VERMONT AGENCY OF TRANSPORTATION (VTRANS)

BENNINGTON STP 1000(23)

INTERSECTION OF VT ROUTE 67A (NORTH BENNINGTON ROAD) AT MATTESON ROAD, SILK ROAD AND COLLEGE DRIVE

VERMONT
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wsp

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INTERSECTION OF VT ROUTE 67A (NORTH BENNINGTON ROAD) AT MATTESON ROAD, SILK ROAD AND COLLEGE DRIVE

VERMONT AGENCY OF TRANSPORTATION (VTRANS)

SCOPING REPORT (DRAFT VERSION)

PROJECT NO.: 52741 TSK 03
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1 INTRODUCTION

1.1 PROJECT BACKGROUND

The purpose of this scoping report is to examine the feasibility and approximate costs of improvements to the intersection of VT Route 67A at Silk Road and Matteson Road/Rice Lane and the adjacent intersection of VT Route 67A at Bennington College Road in North Bennington to enhance safety, mobility, and access for all users. Historically, the intersections have experienced a high number of crashes. Vehicles exiting Silk Road experience difficulty accessing VT Route 67A due to speeding and limited sight lines.

This high accident location was first assessed in 1985 and revisited again in 1989 and 1992. A Local Concerns Meeting was held on October 13, 1994. A Final Scoping Report was prepared by Vermont Agency of Transportation Planning Division in February 1996. Three alternatives were proposed, Do-Nothing, a Roundabout, and a Reconstruct Off Alignment. The Roundabout was the preferred alternative by the Town to address all project needs along with traffic calming for the vehicles moving through the area. Most research studies show that roundabouts do not reduce crashes, but they dramatically reduce injury crashes.

In October 2013, the Vermont Agency of Transportation (VTrans) conducted a location review of the intersection that contemplated the safety concerns and potential solutions. At that time, a traffic signal was not warranted, however, short term safety improvements were suggested along with a long-term solution of a roundabout. A bike/pedestrian facility named “Ninja Path” was constructed along the Northside Drive commercial corridor to connect downtown Bennington, Bennington College and other nearby bike/pedestrian facilities. This shared use path crosses Silk Road and VT Route 67A at the intersection of VT Route 67A at Silk Road and Matteson Road/Rice Lane.

The recent construction of this bike path coupled with the safety concerns at the existing intersections prompted VTrans to initiate this scoping study to determine the feasibility of extensive and long-term safety improvements at this location.

As part of this scoping project, a local concerns meeting was held on February 7, 2019 and a Town of Bennington Select Board meeting was held on January 27, 2020. Seven proposed intersection improvement alternatives were presented to the Town Select Board. The alternatives were classified as either non-preferred or shortlisted and are as follows:

- Non-preferred Alternatives:
  - Alternative 1: 3 Leg Roundabout with Relocated Bennington College Access
  - Alternative 2: 4 Leg Roundabout with Relocated Bennington College Access
  - Alternative 4: 5 Leg Roundabout Shift West
  - Alternative 7: Traditional Stop Control or Signalized Intersection
- Shortlisted Alternatives:
  - Alternative 3: 5 Leg Oval Roundabout
  - Alternative 5: 1996 Study Modified – 5 Leg Circular Roundabout
  - Alternative 6: 5 Leg Elliptical Roundabout

The Town Select Board members voted unanimously for Alternative 6 which is considered as the preferred alternative in this scoping study. The Town Select Board meeting minutes relevant to this project are included in Appendix F.

The purpose of this scoping report is to document the analysis and development of these improvement alternatives, as well as, the public feedback received throughout the process of the scoping study.

1.2 PROJECT STUDY AREA LIMITS

The project study area includes VT Route 67A from the west of its intersection with Bennington College Road to the east of its intersection with Silk Road and Matteson Road/Rice Lane in Bennington, Vermont. The projet study area is illustrated on Figure 1.

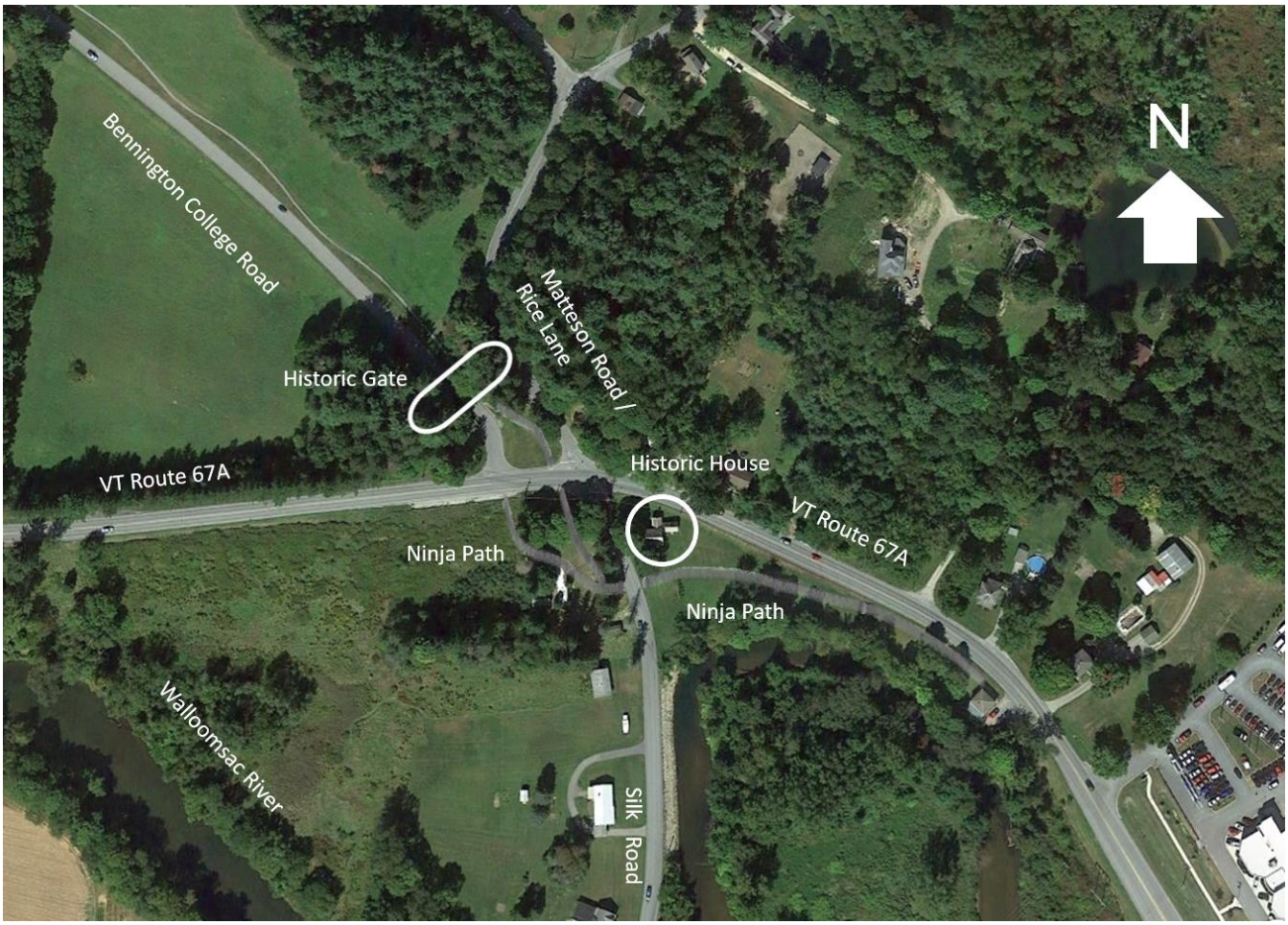


Figure 1: Location Map

2 PURPOSE AND NEED

2.1 PURPOSE

The purpose of this scoping project is to examine the feasibility and approximate costs of improvements to the intersection of VT Route 67A at Silk Road and Matteson Road/Rice Lane and the adjacent intersection of VT Route 67A at Bennington College Road in North Bennington to enhance safety, mobility, and access for all users.

Historically, the intersections have experienced a high number of crashes. Short term modifications have been made at the intersections including a Rectangular Rapid Flashing Beacon (RRFB) and installation of small islands along the center of VT Route 67A to highlight the bike path crossing and to encourage slower vehicular travel. It appears that the current crash mitigation measures have not solved the root cause of the crashes at this location. The combination of vehicle speeds and limited sight distance continue to pose a high-risk environment. Both factors need to be addressed with the alternative selected for this project.

2.2 NEED

The intersection of VT Route 67A at Silk Road and Matteson Road/Rice Lane and the adjacent intersection of VT Route 67A at Bennington College Road improvement alternatives shall:

- Provide a safer environment for all users,
- Improve sight lines, and
- Improve access for all modes.

The intersection of VT Route 67A at Silk Road and Matteson Road/Rice Lane and the adjacent intersection of VT Route 67A at Bennington College Road Scoping Report will:

- Present various improvement alternatives and the associated impacts,
- Document public feedback, and
- Propose a preferred alternative for further development and construction.

3 ROADWAY INFORMATION

3.1 EXISTING ROADWAY AND INTERSECTION GEOMETRY

WSP conducted field inventory of the study area intersections. The intersection geometry, traffic controls, land use, parking regulations, and pedestrian accommodations were evaluated.

3.1.1 *VT ROUTE 67A AT SILK ROAD AND RICE LANE*

At the east terminus of the study area, Silk Road from the south and Rice Lane from the north intersect with VT Route 67A to form a four-way intersection.

VT Route 67A is two-way separated by a double yellow centerline. In addition, the west leg is separated by two small raised traffic islands that act as a pedestrian refuge for pedestrians crossing VT Route 67A. The pedestrian crossing at this location features a rectangular rapid flashing beacons warning drivers to yield when activated by the pedestrian push buttons located on either side of VT Route 67A.

Matteson Road/Rice Lane, the northern leg of the intersection, is stop controlled and consists of a single lane in each direction separated by a double yellow centerline. No pedestrian accommodations are provided across Matteson Road/Rice Lane. A shared use path, known as the Ninja Path, is present along a portion of the west side of Matteson Road/Rice Lane connecting to the pedestrian crossing on the west leg of VT Route 67A.

Silk Road, the southern leg of the intersection, is also stop controlled and consists of single lane in each direction separated by a double yellow centerline. No pedestrian accommodations are provided across Silk Road at the intersection. The shared use Ninja Path runs along Silk Road approximately 30 feet to the west before crossing Silk Road to continue east. A pedestrian crossing is provided across Silk Road approximately 160 feet south of VT Route 67A at its intersection with the Ninja path. Further south along Silk Road a covered bridge spans the Walloomsac River. This structure limits large vehicles approaching VT Route 67A from Silk Road.

3.1.2 *VT ROUTE 67A AT BENNINGTON COLLEGE ROAD*

At the west terminus of the of the study area, Bennington College Road intersects VT Route 67A from the north forming a T intersection approximately 120 feet west of its intersection with Silk Road and Matteson Road/Rice Lane.

VT Route 67A is two-way separated by a double yellow centerline. Bennington College Road, the northern leg of the intersection, is two-way and operates under stop control. No pedestrian accommodations are provided along VT Route 67A nor Bennington College Road. The shared use Ninja Path runs along Bennington College Road and terminates approximately 85 feet north of the intersection.

3.2 EXISTING TRAFFIC VOLUMES

VTrans classifies VT Route 67A as a minor arterial, while both Matteson Road/Rice Lane and Silk Road are classified as major collectors. Bennington College Road is a private road providing access to Bennington College. The most recent available AADT (Annual Average Daily Traffic) data from 2018 for VT Route 67A shows daily traffic volumes of 7,099 west of the intersection, while the most recent AADT from 2013 for Matteson Road/Rice Lane shows daily traffic volume of 1,900 north of the intersection. There is no AADT information for Silk Road. The speed limit on VT Route 67A is 40 mph while the speed

limit for both Matteson Road/Rice Lane and Silk Road is 35 mph in the immediate area. Bennington College Road was assumed to operate at a speed of 25 mph. The advisory speed on VT Route 67A at the intersection is posted at 35 mph.

The land use surrounding the intersection is mostly residential, except for the Bennington College located northwest of the intersection. There are businesses located approximately 1,000 feet east of the intersection.

Turning movement counts (TMC) from Monday, July 9th, 2012 for the PM peak period and Tuesday, July 10th, 2012 for the AM peak period were obtained from the VTrans Transportation Data Management System and are included in Appendix A-1. It was determined by these counts that the AM peak hour is from 8:00 AM to 9:00 AM and the PM peak hour is from 4:00 PM to 5:00 PM. WSP collected additional TMC on February 28th, 2019 for the established AM and PM peak hours. These counts are also included in Appendix A-1.

The volumes were used for the Manual on Uniform Traffic Control Devices (MUTCD) signal warrant calculations.

3.3 FUTURE TRAFFIC VOLUMES

Future condition traffic volumes were developed by researching an appropriate background traffic growth rate. To calculate the annual growth rate, WSP gathered historical AADT from VTrans Transportation Management System. Table 3.1 shows the historical AADT and the calculated annual growth rate.

Year	AADT	Annual Growth Rate
2014	7,000	0.35%
2018	7,099	

Table 3.1: Annual Growth Rate

The existing peak hour traffic volumes were increased by 0.35 percent per year to determine the 2040 Future Conditions in the analysis and are included in Appendix A-2.

3.4 INTERMODAL USES

There are no pedestrian accommodations provided along VT Route 67A, Bennington College Road, Silk Road or Rice Lane roadways leading in and out of the intersection. VT Route 67A has minimal shoulders leading in and out of the intersection which do not enhance bicycle or pedestrian travel.

A bike/pedestrian shared use path known as “Ninja Path” was constructed along the Northside Drive commercial corridor to connect downtown Bennington and Bennington College and other nearby bike/pedestrian facilities. Ninja Path diverges pedestrian traffic from bicycle traffic about 160 feet south of VT Route 67A past its intersection with Silk Road. The pedestrian path crosses VT Route 67A about 45 feet west of the intersection with Silk Road/Rice Lane. The pedestrian crossing at this location consists of rectangular rapid flashing beacons warning drivers to yield when activated by the pedestrian push buttons located on either side of VT Route 67A. The shared use path connects to VT Route 67A directly across from Bennington College Drive access. The shared use path crossing with VT Route 67A is controlled by stop signs.

3.5 SAFETY ANALYSIS

The following sections discuss the recorded crashes at the intersection during a four-year period (2015-2018) as well as the expected crash reductions if a roundabout is constructed.

REVIEW OF HISTORICAL CRASH DATA

The total number of crashes recorded at the intersection for the analysis period (2015-2018) was seventeen (17). Out of the seventeen (17) crashes, six (6) were due to snowy or wet pavement conditions; one (1) crash was caused by a crossing deer; one (1) was due to an inexperience driver making a fast turn; and one (1) was due to a driver under the influence (DUI).

The remaining eight (8) crashes were due to poor sight distance, especially for vehicles approaching from Silk Road.

Table 3.2 and Table 3.3 summarize the eight (8) crashes by type and by severity for each year, respectively.

Crash Type	2015	2016	2017	2018	Total
Angle	1	0	5	2	8

Table 3.2: Total Crashes by Type

Crash Type	2015	2016	2017	2018	Total
Possible Injury	0	0	0	1	1
PDO, Property Damage Only	1	0	5	1	7

Table 3.3: Total Crashes by SeverityTable 3.4: Total Crashes by Severity

CRASH MODIFICATION FACTOR ANALYSIS

The Highway Safety Manual (HSM) provides models to calculate a crash modification factor (CMF) which is used to predict the average crash frequency to assess the effects of a proposed design. However, the HSM does not provide specific models to calculate the predicted crash frequency for converting a two-way stop-controlled intersection into a roundabout or into a signalized intersection.

The CMF Clearinghouse contains a web-based database of CMFs along with supporting documentation that can be used to identify the most appropriate CMF. These CMFs are a result of research projects performed at specific locations but can be applied in other locations, if the traffic and geometric characteristics are similar. In many cases, these CMFs follow the HSM principles and guidelines.

For assessing the construction of a roundabout and the installation of a traffic signal, the CMF Clearinghouse provides the following models summarized in Table 3.5. Although the installation of a traffic signal is not warranted at this location, it was included in this analysis for comparison purposes.

Countermeasure	Crash Type	Crash Severity	CMF	Study
Conversion of a two-way stop-controlled intersection into single- or multi-lane roundabout	All	All	0.751	Evaluation of Roundabout Safety, Qin et al., 2013
Install a Traffic Signal	All	All	0.85	Development of Models to Quantify the Impacts of Signalization on Intersection Crashes, Pernia et al., 2002

Table 3.5: CMF Clearinghouse Models

The CMF was used to calculate the predicted crash frequency for the roundabout alternatives and the installation of the traffic signal. It was assumed that the roundabout CMF value would be the same for all three roundabout alternatives. Table 3.6 shows the resulting crash frequency for each countermeasure.

Countermeasure	Total Crashes (4-year period)	Current Crashes per Year	CMF	Predicted Crashes per Year
Roundabout (Alternatives 3, 5 & 6)	8	2	0.751	1.5
Traffic Signal (Alternative 7)			0.85	1.7

Table 3.6: Predicted Crash Frequency

Based on Table 3.6, a roundabout would provide a 25% reduction in crashes per year, while traffic signal would provide a 15% reduction in crashes per year.

3.6 FLOODPLAIN

The existing VT Route 67A is above the Walloomsac River 100-year Flood Plain at this location. There are no known elevation changes that have occurred in the vicinity of the project location, thus updated hydraulic data was not requested. Potential roadway work may occur within the Walloomsac 100-year Flood Plain along VT Route 67A east of the intersection with Silk Road and along Silk Road south of the intersection with VT Route 67A. This will be further considered as design advances.

