	NB	SB	
L	56	47	261	17	
T	70	207	51	55	
R	116	11	22	94	1005
Enter	241	265	334	166	1005
Exit	109	562	118	217	1005

	EB	WB	NB	SB	
L	25	0	16	3	
T	0	0	415	156	
R	15	2	1	27	661
Enter	40	2	432	187	661
Exit	4	43	442	172	661

Trip Generation (Primary)

	Enter	Exit	
PM	39	14	53

Phases 1+ 2

	EB	WB	NB	SB	
L		2	7		
T			1	3	
R	6		1		20
Enter	6	2	9	3	20
Exit	1	7	1	11	20

	EB	WB	NB	SB	
L		4		11	
T	2	1			
R		9	26		53
Enter	2	14	26	11	53
Exit	39	1	9	4	53

Trip Generation (Pass by)

	Enter	Exit	
PM	0	0	0

Phases 1+ 2

	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

Build 2022

	EB	WB	NB	SB	
L	56	49	268	17	
T	70	207	53	57	
R	121	11	22	94	1026
Enter	247	267	343	169	1026
Exit	110	569	119	228	1026

	EB	WB	NB	SB	
L	25	4	16	14	
T	2	1	415	156	
R	15	11	27	27	714
Enter	43	16	457	198	714
Exit	43	44	451	175	714

11/29/16 04:23 PM

Raw Count Data

DHV & Annual Adjustments (3) to 2017

Apply Adjustments

1 = Apply Adjustment 1
2 = Apply Adjustment 2
3 = Apply Adjustment 3

Adjusted Raw Counts 2017

ODVs Name of Development

16:15-17:15 DHV at S6D112 on US-2 in Richmond 1001

JERICHO RD & US-2

01/00/00
6/25/2015
4th Thursday
30411710

	EB	WB	NB	SB	
L	62	30	176	15	
T	195	117	75	74	
R	335	12	54	33	1178
Enter	592	159	305	122	1178
Exit	264	326	149	439	1178
% Trucks					
Peds	0	0	0	0	

Rural Primary and Secondary

TM Count 918
DHV Adjustment 1.09
2015-2017 Growth 1.00
Total Adjustment **1.09**

	EB	WB	NB	SB
L	3	3	3	3
T	3	3	3	3
R	3	3	3	3

	EB	WB	NB	SB	
L	68	33	192	16	
T	213	128	82	81	
R	365	13	59	36	1285
Enter	646	173	333	133	1285
Exit	288	355	162	479	1285

	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

Bridge St/Railroad St/Jolina Ct

Richmond
11/10/2016
2nd Thursday
2

	EB	WB	NB	SB	
L	54	0	31	5	
T	0	0	200	296	
R	67	5	0	100	758
Enter	121	5	231	401	758
Exit	5	131	259	363	758
% Trucks	0.8%	0.0%	6.9%	2.2%	
Peds	16	0	0	2	

Rural Primary and Secondary

29 AADT * k-factor of 0.1126 599
DHV Adjustment 1.01
- Growth 1.00
Total Adjustment **1.01**

	EB	WB	NB	SB
L	3	3	3	3
T	3	3	3	3
R	3	3	3	3

	EB	WB	NB	SB	
L	54	0	31	5	
T	0	0	202	299	
R	68	5	0	101	765
Enter	122	5	233	405	765
Exit	5	132	261	366	765

	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

No Build 2017

	EB	WB	NB	SB	
L	68	33	192	16	
T	213	128	82	81	
R	365	13	59	36	1285
Enter	646	173	333	133	1285
Exit	288	355	162	479	1285

	EB	WB	NB	SB	
L	54	0	31	5	
T	0	0	202	299	
R	68	5	0	101	765
Enter	122	5	233	405	765
Exit	5	132	261	366	765

Trip Generation (Primary)

	Enter	Exit	
PM	6	7	13

Phase 1

	EB	WB	NB	SB	
L		0	1		
T			1	1	
R	2		0		6
Enter	2	0	2	1	6
Exit	0	1	1	3	6

	EB	WB	NB	SB	
L		3		3	
T	1	1			
R		2	2		13
Enter	1	7	2	3	13
Exit	6	1	2	3	13

Trip Generation (Pass by)

	Enter	Exit	
PM	1	1	2

Phase 1

	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

	EB	WB	NB	SB	
L		1		1	
T				-1	
R					1
Enter	0	1	0	0	1
Exit	1	0	0	0	1

Build 2017

	EB	WB	NB	SB	
L	68	33	193	16	
T	213	128	82	81	
R	368	13	59	36	1290
Enter	648	174	335	134	1290
Exit	288	357	163	482	1290

	EB	WB	NB	SB	
L	54	4	31	9	
T	1	1	202	298	
R	68	7	2	101	779
Enter	123	13	235	408	779
Exit	12	133	264	370	779

Annual Adjustment 2022

1	1.00
2	ERROR
3	1.00

1	ERROR
2	ERROR
3	1.00

Adjusted Raw Counts 2022

	EB	WB	NB	SB	
L	68	33	192	16	
T	213	128	82	81	
R	365	13	59	36	1285
Enter	646	173	333	133	1285
Exit	288	355	162	479	1285

	EB	WB	NB	SB	
L	54	0	31	5	
T	0	0	202	299	
R	68	5	0	101	765
Enter	122	5	233	405	765
Exit	5	132	261	366	765

No Build
2022

	EB	WB	NB	SB	
L	68	33	192	16	
T	213	128	82	81	
R	365	13	59	36	1285
Enter	646	173	333	133	1285
Exit	288	355	162	479	1285

	EB	WB	NB	SB	
L	54	0	31	5	
T	0	0	202	299	
R	68	5	0	101	765
Enter	122	5	233	405	765
Exit	5	132	261	366	765

Trip Generation (Primary)

	Enter	Exit	
PM	19	38	57

Phases 1+ 2

	EB	WB	NB	SB	
L		1	8		
T			3	2	
R	8		2		23
Enter	8	1	13	2	23
Exit	2	8	3	10	23

	EB	WB	NB	SB	
L		18		10	
T	3	7			
R		13	6		57
Enter	3	38	6	10	57
Exit	19	7	13	18	57

Trip Generation (Pass by)

	Enter	Exit	
PM	7	4	11

Phases 1+ 2

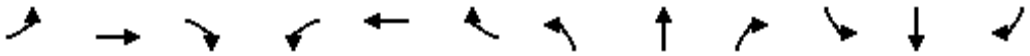
	EB	WB	NB	SB	
L					
T					
R					0
Enter	0	0	0	0	0
Exit	0	0	0	0	0

	EB	WB	NB	SB	
L		2		4	
T	1	1	-2	-4	
R		1	2		5
Enter	1	4	0	0	5
Exit	7	1	-1	-2	5

Build
2022

	EB	WB	NB	SB	
L	68	33	199	16	
T	213	128	85	82	
R	373	13	61	36	1308
Enter	653	174	346	135	1308
Exit	290	363	166	489	1308

	EB	WB	NB	SB	
L	54	20	31	19	
T	4	8	200	295	
R	68	19	8	101	827
Enter	126	47	239	415	827
Exit	31	140	273	383	827



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	70	116	47	207	11	263	52	22	17	55	94
Future Volume (vph)	56	70	116	47	207	11	263	52	22	17	55	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.94			1.00			0.99			0.93	
Flpb, ped/bikes		0.99			0.99			0.94			1.00	
Frt		0.94			0.99			0.99			0.92	
Flt Protected		0.99			0.99			0.96			0.99	
Satd. Flow (prot)		1550			1573			1597			1534	
Flt Permitted		0.87			0.91			0.68			0.95	
Satd. Flow (perm)		1370			1443			1122			1466	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	70	116	47	207	11	263	52	22	17	55	94
RTOR Reduction (vph)	0	34	0	0	1	0	0	3	0	0	40	0
Lane Group Flow (vph)	0	208	0	0	264	0	0	334	0	0	126	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Parking (#/hr)					0							
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6	6		8			4		
Actuated Green, G (s)		18.7			18.7			26.1			26.1	
Effective Green, g (s)		18.7			18.7			26.1			26.1	
Actuated g/C Ratio		0.30			0.30			0.43			0.43	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		4.0			4.0			3.0			2.0	
Lane Grp Cap (vph)		417			439			476			623	
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.18			c0.30			0.09	
v/c Ratio		0.50			0.60			0.70			0.20	
Uniform Delay, d1		17.5			18.2			14.5			11.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.3			2.7			4.8			0.1	
Delay (s)		18.8			20.9			19.2			11.2	
Level of Service		B			C			B			B	
Approach Delay (s)		18.8			20.9			19.2			11.2	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	19.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	60		