3.7 RIGHT-OF-WAY

The existing VT State highway Route 67A right-of-way width is 3-rod (49.5 feet) throughout the project length. The existing right-of-way width of Town roads Silk Road and Matteson Road/Rice Lane is 3-rod (49.5 feet) within the project limits. Abutting along the north side of VT Route 67A is Bennington College who owns the property containing College Drive and both sides of Matteson Road/Rice Lane. Abutting Bennington College's property east of Rice Lane is private property (Book 422 – Page 96). Abutting along the south side of VT Route 67A is Bennington College who owns the property and both sides of Silk Road.

3.8 HISTORIC

The project study area includes two historic structures: the historic gate across Bennington College Drive and the historic "Silk Road" house (DHP building #0202-166) south of VT Route 67A and east of Silk Road. Both structures are located within Bennington College property.

The conceptual alternatives have been developed with the intent to minimize or avoid impact to the historic structures.

3.9 TRAFFIC SIGNAL WARRANT ANALYSIS

WSP conducted a traffic signal warrant analysis for the intersection based on the methodologies outlined in the 2009 Edition of the Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD contains traffic volume thresholds for several conditions that would warrant the installation of a traffic signal.

WSP conducted the signal warrant analysis based on the following MUTCD warrants:

1. Warrant 1, Eight-Hour Vehicular Volume
2. Warrant 2, Four-Hour Vehicular Volume
3. Warrant 3, Peak Hour Volumes
4. Warrant 4, Pedestrian Volumes
5. Warrant 5, School Crossing
6. Warrant 6, Coordinated Signal System
7. Warrant 7, Crash Experience
8. Warrant 8, Roadway Network
9. Warrant 9, Intersection Near a Grade Crossing

The warrant analysis was calculated for single lane approaches on VT Route 67A (the major street) and single lane approaches on Rice Lane/Silk Road (minor street). The warrant criteria were reviewed based on weekday traffic volumes. Given that the 2012 TMC obtained from the VTrans Transportation Data Management System includes 12-hour count data, that information is used for the traffic signal warrant. The TMC were forecasted to 2019 based on the 0.35% annual growth rate.

The traffic signal warrant calculations are included in Appendix B-1 and discussed in the following sub-sections.

WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Warrant 1, Eight-Hour Vehicular Volume includes different volume threshold conditions based on the number of lanes at an intersection and the traveling speed at the intersection. To warrant a signal, the intersection must meet either Condition A – Minimum Vehicular Volume or Condition B – Interruption of Continuous Traffic. Condition A and Condition B have different traffic volume thresholds that must be met for eight hours for either condition to warrant a traffic signal. If the intersection does not meet the criteria for a signal under either Condition A or Condition B, the intersection could merit a signal under a combination condition. This combination method uses 80% of vehicular volumes and requires that both Condition A-Minimum Vehicular Volume and Condition B-Interruption of Continuous Traffic be met.

For the conditions at this intersection, major street volumes of 500 and minor street volumes of 150 would be required to meet Condition A. Major street volumes of 750 and minor street volumes of 75 would be required to meet Condition B.

The weekday traffic volumes did not meet the criteria for Condition A-Minimum Vehicular Volume, nor did it meet the criteria for Condition B-Interruption of Continuous Traffic of the eight-hour warrant. The weekday traffic volumes did not meet the criteria for the combination condition.

WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

The thresholds for Warrant 2, Four-Hour Vehicular Volume are presented as curves based on the number of lanes. For the four-hour warrant, at least four hours of data must have main street and side street traffic volumes fall above the proper curve. This intersection does not meet the criteria for the four-hour warrant.

WARRANT 3, PEAK HOUR

For Warrant 3, Peak Hour are presented as curves based on the number of lanes. For the peak hour warrant, only one hour of data must fall above the proper curve. This intersection does not meet the criteria for the peak hour warrant.

WARRANT 4, PEDESTRIAN VOLUME

For Warrant 4, pedestrian volume, the intersection must experience a minimum pedestrian volume of 100 for any four hours of an average day or a minimum pedestrian volume of 190 during any given hour. This intersection does not meet the criteria for the pedestrian warrant.

WARRANT 5, SCHOOL CROSSING

For Warrant 5, school crossing, the intersection must experience a minimum of 20 schoolchildren crossing during the highest crossing hour. This intersection does not meet the criteria for the school crossing warrant.

WARRANT 6, COORDINATED SIGNAL SYSTEM

For Warrant 6, coordinated signal system, one of following criteria must be met: on a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning; or on a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation. This intersection does not meet the criteria for the coordinated signal system warrant.

WARRANT 7, CRASH EXPERIENCE

To meet the criteria for Warrant 7, crash experience the following conditions must be met: Condition A specifies that the intersection must have gone through remedial measures to reduce the crash frequency; Condition B requires the occurrence of five or more crashes within a twelve-month period susceptible to correction by traffic signal control; and Condition C requires that thresholds be met for each of any eight hours of an average day or specific thresholds relating to pedestrian volume.

Remedial measures have been taken at this intersection to reduce vehicle crash frequency, such as the installation of Rectangular Rapid Flash Beacon (RRFB) and a pedestrian refuge. The intersection had five crashes in 2017 which are

susceptible to correction by traffic signal control but the thresholds for pedestrian volumes were not met at this intersection. Thus, the intersection did not meet the criteria for the crash experience warrant.

WARRANT 8, ROADWAY NETWORK

To meet the criteria for Warrant 8, the intersection of two or more major routes must meet one or both of the following criteria: Condition A - the intersection has a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and has 5-year projected traffic volumes, based on an engineering study, that meet one or more of Warrants 1, 2, and 3 during an average weekday; or Condition B - the intersection has a total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a non-normal business day (Saturday or Sunday). The major street (Route 67A) is important for the through traffic in Bennington, however, the intersection is not a major intersection serving high traffic volumes. This intersection does not meet the criteria for the roadway network warrant.

WARRANT 9, INTERSECTION NEAR A GRADE CROSSING

To meet the criteria for Warrant 9, both of the following criteria must be met: Condition A - a grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach; and Condition B - during the highest traffic volume hour during which rail traffic uses the crossing, the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the minor-street approach that crosses the track (one direction only, approaching the intersection) falls above the applicable curve.

There is no rail crossing in the vicinity of the intersection, and hence, the intersection did not meet the intersection near a grade crossing warrant.

The summary of all nine (9) MUTCD signal warrants is shown in Table 3.7.

Warrant	Description	Warrant Met?	Justification
1	Eight-Hour Vehicular Volume	No	The basic minimum hourly volume criterion is not met. The major-street speed limit does not exceed 40 mph or the intersection is not in an isolated community with a population less than 10,000.
2	Four-Hour Vehicular Volume	No	For any four-hour, the combination of major-street and minor-street volumes per hour do not fall above the specified curve in MUTCD figure 4C-1.
3	Peak Hour	No	For the same one-hour, the volume on the minor-street approach does not equal or exceed 100 vph or 800 vph on the major street. For any hour, the combination of major street and minor street volumes does not fall above the specified curve in MUTCD figure 4C-3.
4	Pedestrian Volume	No	Pedestrian volumes per hour in any one-hour volume are too low and do not meet the criteria for signal installation.
5	School Crossing	No	School children are not using the intersection to cross the major street.
6	Coordinated Signal System	No	There is no nearby signalized intersection on the major street to be part of a coordinated signal system.
7	Crash Experience	No	Both criteria for crash experience are met, however, the 80 percent volumes of the combination of the major-street and minor-street volumes for any eight-hour do not meet the volumes specified in MUTCD Table 4C-1.
8	Roadway Network	No	The major street is important for the through traffic in Bennington, but the intersection is not a major intersection serving high traffic volumes.
9	Intersection Near a Grade Crossing	No	The approach lanes of the intersection are not near a rail track crossing.

Table 3.7: MUTCD Signal Warrants Summary

3.10 DESIGN CRITERIA

The design standards for this intersection improvement project along Route 67A are the Vermont State Standards, dated October 22, 1997. Minimum standards are based on an ADT of 7,099, a DHV of 710, and a design speed of 40 mph for a Minor Arterial.

Design Criteria	Source	Existing Condition	Minimum Standard	Comment
Approach Lane and Shoulder Widths	VSS Table 4.6	11'/3' (28')	11'/5' (32')	Substandard
Clear Zone Distance	VSS Table 4.4		16' fill (1:4 or flatter) 14' cut (1:3) 14' cut (1:4 or flatter)	
Superelevation	VSS Section 4.13	5% (max)	8% (max) 6% (max) (at intersections)	Acceptable
Speed		40 mph	40 mph (Design)	
Horizontal Alignment	AASHTO 2011 Green Book Table 3-9	R = 301' (min)	Rmin = 1190' @ 5% Rmin = 643' @ 6%	Substandard
Vertical Grade	VSS Table 4.5	2% (max)	6% (max) for rolling terrain	Acceptable
K Values for Vertical Curves	VSS Table 4.1	No Issues	80-120 (crest) 70-90 (sag)	
Stopping Sight Distance	VSS Table 4.1	No Issues	325'-400'	
Corner Sight Distance	VSS Table 4.2	344'	495'	Substandard
Bicycle/Pedestrian Criteria	VSS Table 4.7	2' shoulder (min)	3' shoulder	Substandard

Table 3.8: Design Criteria

4 ALTERNATIVES

4.1 NON-PREFERRED ALTERNATIVES

As part of the scoping project, six (6) roundabout conceptual alternatives were considered in addition to the signalized intersection alternative. Based on intersection signal warrant analysis and the need to maintain Bennington College Road access from VT Route 67A, Alternatives 1, 2, 3 and 7 were eliminated from the shortlisted alternatives. Alternative 4 was eliminated from the shortlisted alternatives because of lack of horizontal sight distance improvements on Silk Road approach to the intersection. In addition, the Bennington College historic gate would be impacted by these non-preferred alternatives which are identified as follows:

- Alternative 1: 3 Leg Roundabout with Relocated Bennington College Access
- Alternative 2: 4 Leg Roundabout with Relocated Bennington College Access
- Alternative 4: 5 Leg Roundabout Shift West
- Alternative 7: Traditional Stop Control or Signalized Intersection

The conceptual layouts of the non-preferred alternatives are included in Appendix B-1.

4.2 SHORTLISTED ALTERNATIVES

In order to maintain access to Bennington College from VT Route 67A and minimize impact to the Bennington College historic gate, the following three (3) conceptual alternatives were identified as the Shortlisted Alternatives:

- Alternative 3: 5 Leg Oval Roundabout
- Alternative 5: 1996 Study Modified – 5 Leg Circular Roundabout
- Alternative 6: 5 Leg Elliptical Roundabout

The conceptual layouts of the shortlisted alternatives are included in Appendix B-2.

INTERSECTION OPERATIONS

The traffic operations of the study intersection were analyzed based on the methodologies outlined in the Highway Capacity Manual (HCM) 6th Edition.

The level of service (LOS) is a calculation of control delay for an intersection. LOS is an indication of driver discomfort, frustration, fuel consumption, and lost time. LOS is defined by an index from A through F, with A being the best and F being the worst. The HCM lists the following definitions for each grade:

- A = Free Flow
- B = Reasonably free flow
- C = Stable flow
- D = Approaching unstable flow
- E = Unstable flow
- F = Forced flow, volume is greater than capacity

The intersection under study is currently a Two-Way Stop-Controlled (TWSC), and the LOS for the TWSC is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements. (Source HCM 2010)

Capacity is a measurement of the ability of an intersection design to accommodate all movements within the intersection. Delay is the measure of the user quality of service.

The LOS assignments for both TWSC intersections and roundabouts as compared to delay values are shown in Table 4.1.

Level of Service	Average Delay (seconds)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Table 4.1: TWSC Intersection & Roundabout Level of Service Criteria

Trafficware's Synchro 10/SimTraffic software was used to perform the traffic analysis for the existing TWSC conditions for year 2019 and for year 2040 (No-Build). Synchro/SimTraffic provides delay per vehicle as well as queue length results.

PTV's Vissim 10 software was used to perform the traffic analysis for the shortlisted roundabout alternatives for year 2040: Alternative 3, Alternative 5 and Alternative 6. This program provides delay per vehicle as well as queue length results.

INTERSECTION CAPACITY ANALYSIS

The Synchro 10/SimTraffic results for both the existing (2019 and 2040) Two-way Stop Controlled (TWSC) intersection analysis as well as the Vissim results for the three (3) roundabout alternatives are described in this section. All analyses were performed for the AM and PM peak hours. An average of ten (10) Vissim microsimulation runs was performed to provide delay and maximum queue length for each alternative. An average of ten (10) SimTraffic microsimulation runs was also performed to provide the 95th percentile queue length[1] for the signalized conditions while the delay was obtained in Synchro. Results for the ten (10) simulated runs in Vissim for each alternative are in Appendix G. The full print out of the Synchro results and the SimTraffic results are documented in Appendix H.

SYNCHRO/SIMTRAFFIC TWO-WAY STOP-CONTROLLED (TWSC) RESULTS

The Synchro/SimTraffic results for the existing Two-Way Stop-Controlled (TWSC) intersection for year 2019 are presented in Table 4.2.

[1] The 95th-percentile queue is defined to be the queue length (in feet) that has a 5-percent probability of being exceeded during the analysis time period.

Approach (VT Route 67A & Rice Ln/Silk Rd)	2019 AM Peak Hour				2019 PM Peak Hour			
	Lane Group	Delay[1]	LOS	Queue Length[2]	Lane Group	Delay[1]	LOS	Queue Length[2]
EB Route 67A (Free)	LTR	0.3	A	26	LTR	0.3	A	46
WB Route 67A (Free)	LTR	0.1	A	<25	LTR	0.5	A	40
SB Rice Lane (Stop Control)	LTR	14.4	B	47	LTR	32.7	D	93
NB Silk Road (Stop Control)	LTR	12.9	B	39	LTR	21.1	C	64
Approach (VT Route 67A & College Road)	2019 AM Peak Hour				2019 PM Peak Hour			
	Lane Group	Delay[1]	LOS	Queue Length[2]	Lane Group	Delay[1]	LOS	Queue Length[2]
EB Route 67A (Free)	LTR	0.6	A	28	LTR	0.2	A	<25
WB Route 67A (Free)	LTR	0.0	A	52	LTR	0.0	A	<25
SB College Road (Stop Control)	LTR	12.3	B	<25	LTR	18.2	C	77

Overall – Existing Conditions Year 2019	AM Peak		PM Peak	
	Delay[1]	LOS	Delay[1]	LOS
VT Route 67A & Rice Lane/Silk Road	2.6	A	5.1	A
VT Route 67A & College Road	1.0	A	2.2	A

1 Delay is reported in seconds per vehicle.

2 Queue length is measured in feet

Table 4.2: Synchro/SimTraffic Analysis Results –Existing Conditions Year 2019

The Synchro/SimTraffic results for the Two-Way Stop-Controlled (TWSC) intersection for year 2040 No-Build are presented in Table 4.3.

Approach (VT Route 67A & Rice Ln/Silk Rd)	2040 AM Peak Hour				2040 PM Peak Hour			
	Lane Group	Delay[1]	LOS	Queue Length[2]	Lane Group	Delay[1]	LOS	Queue Length[2]
EB Route 67A (Free)	LTR	0.3	A	25	LTR	0.3	A	42
WB Route 67A (Free)	LTR	0.1	A	<25	LTR	0.5	A	47
SB Rice Lane (Stop Control)	LTR	15.2	C	48	LTR	42.5	E	95
NB Silk Road (Stop Control)	LTR	13.4	B	40	LTR	24.9	C	76
Approach (VT Route 67A & College Road)	2040 AM Peak Hour				2040 PM Peak Hour			
	Lane Group	Delay[1]	LOS	Queue Length[2]	Lane Group	Delay[1]	LOS	Queue Length[2]
EB Route 67A (Free)	LTR	0.6	A	33	LTR	0.2	A	36
WB Route 67A (Free)	LTR	0.0	A	<25	LTR	0.0	A	<25
SB College Road (Stop Control)	LTR	12.6	B	54	LTR	20.5	C	87

Overall – Future No-Build Year 2040	AM Peak		PM Peak	
	Delay[1]	LOS	Delay[1]	LOS
VT Route 67A & Rice Lane/Silk Road	2.6	A	6.1	A
VT Route 67A & College Road	1.0	A	2.5	A

1 Delay is reported in seconds per vehicle.

2 Queue length is measured in feet

Table 4.3: Synchro/SimTraffic Analysis Results –No Build Conditions Year 2040

VISSIM ROUNDABOUT ALTERNATIVE 3 RESULTS

The Vissim results for the roundabout Alternative 3 for year 2040 are presented in Table 4.4.

Approach (VT Route 67A & Rice Ln/Silk Rd/College Rd)	2040 AM Peak Hour				2040 PM Peak Hour			
	Lane Group	Delay[1]	LOS	Queue Length[2]	Lane Group	Delay[1]	LOS	Queue Length[2]
EB Route 67A (Yield)	LTR	3.8	A	55	LTR	12.2	B	210
WB Route 67A (Yield)	LTR	4.7	A	75	LTR	17.1	C	310
SB Rice Lane (Yield)	LTR	5.2	A	40	LTR	13.8	B	65
SB College Road (Yield)	LTR	3.5	A	25	LTR	12.5	B	70
NB Silk Road (Stop Control)	LTR	6.3	A	35	LTR	9.7	A	55

Overall – Alternative 3 Year 2040	AM Peak		PM Peak	
	Delay[1]	LOS	Delay[1]	LOS
VT Route 67A & Rice Lane/Silk Road/College Road	4.4	A	14.5	B

1 Delay is reported in seconds per vehicle.

2 Queue length is measured in feet

Table 4.4: Vissim Analysis Results – Alternative 3 Year 2040

VISSIM ROUNDABOUT ALTERNATIVE 5 RESULTS

The Vissim results for the roundabout Alternative 5 for year 2040 are presented in Table 4.5.