Description: US-2 / Jericho Rd/Bridge St

c Critical Lane Group

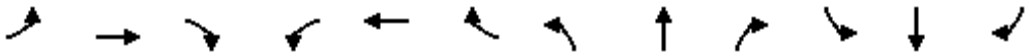
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	0	15	1	0	5	16	415	4	4	156	27
Future Vol, veh/h	25	0	15	1	0	5	16	415	4	4	156	27
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	0	15	1	0	5	16	415	4	4	156	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	639	638	179	634	649	417	192	0	0	419	0	0
Stage 1	187	187	-	449	449	-	-	-	-	-	-	-
Stage 2	452	451	-	185	200	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	389	394	864	392	389	636	1381	-	-	1140	-	-
Stage 1	815	745	-	589	572	-	-	-	-	-	-	-
Stage 2	587	571	-	817	736	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	377	384	857	380	379	636	1381	-	-	1140	-	-
Mov Cap-2 Maneuver	377	384	-	380	379	-	-	-	-	-	-	-
Stage 1	796	736	-	580	563	-	-	-	-	-	-	-
Stage 2	574	562	-	799	727	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	11.4	0.3	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1381	-	-	477	572	1140	-	-
HCM Lane V/C Ratio	0.012	-	-	0.084	0.01	0.004	-	-
HCM Control Delay (s)	7.6	0	-	13.2	11.4	8.2	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	68	213	368	33	128	13	193	82	59	16	81	36
Future Volume (vph)	68	213	368	33	128	13	193	82	59	16	81	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.92			0.99			0.98			0.96	
Flpb, ped/bikes		0.99			1.00			0.94			0.99	
Frt		0.92			0.99			0.98			0.96	
Flt Protected		0.99			0.99			0.97			0.99	
Satd. Flow (prot)		1507			1572			1572			1650	
Flt Permitted		0.95			0.85			0.77			0.94	
Satd. Flow (perm)		1434			1355			1251			1560	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	68	213	368	33	128	13	193	82	59	16	81	36
RTOR Reduction (vph)	0	38	0	0	2	0	0	10	0	0	13	0
Lane Group Flow (vph)	0	611	0	0	172	0	0	324	0	0	120	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Parking (#/hr)					0							
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6	6		8			4		
Actuated Green, G (s)		32.8			32.8			24.7			24.7	
Effective Green, g (s)		32.8			32.8			24.7			24.7	
Actuated g/C Ratio		0.44			0.44			0.33			0.33	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		4.0			4.0			3.0			2.0	
Lane Grp Cap (vph)		634			599			417			520	
v/s Ratio Prot												
v/s Ratio Perm		c0.43			0.13			c0.26			0.08	
v/c Ratio		0.96			0.29			0.78			0.23	
Uniform Delay, d1		20.1			13.2			22.2			17.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		42.6			0.4			9.4			0.1	
Delay (s)		62.6			13.5			31.6			17.9	
Level of Service		E			B			C			B	
Approach Delay (s)		62.6			13.5			31.6			17.9	
Approach LOS		E			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	19.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	60		

Description: US-2 / Jericho Rd/Bridge St

c Critical Lane Group

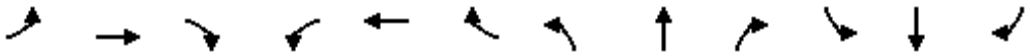
Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	54	1	68	4	1	7	31	202	2	9	298	101
Future Vol, veh/h	54	1	68	4	1	7	31	202	2	9	298	101
Conflicting Peds, #/hr	2	0	0	0	0	2	16	0	0	0	0	16
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	1	68	4	1	7	31	202	2	9	298	101