Approach (VT Route 67A & Rice Ln/Silk Rd/College Rd)	2040 AM Peak Hour				2040 PM Peak Hour			
	Lane Group	Delay[1]	LOS	Queue Length[2]	Lane Group	Delay[1]	LOS	Queue Length[2]
EB Route 67A (Yield)	LTR	2.6	A	45	LTR	12.4	B	235
WB Route 67A (Yield)	LTR	5.4	A	80	LTR	19.1	C	405
SB Rice Lane (Yield)	LTR	4.2	A	30	LTR	12.8	B	70
SB College Road (Yield)	LTR	2.5	A	25	LTR	8.5	A	90
NB Silk Road (Stop Control)	LTR	8.1	A	30	LTR	15.3	C	70

Overall – Alternative 5 Year 2040	AM Peak		PM Peak	
	Delay[1]	LOS	Delay[1]	LOS
VT Route 67A & Rice Lane/Silk Road/College Road	4.1	A	15.5	C

1 Delay is reported in seconds per vehicle.

2 Queue length is measured in feet

Table 4.5: Vissim Analysis Results – Alternative 5 Year 2040

VISSIM ROUNDABOUT ALTERNATIVE 6 RESULTS

The Vissim results for the roundabout Alternative 6 for year 2040 are presented in Table 4.6.

Approach (VT Route 67A & Rice Ln/Silk Rd/College Rd)	2040 AM Peak Hour				2040 PM Peak Hour			
	Lane Group	Delay[1]	LOS	Queue Length[2]	Lane Group	Delay[1]	LOS	Queue Length[2]
EB Route 67A (Yield)	LTR	1.9	A	50	LTR	5.9	A	160
WB Route 67A (Yield)	LTR	3.1	A	70	LTR	11.4	B	265
SB Rice Lane (Yield)	LTR	3.3	A	25	LTR	8.9	A	55
SB College Road (Yield)	LTR	2.4	A	25	LTR	9.5	A	65
NB Silk Road (Stop Control)	LTR	5.2	A	25	LTR	9.8	A	45

Overall – Alternative 6 Year 2040	AM Peak		PM Peak	
	Delay[1]	LOS	Delay[1]	LOS
VT Route 67A & Rice Lane/Silk Road/College Road	2.6	A	9.2	A

1 Delay is reported in seconds per vehicle.

2 Queue length is measured in feet

Table 4.6: Vissim Analysis Results – Alternative 6 Year 2040

The overall delay and LOS for the existing condition show that the intersection operates well, except for the southbound Rice Lane approach with a delay of 32.7 seconds and a LOS D. The conditions worsen in 2040 which shows an approach delay of 42.5 seconds and a LOS E.

The shortlisted roundabout alternatives would provide similar results for the AM peak with delays and LOS A. The results are slightly different for the PM peak, being Alternative 5 with the worst results (although still acceptable) having an overall intersection delay of 15.5 seconds and LOS C.

The longest maximum queues are observed for the westbound Route 67A approach during the PM peak hour, with as long as 405 feet for Alternative 5.

5 EVALUATION

5.1 EVALUATION OF THE SHORTLISTED ALTERNATIVES

Appendix D includes the Evaluation Matrix which is a comparison of the shortlisted alternatives against the No-Build alternative.

The alternatives evaluation was based on the following factors:

- Construction Cost
- Level of Service and Queue Length
- Potential Right-Of-Way Impacts
- Horizontal Sight Distance Improvements
- Construction Duration
- Safety and Crash Reduction
- Environmental Impacts
- Benefit-Cost Ratio

The estimated construction cost of each of the three shortlisted alternatives is very close. Appendix C includes the construction cost estimates and Benefit-Cost analysis results of the three shortlisted alternatives. Each of the shortlisted alternatives would take about 18 months to build with phased construction. One travel lane in each direction will remain open at all times during construction. Each of the shortlisted alternatives has minimal right-of-way and environmental impacts.

6 PREFERRED ALTERNATIVE

6.1 ALTERNATIVE 6: 5 LEG ELLIPTICAL ROUNDABOUT

As part of this scoping project, a Town of Bennington Select Board meeting was held on January 27, 2020. The Non-Preferred Alternatives and the Shortlisted Alternatives were presented to the Town Select Board.

After evaluation of the shortlisted alternatives against the No-Build alternative, the Town Select Board members voted unanimously for Alternative 6 which is considered as the preferred alternative in this scoping study. The Town Select Board meeting minutes relevant to this project are included in Appendix F.

The evaluation matrix showed that Alternative 6 has the most positive benefit. The conceptual layout of Alternative 6 is included in Appendix B-2. Alternative 6 is recommended over the other short-listed alternatives for the following reasons:

1. Alternative 6 provides the lowest impervious area which offers greater area to mitigate stormwater runoff.
2. Alternative 6 has the most roadway deflection of the roundabout approaches which provides the highest traffic calming for vehicles moving through the area.
3. Alternative 6 provides the highest sight distance improvements.
4. Alternative 6 provides the lowest traffic delay and a traffic Level of Service A at both AM and PM peak periods.

Alternative 6 will provide a safer environment for all users, improve sight lines, and improve access for all transportation modes.

APPENDIX

A TRAFFIC COUNTS

APPENDIX

A-1 *TURNING MOVEMENTS*

Turning Movement Count Report - Cars & Trucks

INT ID	ROAD 1	ROAD 2	ROAD 3	ROAD 4	COMMUNITY	TMC DATE
30202825	RICE LN	VT-67A	SILK RD	VT-67A	BENNINGTON	7/10/2012

CARS

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Interval Total	PEDS
6:00 AM	1	1	0	0	2	0	14	0	0	14	1	0	1	0	2	1	18	2	1	21	39	3
6:15 AM	0	1	1	0	2	0	29	6	1	35	5	0	4	1	9	1	15	1	0	17	63	
6:30 AM	4	1	0	0	5	0	49	4	0	53	3	1	7	0	11	0	33	2	0	35	104	
6:45 AM	4	1	3	0	8	0	46	6	0	52	3	0	4	0	7	1	29	3	0	33	100	
7:00 AM	4	0	3	0	7	1	42	7	0	50	4	1	0	0	5	1	25	4	0	30	92	0
7:15 AM	3	3	2	0	8	4	59	12	0	75	6	3	4	0	13	0	23	6	0	29	125	
7:30 AM	2	5	3	0	10	4	44	6	0	54	4	2	1	0	7	1	26	2	0	29	100	
7:45 AM	7	3	5	0	15	1	59	18	0	78	9	3	4	0	16	1	34	8	0	43	152	
8:00 AM	5	3	6	0	14	3	54	12	0	69	13	5	0	0	18	0	30	4	0	34	135	0
8:15 AM	8	9	3	0	20	1	57	10	0	68	7	2	1	0	10	3	39	7	0	49	147	
8:30 AM	14	6	2	0	22	2	39	5	0	46	7	6	4	0	17	1	47	7	0	55	140	
8:45 AM	9	6	6	0	21	1	69	9	0	79	7	3	2	0	12	2	46	11	0	59	171	
9:00 AM	4	2	3	0	9	7	45	4	0	56	10	3	1	0	14	5	39	5	0	49	128	0
9:15 AM	2	3	4	0	9	1	47	4	0	52	5	5	0	0	10	1	44	7	0	52	123	
9:30 AM	5	3	2	0	10	1	70	11	0	82	10	4	2	0	16	1	40	10	0	51	159	
9:45 AM	6	2	5	0	13	1	53	4	0	58	11	4	2	0	17	1	37	7	0	45	133	
10:00 AM	2	5	3	0	10	1	62	2	0	65	9	4	2	0	15	2	48	5	0	55	145	0
10:15 AM	2	1	5	0	8	1	52	7	0	60	10	4	3	0	17	1	35	9	0	45	130	
10:30 AM	2	6	5	0	13	3	49	6	0	58	6	6	0	0	12	6	34	10	0	50	133	
10:45 AM	8	5	4	0	17	5	47	7	0	59	9	3	2	0	14	2	53	17	0	72	162	
11:00 AM	1	1	0	0	2	1	52	3	0	56	5	4	2	0	11	4	48	10	0	62	131	0
11:15 AM	1	4	3	0	8	2	50	9	0	61	13	2	3	0	18	2	58	9	0	69	156	
11:30 AM	2	2	3	0	7	6	47	5	0	58	11	0	3	0	14	4	54	13	0	71	150	
11:45 AM	5	2	4	0	11	3	47	8	0	58	13	3	4	0	20	6	47	9	0	62	151	
Total	101	75	75	0	251	49	1182	165	1	1396	181	68	56	1	305	47	902	168	1	1117	3069	
App %	40.2	29.9	29.9			3.5	84.7	11.8			59.3	22.3	18.4			4.2	80.8	15				
Total %	3.3	2.4	2.4		8.2	1.6	38.5	5.4		45.5	5.9	2.2	1.8		9.9	1.5	29.4	5.5		36.4		

TRUCKS

NB					EB				SB				WB				
Start Time	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Interval Total
6:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
6:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
6:30 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0	2	4
6:45 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1	4
7:00 AM	1	0	0	1	0	3	0	3	0	0	1	1	0	1	0	1	6
7:15 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1	4
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
8:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
8:30 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	5	0	5	9
8:45 AM	0	0	0	0	1	4	0	5	0	0	1	1	0	4	0	4	10
9:00 AM	0	0	1	1	0	0	0	0	0	0	1	1	0	4	0	4	6
9:15 AM	1	0	0	1	0	6	0	6	0	0	1	1	0	6	0	6	14
9:30 AM	0	0	0	0	0	5	1	6	0	0	0	0	0	5	1	6	12
9:45 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0	2	4
10:00 AM	0	0	0	0	0	5	0	5	0	0	0	0	0	4	1	5	10
10:15 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	3	0	3	6
10:30 AM	0	0	0	0	0	8	0	8	1	0	0	1	0	3	2	5	14
10:45 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
11:00 AM	0	1	0	1	0	1	0	1	0	0	1	1	0	1	1	2	5
11:15 AM	0	0	0	0	0	5	0	5	0	0	1	1	0	1	0	1	7
11:30 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	5	0	5	8
11:45 AM	0	0	0	0	0	2	0	2	1	0	0	1	0	2	0	2	5
Total	3	1	1	5	1	63	1	65	3	0	6	9	1	59	5	65	144
App %	60	20	20		1.5	96.9	1.5		33.3	0	66.7		1.5	90.8	7.7		
Total %	2.1	0.7	0.7	3.5	0.7	43.8	0.7	45.1	2.1	0	4.2	6.3	0.7	41	3.5	45.1	

NOTES: 1. Peak hour data is shown in red or bold text.
2. 2012 data is used for signal warrant analysis.

Turning Movement Count Report - Cars + Trucks

INT ID	ROAD 1	ROAD 2	ROAD 3	ROAD 4	COMMUNITY	TMC DATE
30202825	RICE LN	VT-67A	SILK RD	VT-67A	BENNINGTON	7/10/2012

NB Start					App	EB				App	SB				App	WB				App	Interval		Hourly App Volume				Hourly Ped Volume
Time	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Total		NB	EB	SB	WB	NB
6:00 AM	1	1	0	0	2	0	15	0	0	15	1	0	1	0	2	1	18	2	1	21	40						
6:15 AM	1	1	1	0	3	0	29	6	1	35	5	0	4	1	9	1	16	1	0	18	65						
6:30 AM	4	1	0	0	5	0	51	4	0	55	3	1	7	0	11	0	35	2	0	37	108		18	160	29	110	3
6:45 AM	4	1	3	0	8	0	49	6	0	55	3	0	4	0	7	1	30	3	0	34	104	317					
7:00 AM	5	0	3	0	8	1	45	7	0	53	4	1	1	0	6	1	26	4	0	31	98	375					
7:15 AM	3	3	2	0	8	4	62	12	0	78	6	3	4	0	13	0	24	6	0	30	129	439					
7:30 AM	2	5	3	0	10	4	44	6	0	54	4	2	1	0	7	2	27	2	0	31	102	433	41	263	43	136	0
7:45 AM	7	3	5	0	15	1	59	18	0	78	10	3	4	0	17	1	35	8	0	44	154	483					
8:00 AM	5	3	6	0	14	3	55	12	0	70	13	5	0	0	18	0	31	4	0	35	137	522					
8:15 AM	8	9	3	0	20	1	57	10	0	68	7	2	1	0	10	3	41	7	0	51	149	542					
8:30 AM	14	6	2	0	22	2	43	5	0	50	7	6	4	0	17	1	52	7	0	60	149	589	77	272	58	209	0
8:45 AM	9	6	6	0	21	2	73	9	0	84	7	3	3	0	13	2	50	11	0	63	181	616					
9:00 AM	4	2	4	0	10	7	45	4	0	56	10	3	2	0	15	5	43	5	0	53	134	613					
9:15 AM	3	3	4	0	10	1	53	4	0	58	5	5	1	0	11	1	50	7	0	58	137	601					
9:30 AM	5	3	2	0	10	1	75	12	0	88	10	4	2	0	16	1	45	11	0	57	171	623	43	262	59	215	0
9:45 AM	6	2	5	0	13	1	55	4	0	60	11	4	2	0	17	1	39	7	0	47	137	579					
10:00 AM	2	5	3	0	10	1	67	2	0	70	9	4	2	0	15	2	52	6	0	60	155	600					
10:15 AM	2	1	5	0	8	1	55	7	0	63	10	4	3	0	17	1	38	9	0	48	136	599					
10:30 AM	2	6	5	0	13	3	57	6	0	66	7	6	0	0	13	6	37	12	0	55	147	575	48	260	59	238	0
10:45 AM	8	5	4	0	17	5	49	7	0	61	9	3	2	0	14	2	56	17	0	75	167	605					
11:00 AM	1	2	0	0	3	1	53	3	0	57	5	4	3	0	12	4	49	11	0	64	136	586					
11:15 AM	1	4	3	0	8	2	55	9	0	66	13	2	4	0	19	2	59	9	0	70	163	613					
11:30 AM	2	2	3	0	7	6	50	5	0	61	11	0	3	0	14	4	59	13	0	76	158	624	29	244	66	274	0
11:45 AM	5	2	4	0	11	3	49	8	0	60	14	3	4	0	21	6	49	9	0	64	156	613					
Total	104	76	76	0	256	50	1245	166	1	1461	184	68	62	1	314	48	961	173	1	1182	3213						
App %	40.6	29.7	29.7			3.4	85.2	11.4			58.6	21.7	19.7			4.1	81.3	14.6								
Total %	3.2	2.4	2.4		8	1.6	38.7	5.2		45.5	5.7	2.1	1.9		9.8	1.5	29.9	5.4		36.8						
HV %	3	1	1			2	5	1			2	0	10			2	6	3								

Peak Hour from 6:00 AM to 12:00 PM - 10:45 AM to 11:45 AM

INT ID	ROAD 1	ROAD 2	ROAD 3	ROAD 4	COMMUNITY	TMC DATE
30202825	RICE LN	VT-67A	SILK RD	VT-67A	BENNINGTON	7/10/2012

NB Start					App	EB				App	SB				App	WB				App	Interval
Time	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Total
10:45 AM	8	5	4	0	17	5	49	7	0	61	9	3	2	0	14	2	56	17	0	75	167
11:00 AM	1	2	0	0	3	1	53	3	0	57	5	4	3	0	12	4	49	11	0	64	136
11:15 AM	1	4	3	0	8	2	55	9	0	66	13	2	4	0	19	2	59	9	0	70	163
11:30 AM	2	2	3	0	7	6	50	5	0	61	11	0	3	0	14	4	59	13	0	76	158
Total	12	13	10	0	35	14	207	24	0	245	38	9	12	0	59	12	223	50	0	285	624
APP %	34.3	37.1	28.6			5.7	84.5	9.8			64.4	15.3	20.3			4.2	78.2	17.5			
HV	0	1	0		1	0	11	0		11	0	0	2		2	0	10	1		11	
HV %	0	7.69	0		2.86	0	5.31	0		4.49	0	0	16.7		3.39	0	4.48	2		3.86	

Peak Hour from 7:00 AM to 9:00 AM - 8:00 AM to 9:00 AM

INT ID	ROAD 1	ROAD 2	ROAD 3	ROAD 4	COMMUNITY	TMC DATE
30202825	RICE LN	VT-67A	SILK RD	VT-67A	BENNINGTON	7/10/2012

NB Start					App	EB				App	SB				App	WB				App	Interval
Time	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Total
8:00 AM	5	3	6	0	14	3	55	12	0	70	13	5	0	0	18	0	31	4	0	35	137
8:15 AM	8	9	3	0	20	1	57	10	0	68	7	2	1	0	10	3	41	7	0	51	149
8:30 AM	14	6	2	0	22	2	43	5	0	50	7	6	4	0	17	1	52	7	0	60	149
8:45 AM	9	6	6	0	21	2	73	9	0	84	7	3	3	0	13	2	50	11	0	63	181
Total	36	24	17	0	77	8	228	36	0	272	34	16	8	0	58	6	174	29	0	209	616
APP %	103	68.6	48.6			3.3	93.1	14.7			57.6	27.1	13.6			2.1	61.1	10.2			
HV	0	0	0		0	1	9	0		10	0	0	1		1	0	12	0		12	23
HV %	0	0	0		0	13	3.95	0		3.68	0	0	12.5		1.72	0	6.9	0		5.74	

Turning Movement Count Report - Cars & Trucks

INT ID	ROAD 1	ROAD 2	ROAD 3	ROAD 4	COMMUNITY	TMC DATE
30202825	RICE LN	VT-67A	SILK RD	VT-67A	BENNINGTON	7/9/2012

CARS

NB					EB					SB					WB						
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Interval Total	PEDS
12:00 PM	5	6	5	0	16	4	49	7	0	60	7	4	4	0	15	7	70	19	1	96	187	3
12:15 PM	8	5	3	0	16	1	69	6	0	76	14	1	6	0	21	3	77	9	0	89	202	
12:30 PM	6	5	12	0	23	2	56	6	0	64	11	5	3	0	19	3	60	17	1	80	186	
12:45 PM	5	2	7	0	14	6	59	9	1	74	9	3	1	0	13	2	60	16	0	78	179	
1:00 PM	7	9	4	0	20	0	55	8	0	63	7	2	1	0	10	11	65	6	0	82	175	1
1:15 PM	4	2	2	0	8	5	61	9	0	75	8	3	1	0	12	5	44	11	0	60	155	
1:30 PM	5	1	3	0	9	2	40	3	0	45	11	6	5	0	22	4	55	21	0	80	156	
1:45 PM	6	3	4	0	13	0	67	2	0	69	14	1	4	0	19	3	61	8	1	72	173	
2:00 PM	9	2	7	0	18	1	53	7	0	61	12	4	0	0	16	5	57	8	1	70	165	1
2:15 PM	2	5	4	0	11	5	62	4	0	71	6	3	3	0	12	3	49	9	0	61	155	
2:30 PM	5	8	2	0	15	3	80	12	0	95	5	6	3	0	14	3	77	16	0	96	220	
2:45 PM	7	2	3	0	12	4	50	6	0	60	7	4	4	0	15	6	65	20	0	91	178	
3:00 PM	4	3	6	0	13	6	54	7	0	67	5	5	4	0	14	4	71	12	0	87	181	2
3:15 PM	6	5	3	0	14	4	62	5	0	71	8	2	1	0	11	5	76	13	0	94	190	
3:30 PM	**6**	**2**	**9**	**0**	**17**	**5**	**98**	**8**	**0**	**111**	**17**	**7**	**3**	**0**	**27**	**6**	**84**	**12**	**0**	**102**	**257**	
3:45 PM	**7**	**6**	**4**	**0**	**17**	**7**	**71**	**7**	**0**	**85**	**11**	**9**	**2**	**2**	**22**	**4**	**71**	**19**	**0**	**94**	**218**	
4:00 PM	**8**	**6**	**6**	**0**	**20**	**5**	**79**	**12**	**0**	**96**	**13**	**5**	**3**	**2**	**21**	**4**	**83**	**9**	**0**	**96**	**233**	4
4:15 PM	**12**	**6**	**9**	**0**	**27**	**3**	**73**	**4**	**0**	**80**	**12**	**4**	**2**	**0**	**18**	**3**	**69**	**24**	**1**	**96**	**221**	
4:30 PM	8	5	12	0	25	3	59	2	0	64	11	4	2	0	17	8	74	19	0	101	207	
4:45 PM	5	5	16	1	26	2	49	1	0	52	10	4	2	0	16	11	76	13	0	100	194	
5:00 PM	13	6	2	0	21	3	68	6	0	77	13	2	7	0	22	4	84	17	0	105	225	1
5:15 PM	8	5	5	0	18	1	58	9	1	68	10	4	2	0	16	8	83	16	0	107	209	
5:30 PM	10	4	4	0	18	3	55	9	0	67	12	6	3	0	21	3	73	21	0	97	203	
5:45 PM	1	3	3	0	7	0	55	2	0	57	9	3	2	0	14	7	62	11	0	80	158	
Total	157	106	135	1	398	75	1482	151	2	1708	242	97	68	4	407	122	1646	346	5	2114	4627	
App %	39.4	26.6	33.9			4.4	86.8	8.8			59.5	23.8	16.7			5.8	77.9	16.4				
Total %	3.4	2.3	2.9		8.6	1.6	32	3.3		36.9	5.2	2.1	1.5		8.8	2.6	35.6	7.5		45.7		

TRUCKS

NB					EB				SB				WB					
Start Time	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Left	Thru	Right	App Total	Interval Total	
12:00 PM	0	1	0	1	0	3	0	3	0	0	0	0	0	1	0	1	5	
12:15 PM	0	0	0	0	0	4	0	4	1	0	0	1	0	3	1	4	9	
12:30 PM	0	0	0	0	0	4	0	4	1	0	0	1	0	3	1	4	9	
12:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5	
1:00 PM	0	0	0	0	0	6	0	6	1	0	0	1	0	4	0	4	11	
1:15 PM	0	0	0	0	0	3	1	4	0	1	0	1	0	2	0	2	7	
1:30 PM	0	0	0	0	1	4	0	5	0	0	0	0	0	5	0	5	10	
1:45 PM	0	0	0	0	0	3	0	3	1	0	0	1	0	2	1	3	7	
2:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2	
2:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3	4	
2:30 PM	0	0	0	0	1	1	0	2	0	0	0	0	0	4	0	4	6	
2:45 PM	0	0	0	0	0	3	1	4	0	0	0	0	0	4	1	5	9	
3:00 PM	0	0	0	0	0	1	0	1	1	0	1	2	0	0	0	0	3	
3:15 PM	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	3	
3:30 PM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**4**	**0**	**0**	**1**	**1**	**0**	**5**	**0**	**5**	**10**	
3:45 PM	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**3**	**8**	
4:00 PM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**4**	
4:15 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**3**	
4:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2	
4:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3	4	
5:00 PM	0	1	0	1	0	2	0	2	1	0	0	1	0	0	0	0	4	
5:15 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3	
5:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2	
5:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	
Total	0	2	0	2	2	58	2	62	7	1	3	11	0	52	4	56	131	
App %	0	100	0		3.2	93.5	3.2		63.6	9.1	27.3		0	92.9	7.1			
Total %	0	1.5	0	1.5	1.5	44.3	1.5	47.3	5.3	0.8	2.3	8.4	0	39.7	3.1	42.7		

NOTES: 1. Peak hour data is shown in red or bold text.
2. 2012 data is used for signal warrant analysis.

Turning Movement Count Report - Cars + Trucks

INT ID	ROAD 1	ROAD 2	ROAD 3	ROAD 4	COMMUNITY	TMC DATE
30202825	RICE LN	VT-67A	SILK RD	VT-67A	BENNINGTON	7/9/2012

NB						EB						SB						WB							
Start					App					App					App					App	Interval	
Time	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Total	
12:00 PM	5	7	5	0	17	4	52	7	0	63	7	4	4	0	15	7	71	19	1	97	192	
12:15 PM	8	5	3	0	16	1	73	6	0	80	15	1	6	0	22	3	80	10	0	93	211	
12:30 PM	6	5	12	0	23	2	60	6	0	68	12	5	3	0	20	3	63	18	1	84	195	
12:45 PM	5	2	7	0	14	6	61	9	1	76	9	3	1	0	13	2	63	16	0	81	184	782
1:00 PM	7	9	4	0	20	0	61	8	0	69	8	2	1	0	11	11	69	6	0	86	186	776
1:15 PM	4	2	2	0	8	5	64	10	0	79	8	4	1	0	13	5	46	11	0	62	162	727
1:30 PM	5	1	3	0	9	3	44	3	0	50	11	6	5	0	22	4	60	21	0	85	166	698
1:45 PM	6	3	4	0	13	0	70	2	0	72	15	1	4	0	20	3	63	9	1	75	180	694
2:00 PM	9	2	7	0	18	1	54	7	0	62	12	4	0	0	16	5	58	8	1	71	167	675
2:15 PM	2	5	4	0	11	5	63	4	0	72	6	3	3	0	12	3	52	9	0	64	159	672
2:30 PM	5	8	2	0	15	4	81	12	0	97	5	6	3	0	14	3	81	16	0	100	226	732
2:45 PM	7	2	3	0	12	4	53	7	0	64	7	4	4	0	15	6	69	21	0	96	187	739
3:00 PM	4	3	6	0	13	6	55	7	0	68	6	5	5	0	16	4	71	12	0	87	184	756
3:15 PM	6	5	3	0	14	4	63	5	0	72	8	2	2	0	12	5	77	13	0	95	193	790
3:30 PM	6	2	9	0	17	5	102	8	0	115	17	7	4	0	28	6	89	12	0	107	267	831
3:45 PM	7	6	4	0	17	7	76	7	0	90	11	9	2	2	22	4	74	19	0	97	226	870
4:00 PM	8	6	6	0	20	5	81	12	0	98	14	5	3	2	22	4	84	9	0	97	237	923
4:15 PM	12	6	9	0	27	3	74	4	0	81	12	4	2	0	18	3	71	24	1	98	224	954
4:30 PM	8	5	12	0	25	3	60	2	0	65	11	4	2	0	17	8	75	19	0	102	209	896
4:45 PM	5	5	16	1	26	2	50	1	0	53	10	4	2	0	16	11	79	13	0	103	198	868
5:00 PM	13	7	2	0	22	3	70	6	0	79	14	2	7	0	23	4	84	17	0	105	229	860
5:15 PM	8	5	5	0	18	1	61	9	1	71	10	4	2	0	16	8	83	16	0	107	212	848
5:30 PM	10	4	4	0	18	3	56	9	0	68	12	6	3	0	21	3	74	21	0	98	205	844
5:45 PM	1	3	3	0	7	0	56	2	0	58	9	3	2	0	14	7	62	11	0	80	159	805
Total	157	108	135	1	400	77	1540	153	2	1770	249	98	71	4	418	122	1698	350	5	2170	4758	
App %	39.3	27	33.8			4.4	87	8.6			59.6	23.4	17			5.6	78.2	16.1				
Total %	3.3	2.3	2.8		8.4	1.6	32.4	3.2		37.2	5.2	2.1	1.5		8.8	2.6	35.7	7.4		45.6		
HV %	0	2	0			3	4	1			3	1	4			0	3	1				

Hourly App Volume

NB	EB	SB	WB
70	287	70	355
50	270	66	308
56	295	57	331
61	345	78	386
98	297	73	400
65	276	74	390

Hourly Ped Volume

NB
3
1
1
2
4
1

Peak Hour from 12:00 PM to 6:00 PM - 3:30 PM to 4:30 PM

INT ID	ROAD 1	ROAD 2	ROAD 3	ROAD 4	COMMUNITY	TMC DATE
30202825	RICE LN	VT-67A	SILK RD	VT-67A	BENNINGTON	7/10/2012

NB						EB						SB						WB							
Start					App					App					App					App	Interval	
Time	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Total	
3:30 PM	6	2	9	0	17	5	102	8	0	115	17	7	4	0	28	6	89	12	0	107	267	267
3:45 PM	7	6	4	0	17	7	76	7	0	90	11	9	2	2	22	4	74	19	0	97	226	493
4:00 PM	8	6	6	0	20	5	81	12	0	98	14	5	3	2	22	4	84	9	0	97	237	730
4:15 PM	12	6	9	0	27	3	74	4	0	81	12	4	2	0	18	3	71	24	1	98	224	954
Total	33	20	28	0	81	20	333	31	0	384	54	25	11	4	90	17	318	64	1	399	954	
APP %	40.7	24.7	34.6			5.2	86.7	8.07			60	27.8	12.2			4.3	79.7	16				
HV	0	0	0		0	0	12	0		12	1	0	1		2	0	7	0		7		
HV %	0	0	0		0	0	3.6	0		3.13	1.85	0	9.09		2.22	0	2.2	0		1.75		

Peak Hour from 4:00 PM to 6:00 PM - 4:00 PM to 5:00 PM

INT ID	ROAD 1	ROAD 2	ROAD 3	ROAD 4	COMMUNITY	TMC DATE
30202825	RICE LN	VT-67A	SILK RD	VT-67A	BENNINGTON	7/10/2012

NB						EB						SB						WB							
Start					App					App					App					App	Interval	
Time	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Left	Thru	Right	Ped	Total	Total	
4:00 PM	8	6	6	0	20	5	81	12	0	98	14	5	3	2	22	4	84	9	0	97	237	237
4:15 PM	12	6	9	0	27	3	74	4	0	81	12	4	2	0	18	3	71	24	1	98	224	461
4:30 PM	8	5	12	0	25	3	60	2	0	65	11	4	2	0	17	8	75	19	0	102	209	670
4:45 PM	5	5	16	1	26	2	50	1	0	53	10	4	2	0	16	11	79	13	0	103	198	868
Total	33	22	43	1	98	13	265	19	0	297	47	17	9	2	73	26	309	65	1	400	868	
APP %	40.7	27.2	53.1			3.4	69	4.95			52.2	18.9	10			6.5	77.4	16.3				
HV	0	0	0		0	0	5	0		5	1	0	0		1	0	7	0		7	13	
HV %	0	0	0		0	0	1.89	0		1.68	2.13	0	0		1.37	0	2.27	0		1.75		

File Name : N Bennington Road (Rt 67A) at College Drive and Rice Lane/Silk Road
Site Code : 00000
Start Date : 02/28/2019
Page No. : 1

All vehicles

	College Drive					RiceLane					Silk Road					Rt 67A/ N Bennington Road						Rt 67A/ N Bennington Road							
	Southeast					Southbound					Northbound					Westbound						Eastbound							
Start Time	Left	Thru	Right	Bike/Pe	App. Total	Left	Thru	Right	Bike/Pe	App. Total	Left	Thru	Right	Bike/Pe	App. total	Left	Thru	Right	Right 2	Bike/Pe	App. total	Left	Left 2	Thru	Right	Bike/Pe	App. total	Int. Total	Hourly Volumes
8:00 AM	6	0	2	0	8	5	0	0	0	5	1	1	2	0	4	1	32	4	5	0	42	1	0	64	3	0	68	127	
8:15 AM	2	0	0	0	2	4	3	2	0	9	0	3	2	0	5	1	45	3	11	0	60	0	0	47	3	0	50	126	
8:30 AM	0	0	2	0	2	6	8	3	0	17	5	0	2	0	7	1	34	3	11	0	49	1	0	69	4	0	74	149	
8:45 AM	5	0	0	0	5	6	6	1	0	13	5	5	4	0	14	0	36	9	17	0	62	6	3	59	6	0	74	168	570
BREAK																													
4:00 PM	10	0	1	0	11	8	5	4	0	17	7	8	7	0	22	5	71	12	3	0	91	5	6	62	2	0	75	216	
4:15 PM	15	0	0	0	15	8	3	3	0	14	4	9	6	2	19	4	77	20	4	0	105	2	2	77	4	0	85	238	
4:30 PM	16	0	1	0	17	17	6	2	0	25	10	7	6	0	23	2	84	14	4	0	104	0	4	74	2	0	80	249	
4:45 PM	15	0	2	0	17	6	4	2	0	12	8	7	2	0	17	5	92	21	8	0	126	1	1	78	9	0	89	261	964
5:00 PM	23	0	4	0	27	5	2	3	0	10	7	5	5	0	17	7	83	21	11	0	122	1	3	61	7	0	72	248	996
5:15 PM	14	0	1	0	15	10	3	0	0	13	3	2	5	0	10	4	94	12	6	0	116	2	1	75	6	0	84	238	996
5:30 PM	6	0	1	0	7	14	2	5	0	21	7	7	6	0	20	7	70	15	6	0	98	0	0	67	3	0	70	216	963
5:45 PM	11	0	1	0	12	11	5	1	0	17	4	3	2	0	9	4	82	19	5	0	110	0	2	66	2	0	70	218	920

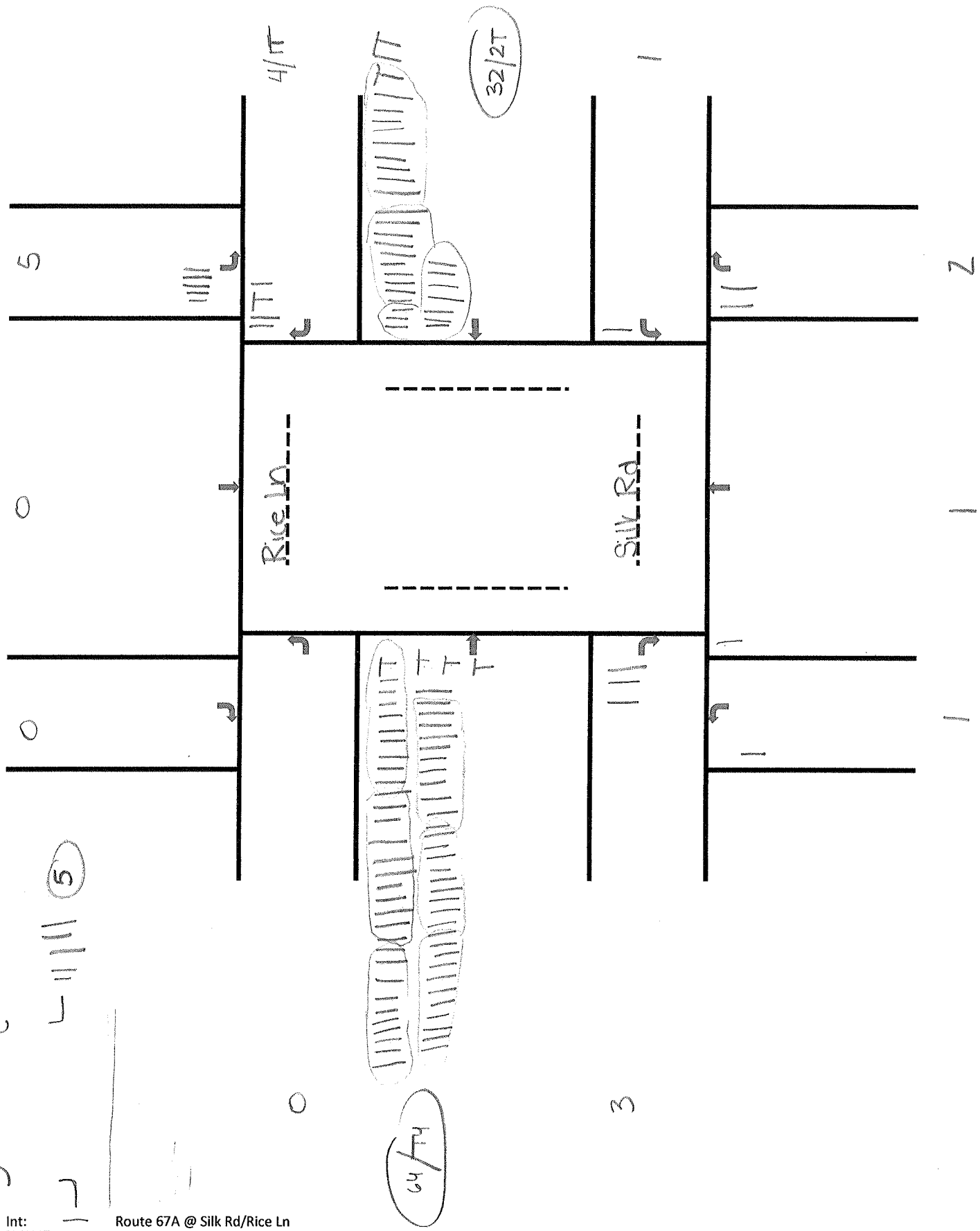
Westbound Right - N Bennington Rd to Rice Ln
Westbound Right 2 - N Bennington Rd to College Dr
Eastbound Left - N Bennington Rd to College Dr
Eastbound Left 2 - N Bennington Rd to Rice Ln

NOTE: 2019 data is used for traffic operations analysis.