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	654	649	365	666	698	205	415	0	0	204	0	0
Stage 1	383	383	-	265	265	-	-	-	-	-	-	-
Stage 2	271	266	-	401	433	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	380	389	680	373	364	836	1144	-	-	1368	-	-
Stage 1	640	612	-	740	689	-	-	-	-	-	-	-
Stage 2	735	689	-	626	582	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	359	368	671	324	345	835	1144	-	-	1366	-	-
Mov Cap-2 Maneuver	359	368	-	324	345	-	-	-	-	-	-	-
Stage 1	611	598	-	717	668	-	-	-	-	-	-	-
Stage 2	704	668	-	557	569	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15	12.3	1.1	0.2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1144	-	-	483	508	1366	-	-
HCM Lane V/C Ratio	0.027	-	-	0.255	0.024	0.007	-	-
HCM Control Delay (s)	8.2	0	-	15	12.3	7.7	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.1	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	70	116	47	207	11	261	51	22	17	55	94
Future Volume (vph)	56	70	116	47	207	11	261	51	22	17	55	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.94			1.00			0.99			0.93	
Flpb, ped/bikes		0.99			0.99			0.94			1.00	
Frt		0.94			0.99			0.99			0.92	
Flt Protected		0.99			0.99			0.96			0.99	
Satd. Flow (prot)		1550			1573			1597			1535	
Flt Permitted		0.87			0.91			0.68			0.95	
Satd. Flow (perm)		1370			1443			1120			1466	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	70	116	47	207	11	261	51	22	17	55	94
RTOR Reduction (vph)	0	34	0	0	1	0	0	3	0	0	40	0
Lane Group Flow (vph)	0	208	0	0	264	0	0	331	0	0	126	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Parking (#/hr)					0							
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6	6		8			4		
Actuated Green, G (s)		18.6			18.6			25.9			25.9	
Effective Green, g (s)		18.6			18.6			25.9			25.9	
Actuated g/C Ratio		0.30			0.30			0.42			0.42	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		4.0			4.0			3.0			2.0	
Lane Grp Cap (vph)		417			439			474			621	
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.18			c0.30			0.09	
v/c Ratio		0.50			0.60			0.70			0.20	
Uniform Delay, d1		17.4			18.1			14.4			11.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.3			2.7			4.6			0.1	
Delay (s)		18.7			20.8			19.0			11.2	
Level of Service		B			C			B			B	
Approach Delay (s)		18.7			20.8			19.0			11.2	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	61.1	Sum of lost time (s)	19.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	60		
Description: US-2 / Jericho Rd/Bridge St			

c Critical Lane Group

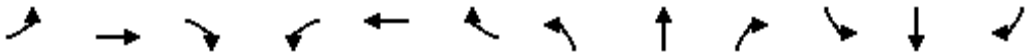
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	0	15	0	0	2	16	415	1	3	156	27
Future Vol, veh/h	25	0	15	0	0	2	16	415	1	3	156	27
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	0	15	0	0	2	16	415	1	3	156	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	688	687	193	685	700	452	208	0	0	452	0	0
Stage 1	200	200	-	486	486	-	-	-	-	-	-	-
Stage 2	488	487	-	199	214	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	360	370	849	362	363	608	1363	-	-	1109	-	-
Stage 1	802	736	-	563	551	-	-	-	-	-	-	-
Stage 2	561	550	-	803	725	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	350	360	842	350	353	608	1363	-	-	1109	-	-
Mov Cap-2 Maneuver	350	360	-	350	353	-	-	-	-	-	-	-
Stage 1	782	728	-	553	542	-	-	-	-	-	-	-
Stage 2	549	541	-	785	717	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.9	10.9	0.3	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1363	-	-	448	608	1109	-	-
HCM Lane V/C Ratio	0.013	-	-	0.097	0.004	0.003	-	-
HCM Control Delay (s)	7.7	0	-	13.9	10.9	8.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	68	213	365	33	128	13	192	82	59	16	81	36
Future Volume (vph)	68	213	365	33	128	13	192	82	59	16	81	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.92			0.99			0.98			0.96	
Flpb, ped/bikes		0.99			1.00			0.94			0.99	
Frt		0.92			0.99			0.98			0.96	
Flt Protected		0.99			0.99			0.97			0.99	
Satd. Flow (prot)		1508			1572			1572			1650	
Flt Permitted		0.95			0.85			0.77			0.94	
Satd. Flow (perm)		1435			1356			1252			1560	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	68	213	365	33	128	13	192	82	59	16	81	36
RTOR Reduction (vph)	0	38	0	0	2	0	0	11	0	0	13	0
Lane Group Flow (vph)	0	608	0	0	172	0	0	322	0	0	120	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Parking (#/hr)					0							
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6	6		8			4		
Actuated Green, G (s)		32.8			32.8			24.6			24.6	
Effective Green, g (s)		32.8			32.8			24.6			24.6	
Actuated g/C Ratio		0.44			0.44			0.33			0.33	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		4.0			4.0			3.0			2.0	
Lane Grp Cap (vph)		636			601			416			518	
v/s Ratio Prot												
v/s Ratio Perm		c0.42			0.13			c0.26			0.08	
v/c Ratio		0.96			0.29			0.77			0.23	
Uniform Delay, d1		19.9			13.1			22.2			17.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		38.2			0.4			9.3			0.1	
Delay (s)		58.1			13.5			31.5			17.9	
Level of Service		E			B			C			B	
Approach Delay (s)		58.1			13.5			31.5			17.9	
Approach LOS		E			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	60		
Description: US-2 / Jericho Rd/Bridge St			