File Name : N Bennington Road (Rt 67A) at College Drive and Rice Lane/Silk Road
Site Code : 00000
Start Date : 02/28/2019

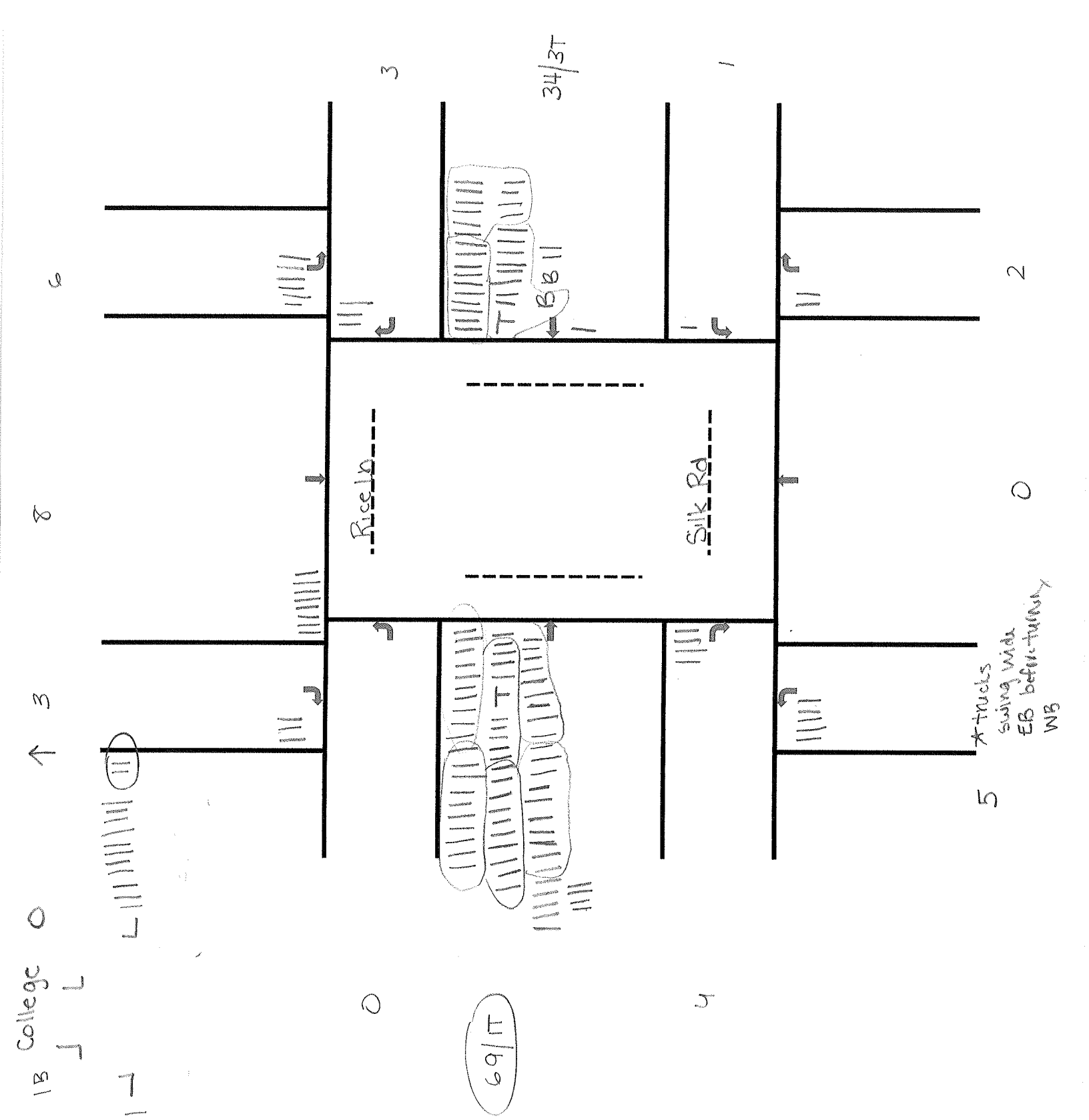
All vehicles

	College Drive					RiceLane					Silk Road					Rt 67A/ N Bennington Road						Rt 67A/ N Bennington Road						
	Southeast					Southbound					Northbound					Westbound						Eastbound						
Start Time	Left	Thru	Right	Bike/Pe	App. Total	Left	Thru	Right	Bike/Pe	App. Total	Left	Thru	Right	Bike/Pe	App. total	Left	Thru	Right	Right 2	Bike/Pe	App. total	Left	Left 2	Thru	Right	Bike/Pe	App. total	Int. Total
Peak Hour For Entire Intersection Begins at 7:15 AM																												
8:00 AM	6	0	2	0	8	5	0	0	0	5	1	1	2	0	4	1	32	4	5	0	42	1	0	64	3	0	68	127
8:15 AM	2	0	0	0	2	4	3	2	0	9	0	3	2	0	5	1	45	3	11	0	60	0	0	47	3	0	50	126
8:30 AM	0	0	2	0	2	6	8	3	0	17	5	0	2	0	7	1	34	3	11	0	49	1	0	69	4	0	74	149
8:45 AM	5	0	0	0	5	6	6	1	0	13	5	5	4	0	14	0	36	9	17	0	62	6	3	59	6	0	74	168
Total	13	0	4	0	17	21	17	6	0	44	11	9	10	0	30	3	147	19	44	0	213	8	3	239	16	0	266	570
PHF	0.542	0.000	0.500	0.000	0.531	0.875	0.531	0.500	0.000	0.647	0.550	0.450	0.625	0.000	0.536	0.750	0.817	0.528	0.647	0.000	0.859	0.333	0.250	0.866	0.667	0.000	0.899	0.848
BREAK																												
Peak Hour For Entire Intersection Begins at 4:30 PM																												
4:30 PM	16	0	1	0	17	17	6	2	0	25	10	7	6	0	23	2	84	14	4	0	104	0	4	74	2	0	80	249
4:45 PM	15	0	2	0	17	6	4	2	0	12	8	7	2	0	17	5	92	21	8	0	126	1	1	78	9	0	89	261
5:00 PM	23	0	4	0	27	5	2	3	0	10	7	5	5	0	17	7	83	21	11	0	122	1	3	61	7	0	72	248
5:15 PM	14	0	1	0	15	10	3	0	0	13	3	2	5	0	10	4	94	12	6	0	116	2	1	75	6	0	84	238
Total	68	0	8	0	76	38	15	7	0	60	28	21	18	0	67	18	353	68	29	0	468	4	9	288	24	0	325	996
PHF	0.739	0.000	0.500	0.000	0.704	0.559	0.625	0.583	0.000	0.600	0.700	0.750	0.750	0.000	0.728	0.643	0.939	0.810	0.659	0.000	0.929	0.500	0.563	0.923	0.667	0.000	0.913	0.954

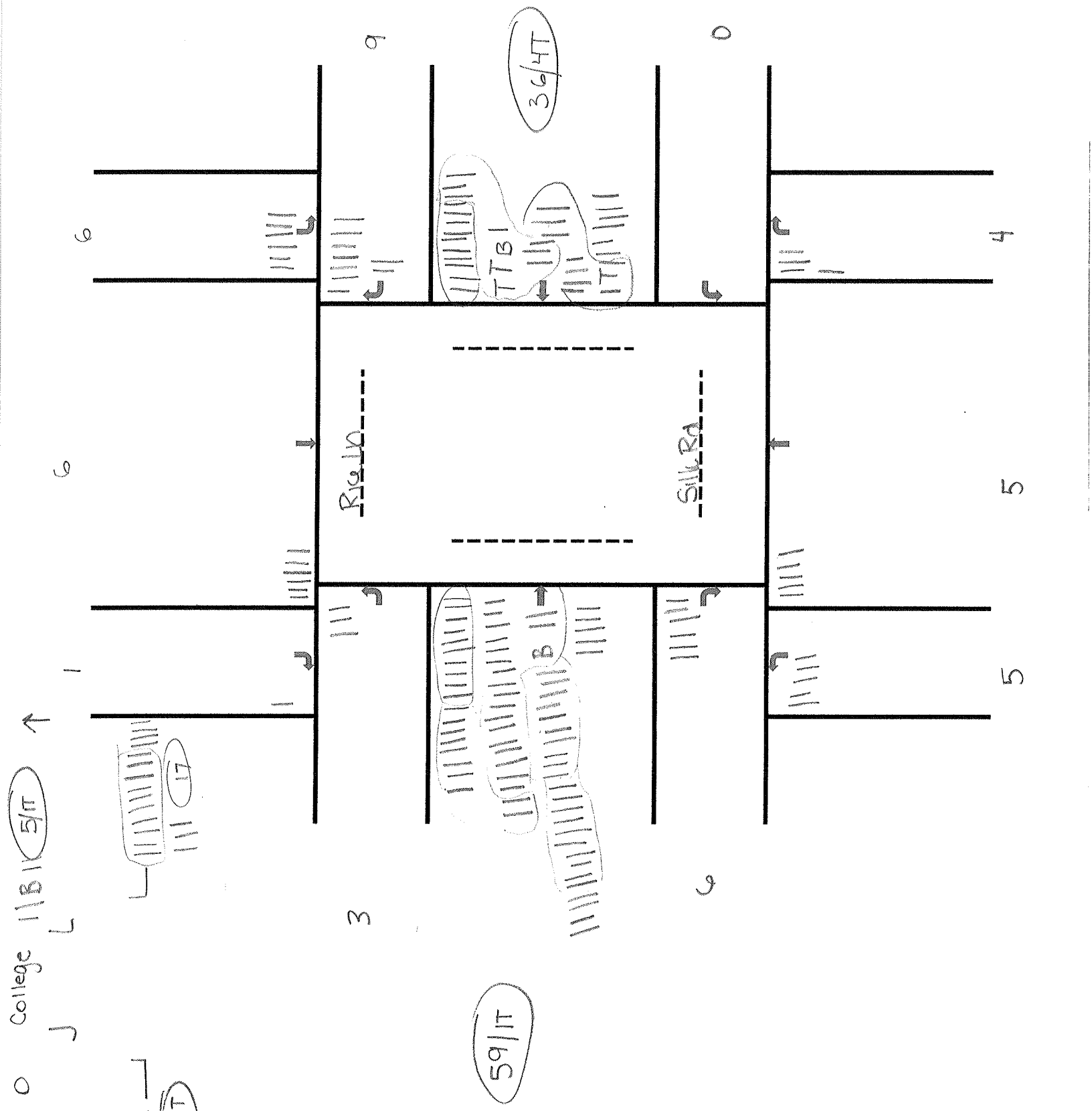


Int: Route 67A @ Silk Rd/Rice Ln
Time: 8:00 AM 8:15 AM
Date: Thursday, February 28, 2019
Name: ADALLY

Int: Route 67A @ Silk Rd/Rice Ln
Time: 8:15 AM 8:30 AM
Date: Thursday, February 28, 2019
Name: ADALLY



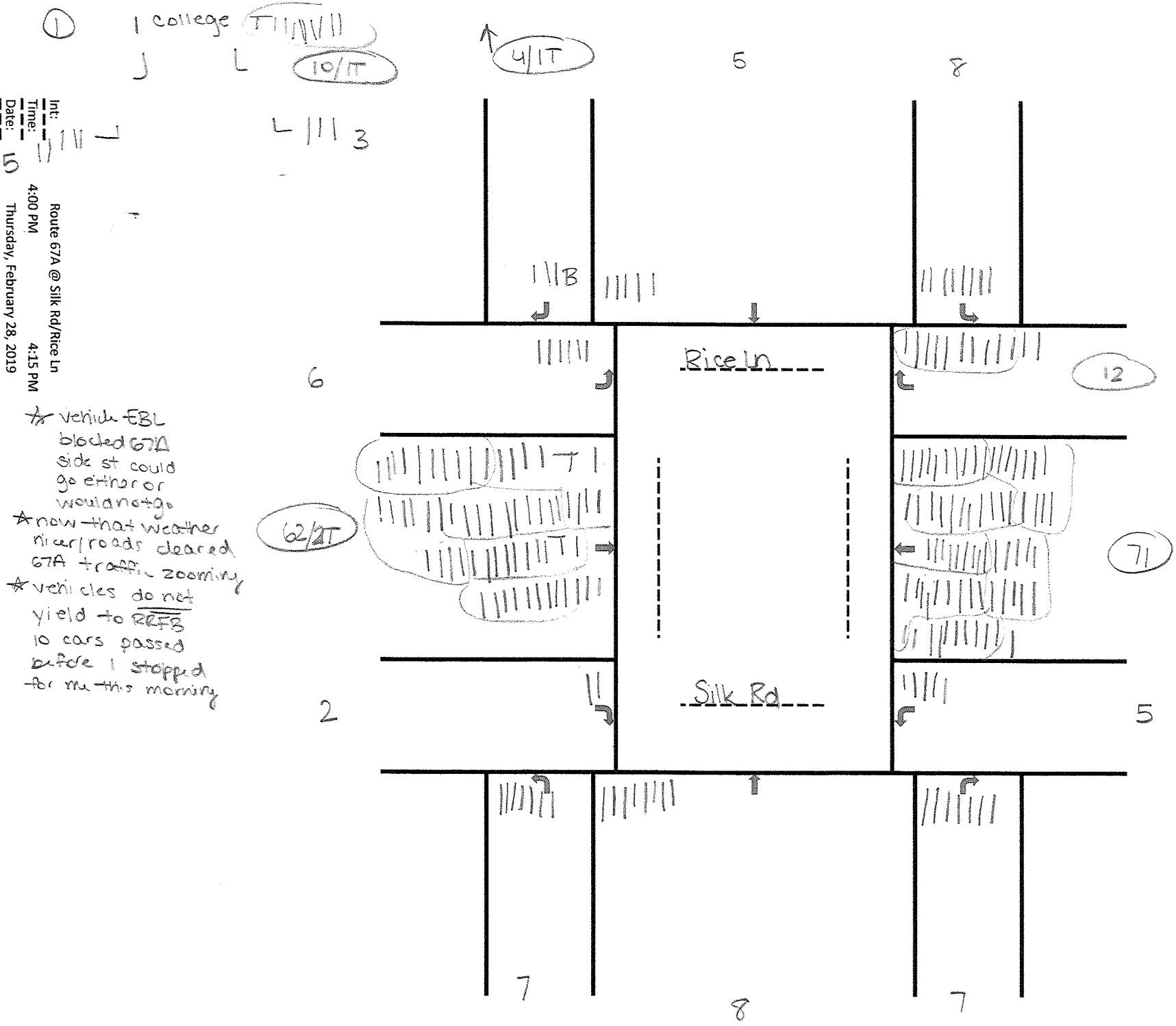
Int:	Route 67A @ Silk Rd/Rice Ln
Time:	8:30 AM 8:45 AM
Date:	Thursday, February 28, 2019
Name:	ADALLY



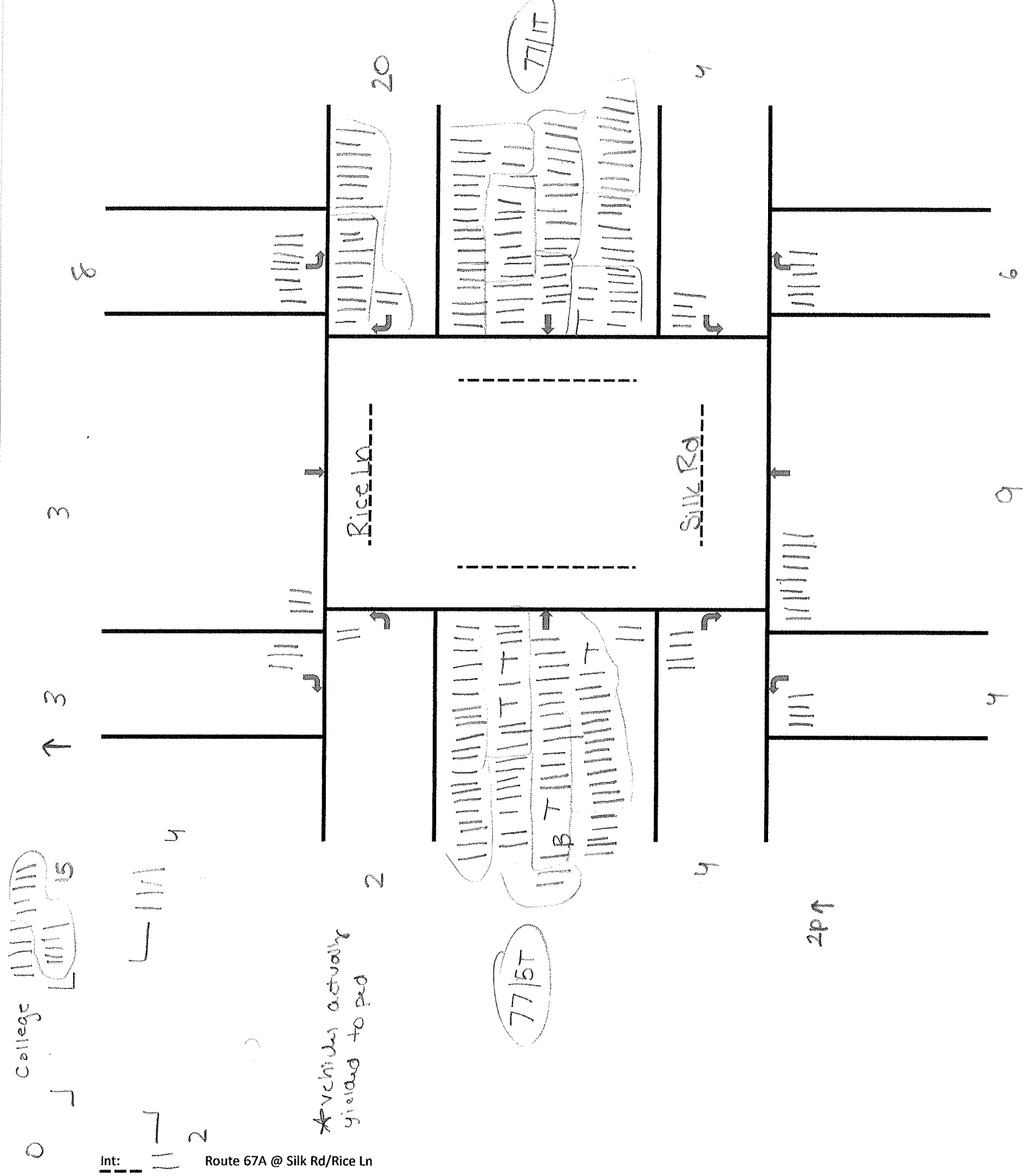
Int:	Route 67A @ Silk Rd/Rice Ln
Time:	8:45 AM 9:00 AM
Date:	Thursday, February 28, 2019
Name:	ADALLY