c Critical Lane Group

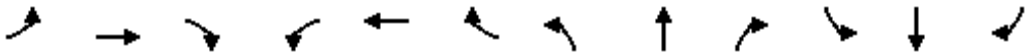
Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	54	0	68	0	0	5	31	202	0	5	299	101
Future Vol, veh/h	54	0	68	0	0	5	31	202	0	5	299	101
Conflicting Peds, #/hr	2	0	0	0	0	2	16	0	0	0	0	16
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	0	68	0	0	5	31	202	0	5	299	101

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	699	694	396	715	749	222	451	0	0	220	0	0
Stage 1	407	407	-	287	287	-	-	-	-	-	-	-
Stage 2	292	287	-	428	462	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	354	366	653	346	341	818	1109	-	-	1349	-	-
Stage 1	621	597	-	720	674	-	-	-	-	-	-	-
Stage 2	716	674	-	605	565	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	336	347	644	297	323	817	1109	-	-	1347	-	-
Mov Cap-2 Maneuver	336	347	-	297	323	-	-	-	-	-	-	-
Stage 1	591	586	-	695	650	-	-	-	-	-	-	-
Stage 2	685	650	-	533	554	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	9.4	1.1	0.1
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1109	-	-	458	817	1347	-	-
HCM Lane V/C Ratio	0.03	-	-	0.29	0.007	0.004	-	-
HCM Control Delay (s)	8.3	0	-	16.1	9.4	7.7	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	70	121	49	207	11	268	53	22	17	57	94
Future Volume (vph)	56	70	121	49	207	11	268	53	22	17	57	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.94			0.99			0.99			0.93	
Flpb, ped/bikes		0.99			0.99			0.94			1.00	
Frt		0.93			0.99			0.99			0.92	
Flt Protected		0.99			0.99			0.96			0.99	
Satd. Flow (prot)		1545			1572			1596			1536	
Flt Permitted		0.87			0.91			0.68			0.95	
Satd. Flow (perm)		1366			1437			1129			1468	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	56	70	121	49	207	11	268	53	22	17	57	94
RTOR Reduction (vph)	0	36	0	0	1	0	0	3	0	0	38	0
Lane Group Flow (vph)	0	211	0	0	266	0	0	340	0	0	130	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Parking (#/hr)					0							
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6	6		8			4		
Actuated Green, G (s)		18.9			18.9			26.8			26.8	
Effective Green, g (s)		18.9			18.9			26.8			26.8	
Actuated g/C Ratio		0.30			0.30			0.43			0.43	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		4.0			4.0			3.0			2.0	
Lane Grp Cap (vph)		414			435			485			631	
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.18			c0.30			0.09	
v/c Ratio		0.51			0.61			0.70			0.21	
Uniform Delay, d1		17.9			18.6			14.5			11.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			2.9			4.7			0.1	
Delay (s)		19.3			21.5			19.2			11.2	
Level of Service		B			C			B			B	
Approach Delay (s)		19.3			21.5			19.2			11.2	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	60		
Description: US-2 / Jericho Rd/Bridge St			