Int:
Time:
Date:
Name:

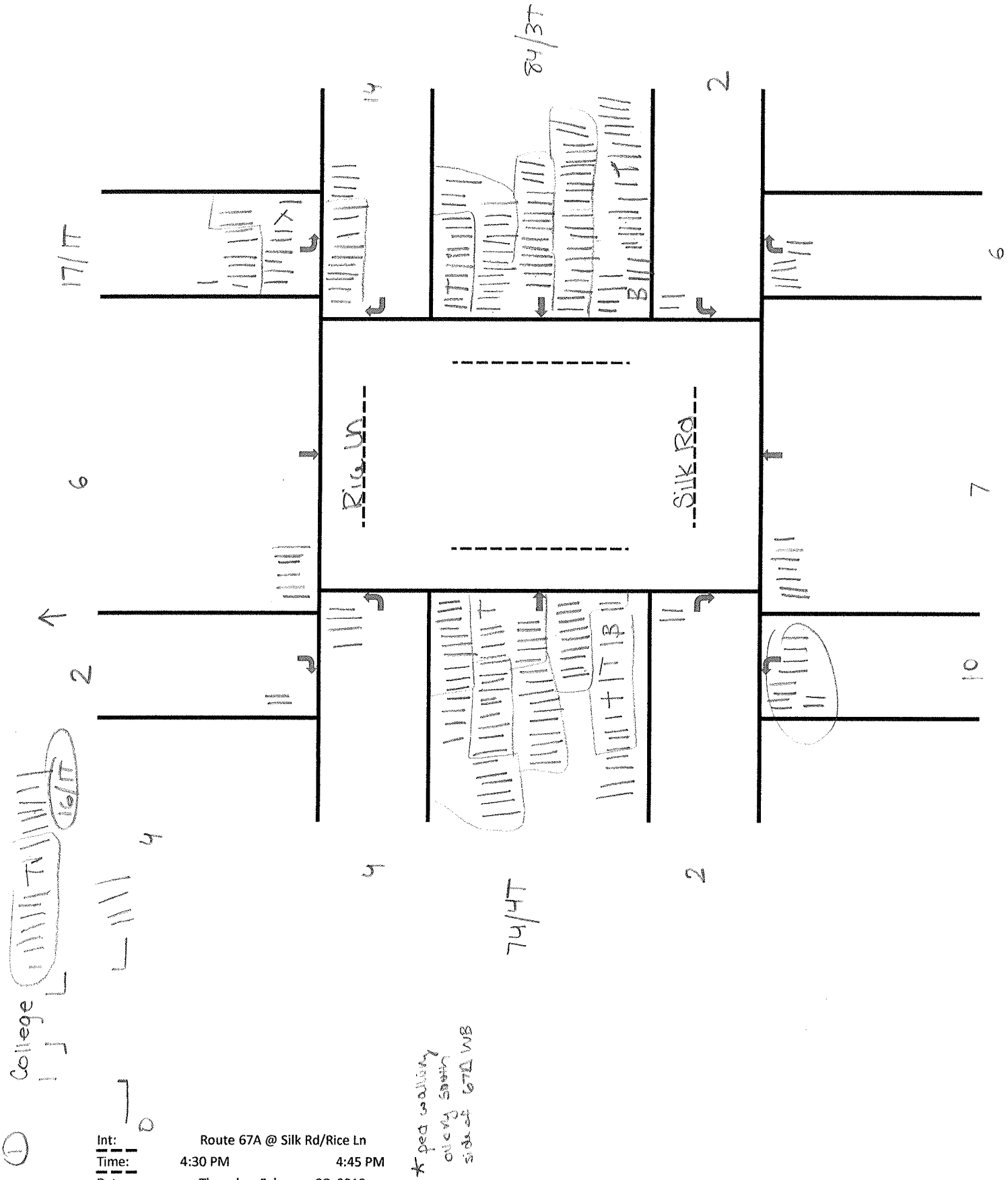
Route 67A @ Silk Rd/Rice Ln
4:00 PM
4:15 PM
Thursday, February 28, 2019
ADALLY



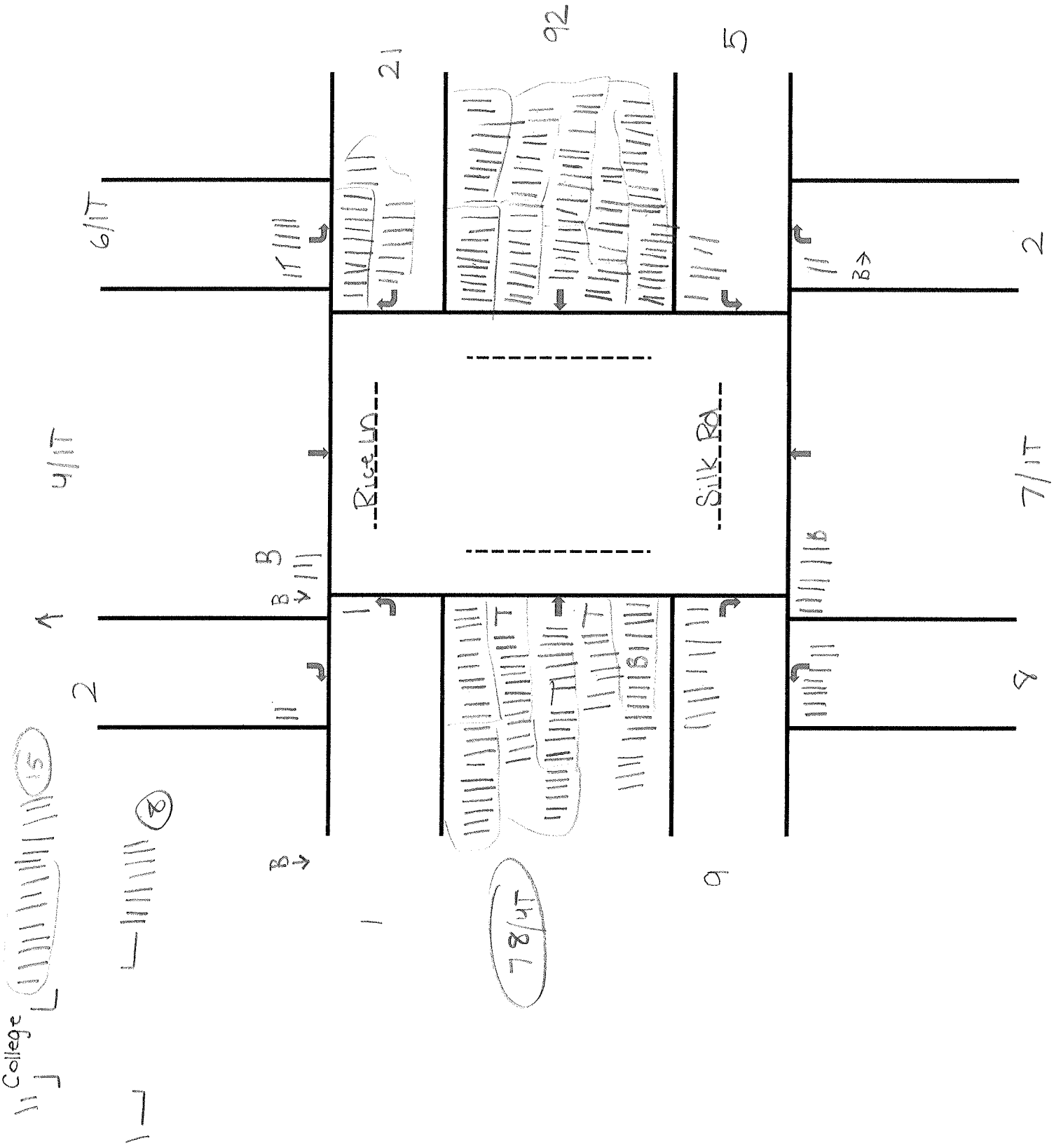
- ★ Vehicle EBL blocked 67A side st could go either or would not go.
- ★ now that weather nicer/roads cleared 67A traffic zooming
- ★ vehicles do not yield to RRFB 10 cars passed before I stopped for me this morning



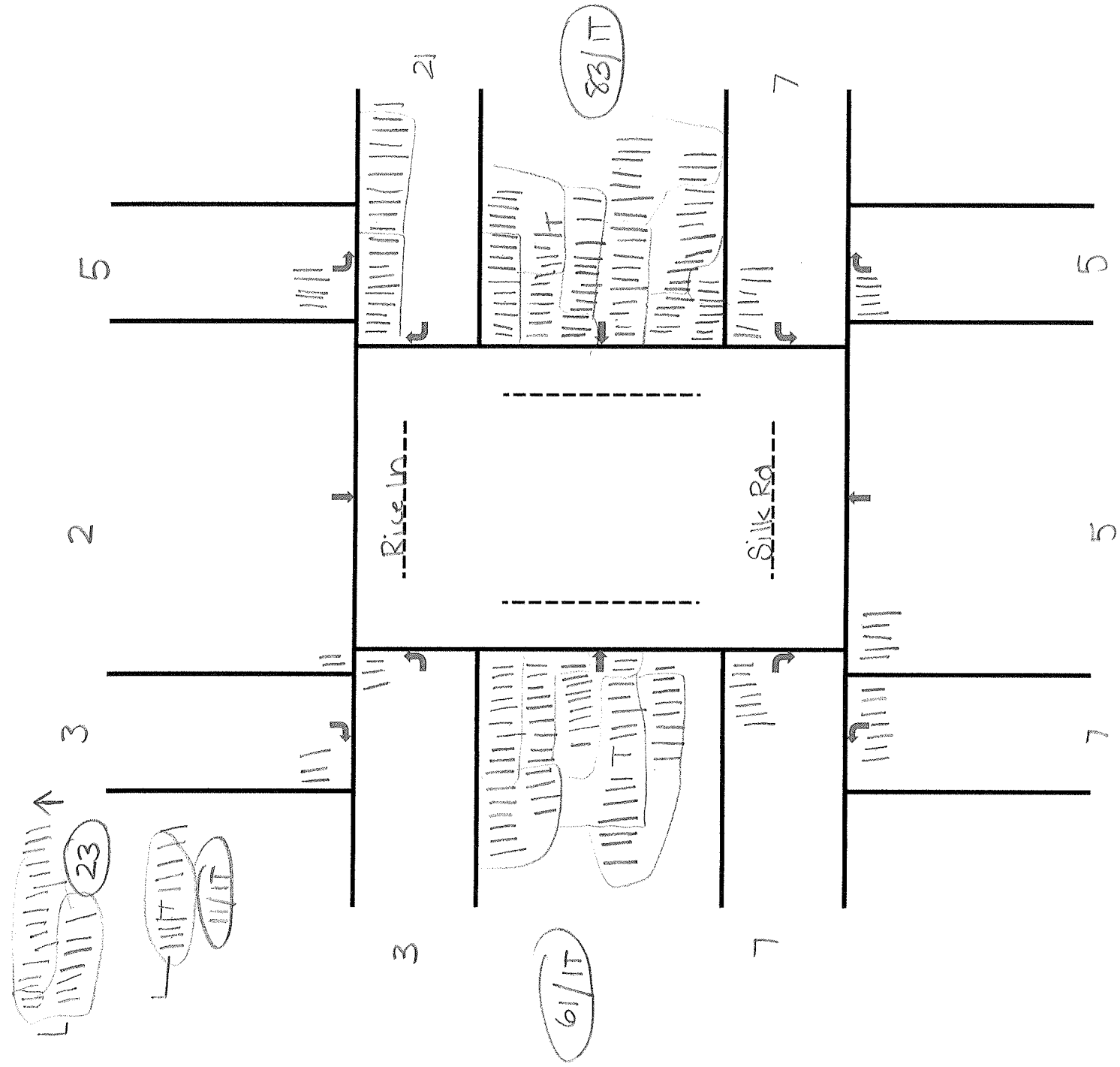
Int:	Route 67A @ Silk Rd/Rice Ln
Time:	4:15 PM 4:30 PM
Date:	Thursday, February 28, 2019
Name:	ADALLY



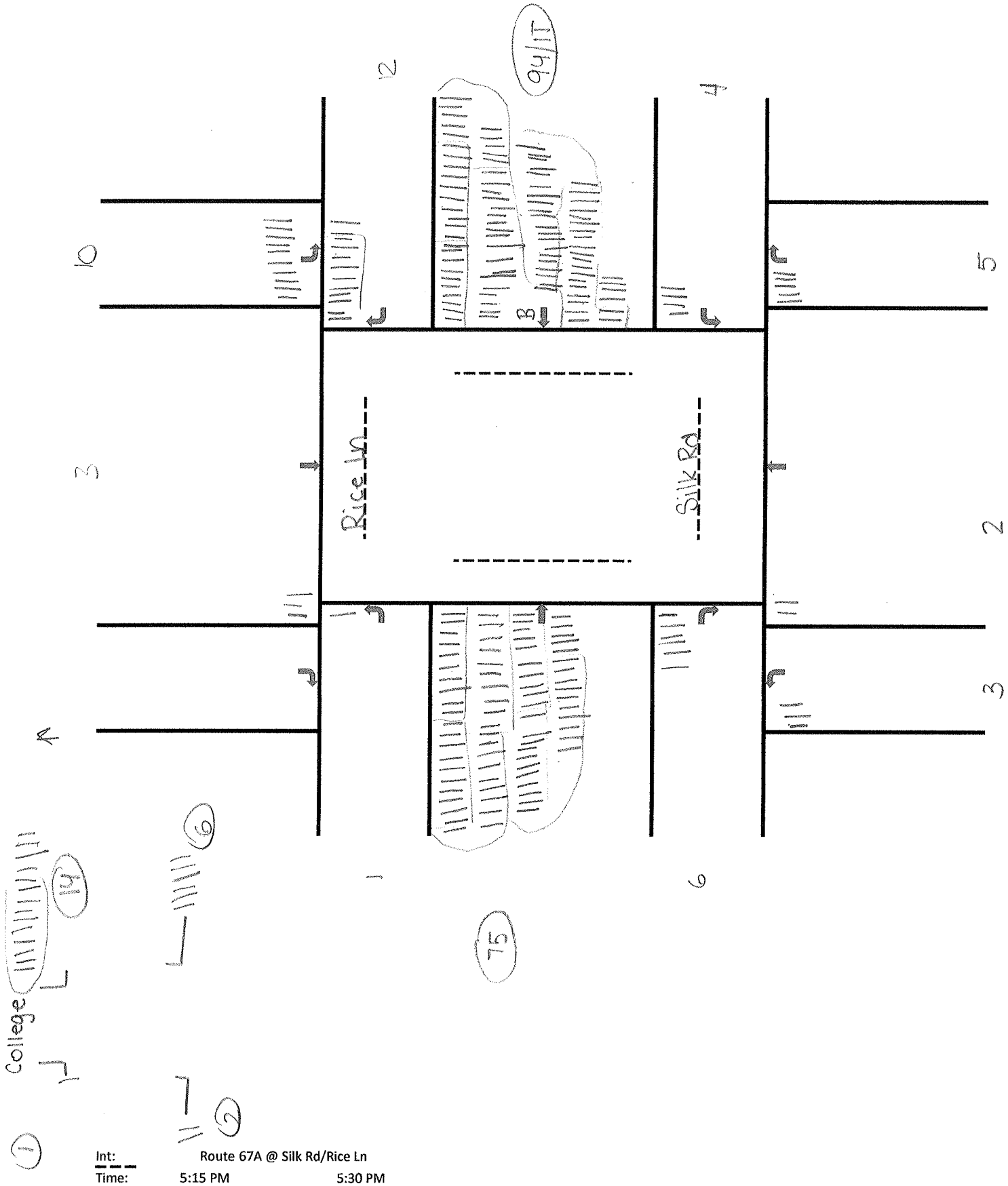
Int:	Route 67A @ Silk Rd/Rice Ln
Time:	4:30 PM 4:45 PM
Date:	Thursday, February 28, 2019
Name:	ADALLY



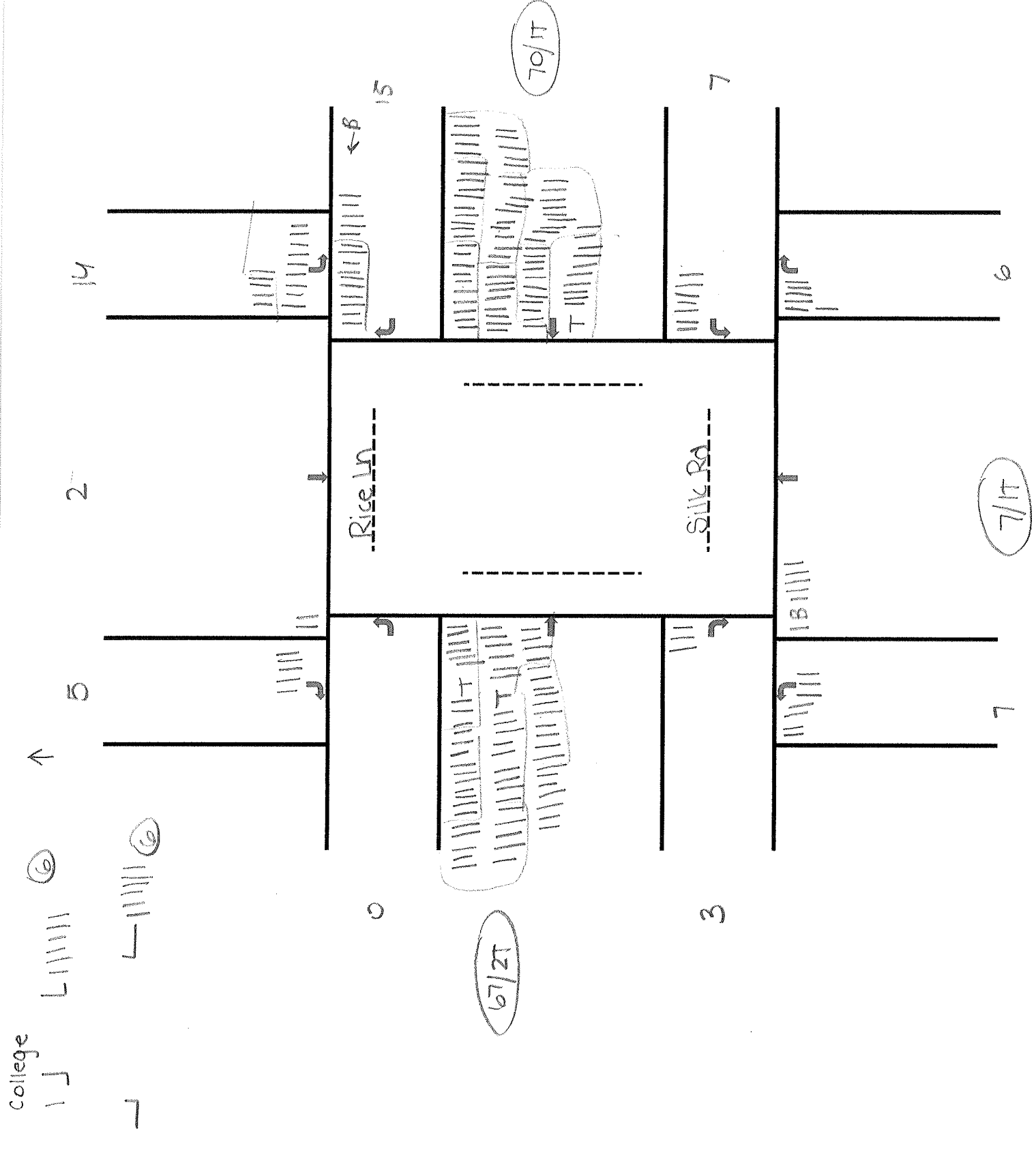
Int:	Route 67A @ Silk Rd/Rice Ln
Time:	4:45 PM 5:00 PM
Date:	Thursday, February 28, 2019
Name:	ADALLY



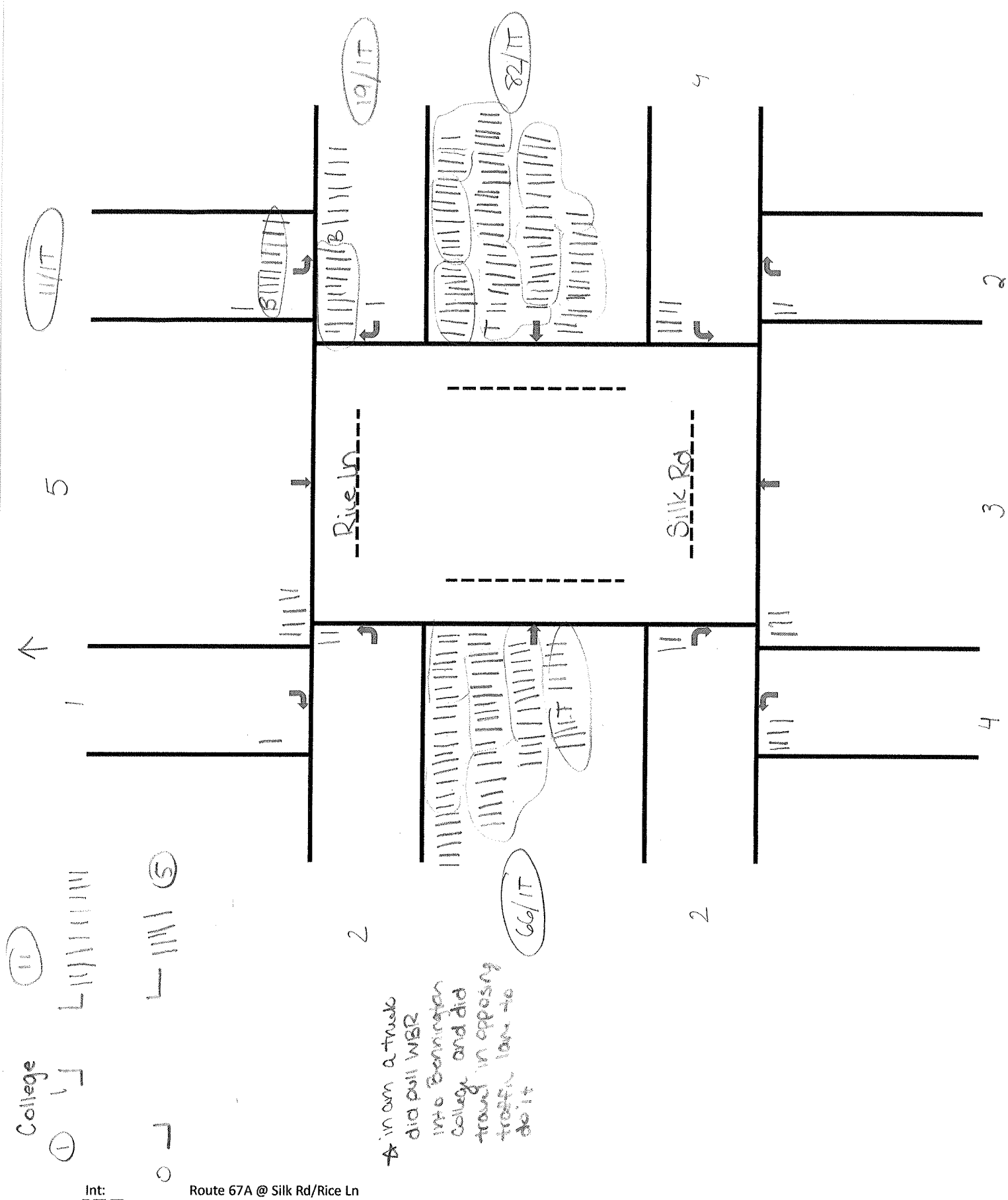
Int:	Route 67A @ Silk Rd/Rice Ln
Time:	5:00 PM 5:15 PM
Date:	Thursday, February 28, 2019
Name:	ADALLY



Int:	Route 67A @ Silk Rd/Rice Ln
Time:	5:15 PM 5:30 PM
Date:	Thursday, February 28, 2019
Name:	ADALLY



Int:	Route 67A @ Silk Rd/Rice Ln
Time:	5:30 PM 5:45 PM
Date:	Thursday, February 28, 2019
Name:	ADALLY



Int:	Route 67A @ Silk Rd/Rice Ln
Time:	5:45 PM 6:00 PM
Date:	Thursday, February 28, 2019
Name:	ADALLY

APPENDIX

A-2 *TRAFFIC VOLUMES*

VERMONT AGENCY OF TRANSPORTATION

MS2 Transportation Data Management System

List View | All DIRs

Record 285 of 430 Goto Record go

Location ID	B126	MPO ID	
Type	SPOT	HPMS ID	V067A001.062
On NHS	No	On HPMS	Yes
LRS ID	V067A0202	LRS Loc Pt.	1.155
SF Group	3	Route Type	
AF Group	U4	Route	VT67A
GF Group	2	Active	Yes
Class Dist Grp	U456	Category	
Seas Clss Grp	U4		
WIM Group			
QC Group	Default		
Fnct'l Class	Minor Arterial	Milepost	
Located On	North Bennington Rd		
Loc On Alias	VT67A		

PR	MP	PT
0		

More Detail

STATION DATA

Directions: 2-WAY | NB | SB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2018	7,099[3]		10	58	6,686 (94%)	412 (6%)	Grown from 2017
2017	7,120	704	10	58	6,706 (94%)	413 (6%)	
2016	7,512[3]						Grown from 2015
2015	7,408	711	10	57	6,856 (93%)	552 (7%)	
2014	7,000						

|<< < > >>| 1-5 of 22

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Tue 7/18/2017	15	7,817
	Mon 7/17/2017	15	7,609
	Sun 7/16/2017	15	6,255
	Sat 7/15/2017	15	6,739
	Fri 7/14/2017	15	8,103
	Thu 7/13/2017	15	7,767
	Mon 6/15/2015	15	7,307
	Sun 6/14/2015	15	6,597
	Sat 6/13/2015	15	7,690
	Fri 6/12/2015	15	8,707

|<< < > >>| 1-10 of 19

To Date

VOLUME TREND

Year	Annual Growth
2018	0%
2017	-5%
2016	1%
2015	6%
2014	-2%
2011	1%
2009	0%
2005	-3%
2002	-4%
2000	4%

|<< < > >>| 1-10 of 21

SPEED

	Date	Int	Pace	85th	Total
	Tue 7/18/2017	15	35 - 45	43	7,817

CLASSIFICATION

	Date	Int	Total
	Tue 7/18/2017	15	7,817

Peak Hour Traffic Volumes - Existing Conditions (Year 2019)

		Rice Lane			Silk Road			Rt 67A/ N Bennington Road			Rt 67A/ N Bennington Road		
		Southbound			Northbound			Westbound			Eastbound		
AM Peak 8:00 - 9:00	Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	8:00 AM	5	0	0	1	1	2	1	37	4	0	70	3
	8:15 AM	4	3	2	0	3	2	1	56	3	0	49	3
	8:30 AM	6	8	3	5	0	2	1	45	3	0	69	4
	8:45 AM	6	6	1	5	5	4	0	53	9	3	64	6

		College Road		Rt 67A/ N Bennington		Rt 67A/ N Bennington	
		Southbound		Westbound		Eastbound	
AM Peak 8:00 - 9:00	Start Time	Left	Right	Thru	Right	Left	Thru
	8:00 AM	6	2	33	5	1	67
	8:15 AM	2	0	47	11	0	50
	8:30 AM	0	2	42	11	1	73
	8:45 AM	5	0	42	17	6	68

		Rice Lane			Silk Road			Rt 67A/ N Bennington Road			Rt 67A/ N Bennington Road		
		Southbound			Northbound			Westbound			Eastbound		
PM Peak 4:30 - 5:30	Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	8:00 AM	17	6	2	10	7	6	2	88	14	4	90	2
	8:15 AM	6	4	2	8	7	2	5	100	21	1	93	9
	8:30 AM	5	2	3	7	5	5	7	94	21	3	84	7
	8:45 AM	10	3	0	3	2	5	4	100	12	1	89	6

		College Road		Rt 67A/ N Bennington		Rt 67A/ N Bennington	
		Southbound		Westbound		Eastbound	
PM Peak 4:30 - 5:30	Start Time	Left	Right	Thru	Right	Left	Thru
	8:00 AM	16	1	96	4	0	80
	8:15 AM	15	2	102	8	1	88
	8:30 AM	23	4	93	11	1	71
	8:45 AM	14	1	97	6	2	82

Peak Hour Traffic Volumes - No-Build Conditions (Year 2040)

		Rice Lane			Silk Road			Rt 67A/ N Bennington Road			Rt 67A/ N Bennington Road		
		Southbound			Northbound			Westbound			Eastbound		
AM Peak 8:00 - 9:00	Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	8:00 AM	5	0	0	1	1	2	1	40	4	0	75	3
	8:15 AM	4	3	2	0	3	2	1	61	3	0	53	3
	8:30 AM	6	9	3	5	0	2	1	49	3	0	75	4
	8:45 AM	6	6	1	5	5	4	0	57	10	3	69	6

		College Road		Rt 67A/ N Bennington		Rt 67A/ N Bennington	
		Southbound		Westbound		Eastbound	
AM Peak 8:00 - 9:00	Start Time	Left	Right	Thru	Right	Left	Thru
	8:00 AM	6	2	36	5	1	72
	8:15 AM	2	0	51	12	0	54
	8:30 AM	0	2	45	12	1	79
	8:45 AM	5	0	45	18	6	73

		Rice Lane			Silk Road			Rt 67A/ N Bennington Road			Rt 67A/ N Bennington Road		
		Southbound			Northbound			Westbound			Eastbound		
PM Peak 4:30 - 5:30	Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	8:00 AM	18	6	2	11	8	6	2	95	15	4	97	2
	8:15 AM	6	4	2	9	8	2	5	108	23	1	100	10
	8:30 AM	5	2	3	8	5	5	8	102	23	3	91	8
	8:45 AM	11	3	0	3	2	5	4	108	13	1	96	6

		College Road		Rt 67A/ N Bennington		Rt 67A/ N Bennington	
		Southbound		Westbound		Eastbound	
PM Peak 4:30 - 5:30	Start Time	Left	Right	Thru	Right	Left	Thru
	8:00 AM	17	1	104	4	0	86
	8:15 AM	16	2	110	9	1	95
	8:30 AM	25	4	101	12	1	77
	8:45 AM	15	1	105	6	2	88

Peak Hour Traffic Volumes - Build Conditions (Year 2040)

		College Drive			Rice Lane			Silk Road			Rt 67A/ N Bennington Road				Rt 67A/ N Bennington Road			
		Southeast			Southbound			Northbound			Westbound				Eastbound			
AM Peak 8:00 - 9:00	Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Right 2	Left	Left 2	Thru	Right
	8:00 AM	6	0	2	5	0	0	1	1	2	1	35	4	5	1	0	69	3
	8:15 AM	2	0	0	4	3	2	0	3	2	1	49	3	12	0	0	51	3
	8:30 AM	0	0	2	6	9	3	5	0	2	1	37	3	12	1	0	75	4
	8:45 AM	5	0	0	6	6	1	5	5	4	0	39	10	18	6	3	64	6

		College Drive			Rice Lane			Silk Road			Rt 67A/ N Bennington Road				Rt 67A/ N Bennington Road			
		Southeast			Southbound			Northbound			Westbound				Eastbound			
PM Peak 4:30 - 5:30	Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Right 2	Left	Left 2	Thru	Right
	4:30 PM	17	0	1	18	6	2	11	8	6	2	91	15	4	0	4	80	2
	4:45 PM	16	0	2	6	4	2	9	8	2	5	99	23	9	1	1	84	10
	5:00 PM	25	0	4	5	2	3	8	5	5	8	90	23	12	1	3	66	8
	5:15 PM	15	0	1	11	3	0	3	2	5	4	102	13	6	2	1	81	6

VT Route 67A		Rice Lane	
Projected AADT		Projected AADT	
2018	7099	2013	1900
2019	7124	2019	1940
2020	7149	2020	1947
2024	7250	2024	1975
2040	7669	2040	2089
Annual Growth Rate	0.35%		