c Critical Lane Group

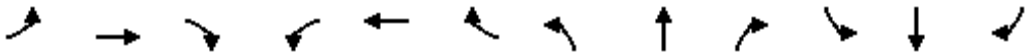
Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	2	15	4	1	11	16	415	27	14	156	27
Future Vol, veh/h	25	2	15	4	1	11	16	415	27	14	156	27
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	2	15	4	1	11	16	415	27	14	156	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	731	739	193	725	739	466	208	0	0	480	0	0
Stage 1	224	224	-	501	501	-	-	-	-	-	-	-
Stage 2	507	515	-	224	238	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	337	345	849	340	345	597	1363	-	-	1082	-	-
Stage 1	779	718	-	552	543	-	-	-	-	-	-	-
Stage 2	548	535	-	779	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	319	331	842	323	331	597	1363	-	-	1082	-	-
Mov Cap-2 Maneuver	319	331	-	323	331	-	-	-	-	-	-	-
Stage 1	760	701	-	543	534	-	-	-	-	-	-	-
Stage 2	527	526	-	749	691	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.9	12.9	0.3	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1363	-	-	411	473	1082	-	-
HCM Lane V/C Ratio	0.013	-	-	0.111	0.037	0.014	-	-
HCM Control Delay (s)	7.7	0	-	14.9	12.9	8.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	213	373	33	128	13	199	85	61	16	82	36
Future Volume (vph)	68	213	373	33	128	13	199	85	61	16	82	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.92			0.99			0.97			0.96	
Flpb, ped/bikes		0.99			1.00			0.94			1.00	
Frt		0.92			0.99			0.98			0.96	
Flt Protected		0.99			0.99			0.97			0.99	
Satd. Flow (prot)		1504			1572			1571			1651	
Flt Permitted		0.95			0.85			0.77			0.94	
Satd. Flow (perm)		1431			1352			1248			1560	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	68	213	373	33	128	13	199	85	61	16	82	36
RTOR Reduction (vph)	0	39	0	0	2	0	0	10	0	0	13	0
Lane Group Flow (vph)	0	615	0	0	172	0	0	335	0	0	121	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Parking (#/hr)					0							
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6	6		8			4		
Actuated Green, G (s)		32.9			32.9			25.6			25.6	
Effective Green, g (s)		32.9			32.9			25.6			25.6	
Actuated g/C Ratio		0.44			0.44			0.34			0.34	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		4.0			4.0			3.0			2.0	
Lane Grp Cap (vph)		626			592			425			531	
v/s Ratio Prot												
v/s Ratio Perm		c0.43			0.13			c0.27			0.08	
v/c Ratio		0.98			0.29			0.79			0.23	
Uniform Delay, d1		20.8			13.6			22.3			17.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		55.9			0.4			10.0			0.1	
Delay (s)		76.7			14.0			32.3			17.8	
Level of Service		E			B			C			B	
Approach Delay (s)		76.7			14.0			32.3			17.8	
Approach LOS		E			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	50.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	75.1	Sum of lost time (s)	19.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	60		
Description: US-2 / Jericho Rd/Bridge St			

c Critical Lane Group

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	54	4	68	20	8	19	31	200	8	19	295	101
Future Vol, veh/h	54	4	68	20	8	19	31	200	8	19	295	101
Conflicting Peds, #/hr	2	0	0	0	0	2	16	0	0	0	0	16
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	4	68	20	8	19	31	200	8	19	295	101

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	682	670	362	686	716	206	412	0	0	208	0	0
Stage 1	400	400	-	266	266	-	-	-	-	-	-	-
Stage 2	282	270	-	420	450	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	364	378	683	362	356	835	1147	-	-	1363	-	-
Stage 1	626	602	-	739	689	-	-	-	-	-	-	-
Stage 2	725	686	-	611	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	331	355	673	311	334	834	1147	-	-	1361	-	-
Mov Cap-2 Maneuver	331	355	-	311	334	-	-	-	-	-	-	-
Stage 1	598	583	-	716	668	-	-	-	-	-	-	-
Stage 2	677	665	-	536	554	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.9	14.6	1.1	0.4
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1147	-	-	457	423	1361	-	-
HCM Lane V/C Ratio	0.027	-	-	0.276	0.111	0.014	-	-
HCM Control Delay (s)	8.2	0	-	15.9	14.6	7.7	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.4	0	-	-