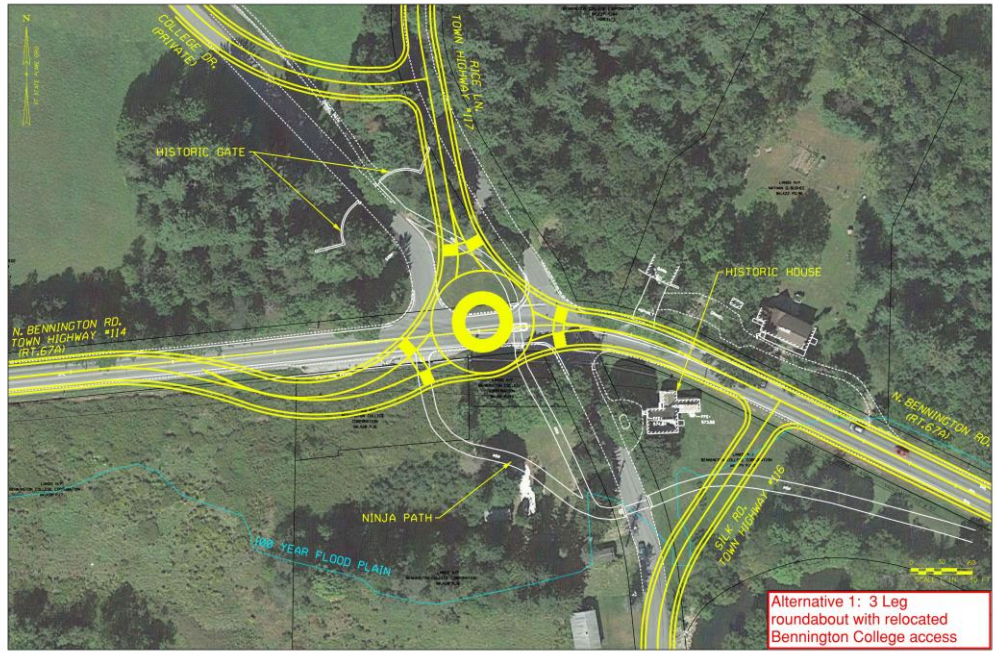
APPENDIX

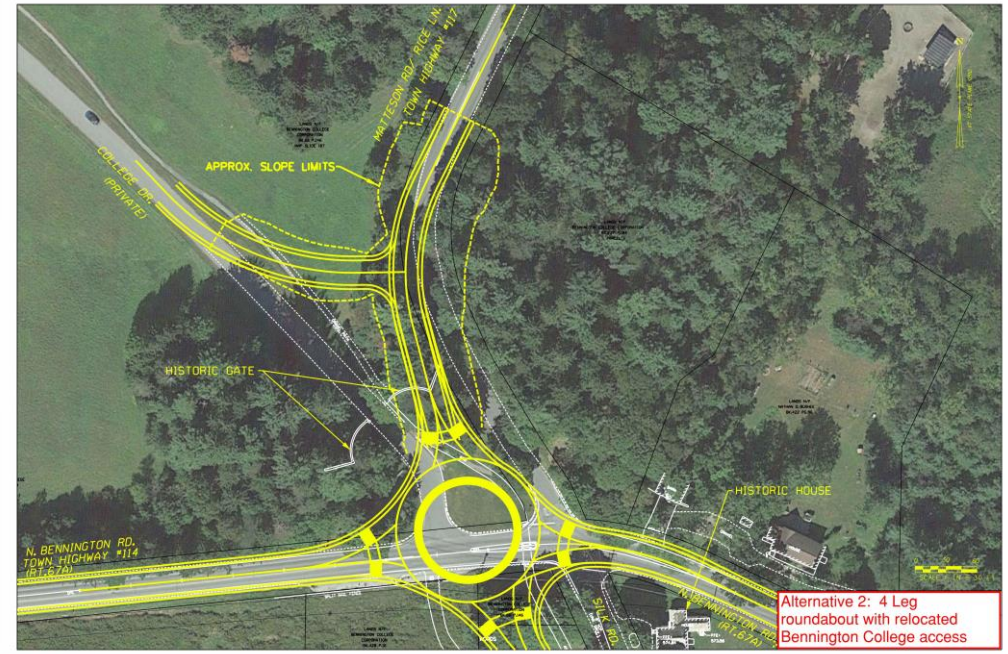
B ALTERNATIVES

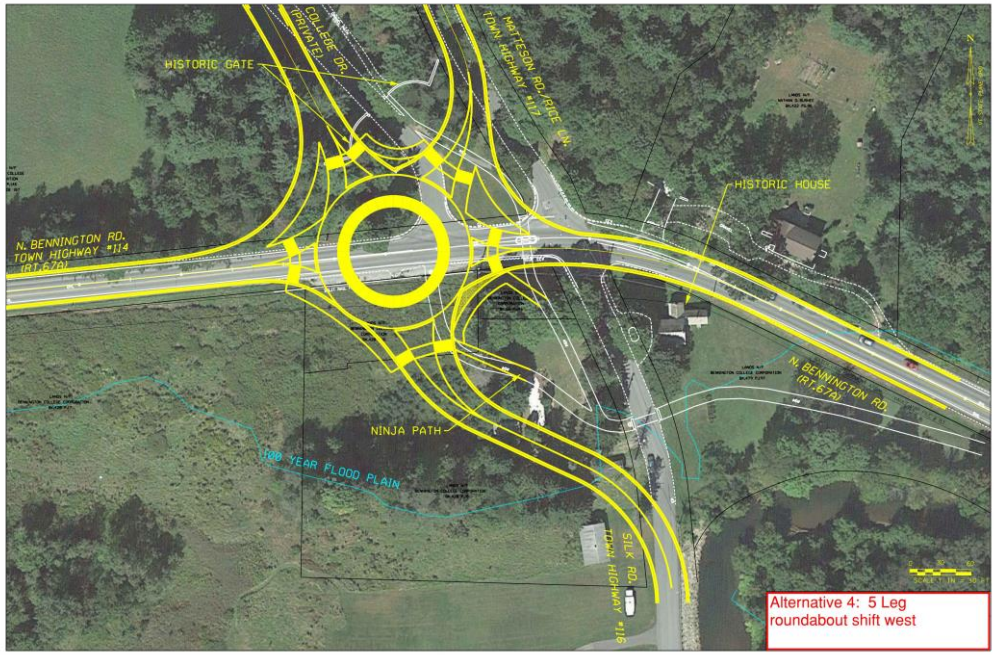
APPENDIX

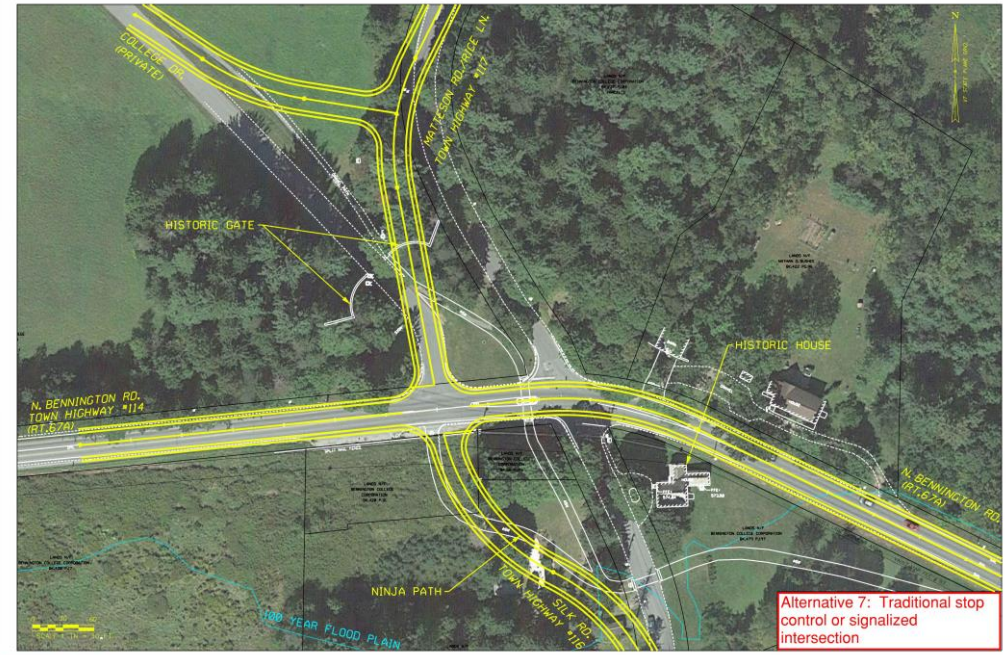
B-1 NON-PREFERRED ALTERNATIVES

VERMONT
AGENCY OF TRANSPORTATION









wsp

Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

Intersection: **Route 67A(North Bennington Road) at Rice Lane and Silk Road**
City/State: Bennington, VT
Date 2019 Performed by: WSP USA

Warrant 1 - Eight-Hour Vehicular Volume

Number of lanes of moving traffic for moving traffic on each approach:
Major Street: 1 Minor Street: 1

Vehicles per hour on major street (total of both approaches):

12:00 - 1:00 AM	0	12:00 - 1:00 PM	656
1:00 - 2:00 AM	0	1:00 - 2:00 PM	592
2:00 - 3:00 AM	0	2:00 - 3:00 PM	639
3:00 - 4:00 AM	0	3:00 - 4:00 PM	747
4:00 - 5:00 AM	0	4:00 - 5:00 PM	712
5:00 - 6:00 AM	0	5:00 - 6:00 PM	681
6:00 - 7:00 AM	275	6:00 - 7:00 PM	0
7:00 - 8:00 AM	408	7:00 - 8:00 PM	0
8:00 - 9:00 AM	490	8:00 - 9:00 PM	0
9:00 - 10:00AM	486	9:00 - 10:00PM	0
10:00 - 11:00 AM	507	10:00 - 11:00 PM	0
11:00 - 12:00 PM	526	11:00 - 12:00 PM	0

Vehicles per hour on higher-volume minor street approach (one direction only):

12:00 - 1:00 AM	0	12:00 - 1:00 PM	70
1:00 - 2:00 AM	0	1:00 - 2:00 PM	66
2:00 - 3:00 AM	0	2:00 - 3:00 PM	57
3:00 - 4:00 AM	0	3:00 - 4:00 PM	78
4:00 - 5:00 AM	0	4:00 - 5:00 PM	98
5:00 - 6:00 AM	0	5:00 - 6:00 PM	74
6:00 - 7:00 AM	29	6:00 - 7:00 PM	0
7:00 - 8:00 AM	43	7:00 - 8:00 PM	0
8:00 - 9:00 AM	77	8:00 - 9:00 PM	0
9:00 - 10:00AM	59	9:00 - 10:00PM	0
10:00 - 11:00 AM	59	10:00 - 11:00 PM	0
11:00 - 12:00 PM	66	11:00 - 12:00 PM	0

Is the intersection using the reduced volume criteria based on speed or population? No

A. Is the Minimum Vehicular Volume Warrant Met? **No**

B. Is the Interruption of Continuous Traffic Met? (35 mph speed limit) **No**

Combination of Warrants A and B Criteria Met? **No**
(Use only when Conditions A and B are both not satisified)

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

Condition A—Minimum Vehicular Volume

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

Condition B—Interruption of Continuous Traffic

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

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

Sect. 4C.02 December 2009

			150	75	120	60	105	53
			500	750	400	600	350	525
	Volume		Meets 100%		Meets 80%		Meets 70%	
	Major Rd	Minor Rd	A (500,150)	B (750,75)	A(400,120)	B(600,60)	A(350,105)	B(525,53)
12:00 - 1:00 AM	0	0	N	N	N	N	N	N
1:00 - 2:00 AM	0	0	N	N	N	N	N	N
2:00 - 3:00 AM	0	0	N	N	N	N	N	N
3:00 - 4:00 AM	0	0	N	N	N	N	N	N
4:00 - 5:00 AM	0	0	N	N	N	N	N	N
5:00 - 6:00 AM	0	0	N	N	N	N	N	N
6:00 - 7:00 AM	275	29	N	N	N	N	N	N
7:00 - 8:00 AM	408	43	N	N	N	N	N	N
8:00 - 9:00 AM	490	77	N	N	N	N	N	N
9:00 - 10:00 AM	486	59	N	N	N	N	N	N
10:00 - 11:00 AM	507	59	N	N	N	N	N	N
11:00 - 12:00 PM	526	66	N	N	N	N	N	Y
12:00 - 1:00 PM	656	70	N	N	N	Y	N	Y
1:00 - 2:00 PM	592	66	N	N	N	N	N	Y
2:00 - 3:00 PM	639	57	N	N	N	N	N	Y
3:00 - 4:00 PM	747	78	N	N	N	Y	N	Y
4:00 - 5:00 PM	712	98	N	N	N	Y	N	Y
5:00 - 6:00 PM	681	74	N	N	N	Y	N	Y
6:00 - 7:00 PM	0	0	N	N	N	N	N	N
7:00 - 8:00 PM	0	0	N	N	N	N	N	N
8:00 - 9:00 PM	0	0	N	N	N	N	N	N
9:00 - 10:00 PM	0	0	N	N	N	N	N	N
10:00 - 11:00 PM	0	0	N	N	N	N	N	N
11:00 - 12:00 PM	0	0	N	N	N	N	N	N

	100%		80%		70%	
# Hrs	A	B	A	B	A	B
MCR meets threshold	0	0	0	4	0	7

Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

Intersection: **Route 67A(North Bennington Road) at Rice Lane and Silk Road**
City/State: Bennington, VT
Count Date: 2019

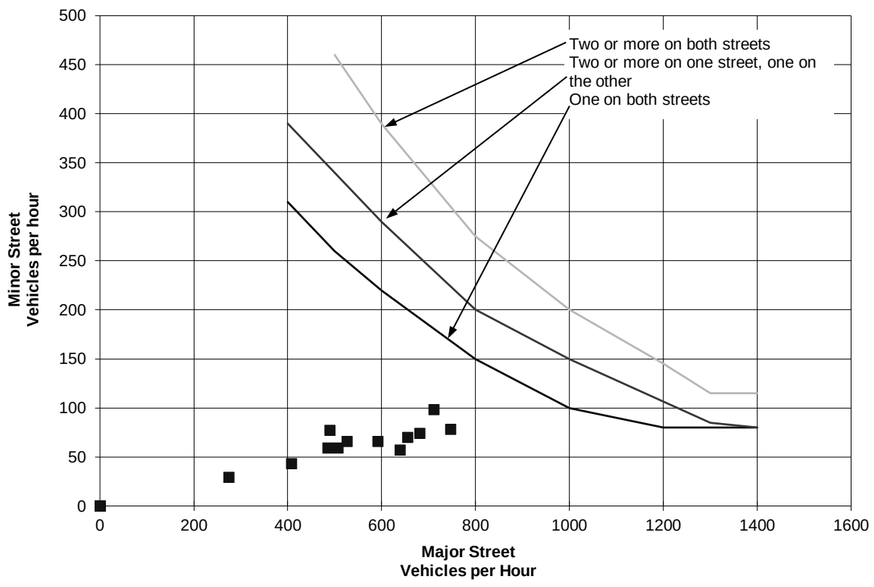
Warrant 2 - Four-Hour Vehicular Volumes

The Four Hour Volume Warrant is satisfied when each of any four hours of an average day plotted on a chart for the major street (both directions) and the higher volume of one direction of the minor street all fall above the curve in Figure 4C-1 of MUTCD.

The charts below are for the major street and the minor street.

Figure 4C-2 may be used if the 85th percentile speed of the major street exceeds 40 mph or when the intersection lies within the built-up area of an isolated community having a population less than 10,000.

Four Hour volume warrant - Major and Minor Streets for Urban Locations

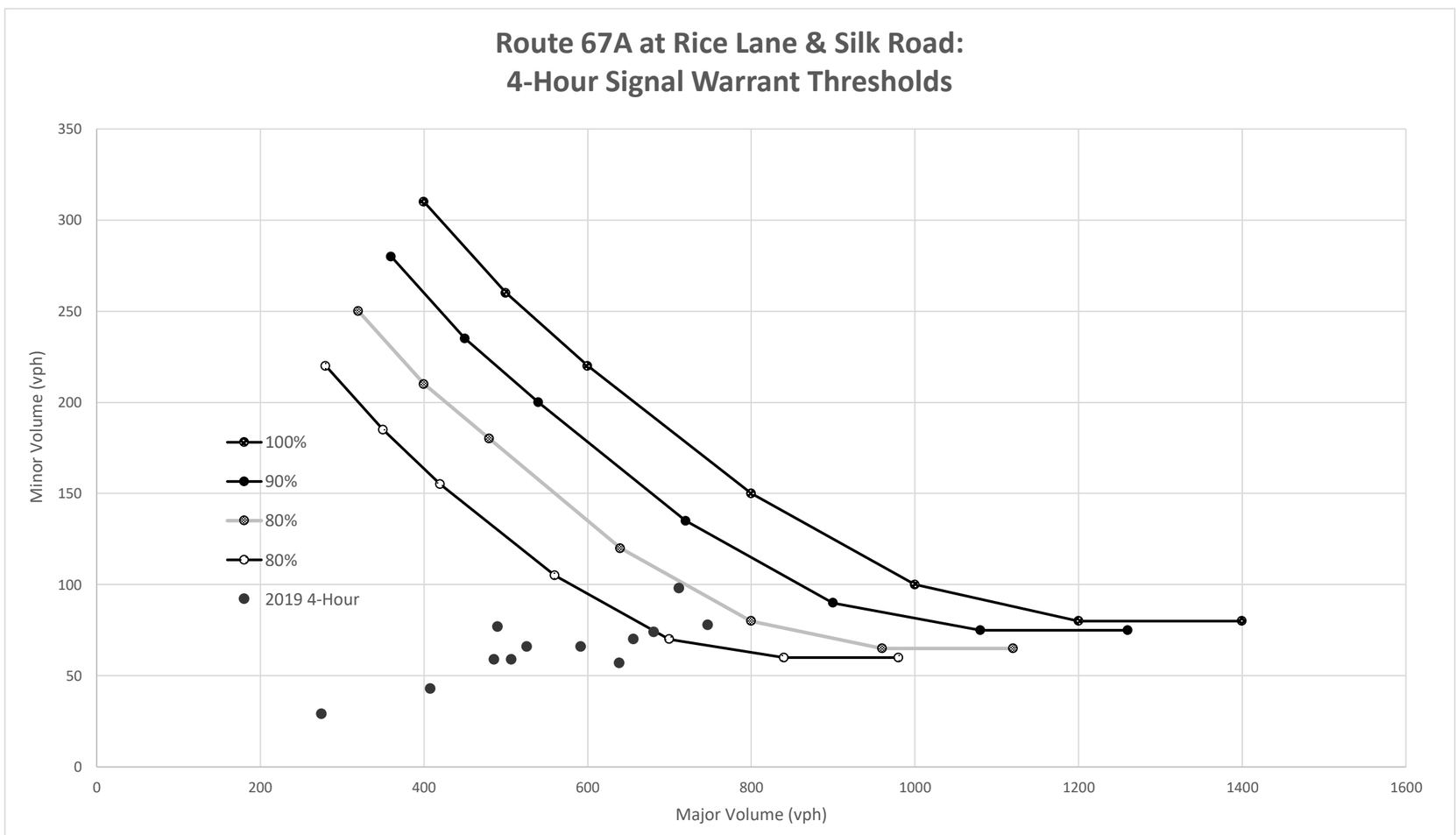


Is Four Hour Volume Warrant met? **No**

Major	Minor
275	29
408	43
490	77
486	59
507	59
526	66
656	70
592	66
639	57
747	78
712	98
681	74

One Lane and One lane

100%		90%		80%		70%	
400	310	360	280	320	250	280	220
500	260	450	235	400	210	350	185
600	220	540	200	480	180	420	155
800	150	720	135	640	120	560	105
1000	100	900	90	800	80	700	70
1200	80	1080	75	960	65	840	60
1400	80	1260	75	1120	65	980	60



Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

Intersection: Route 67A(North Bennington Road) at Rice Lane and Silk Road
City/State: Bennington, VT

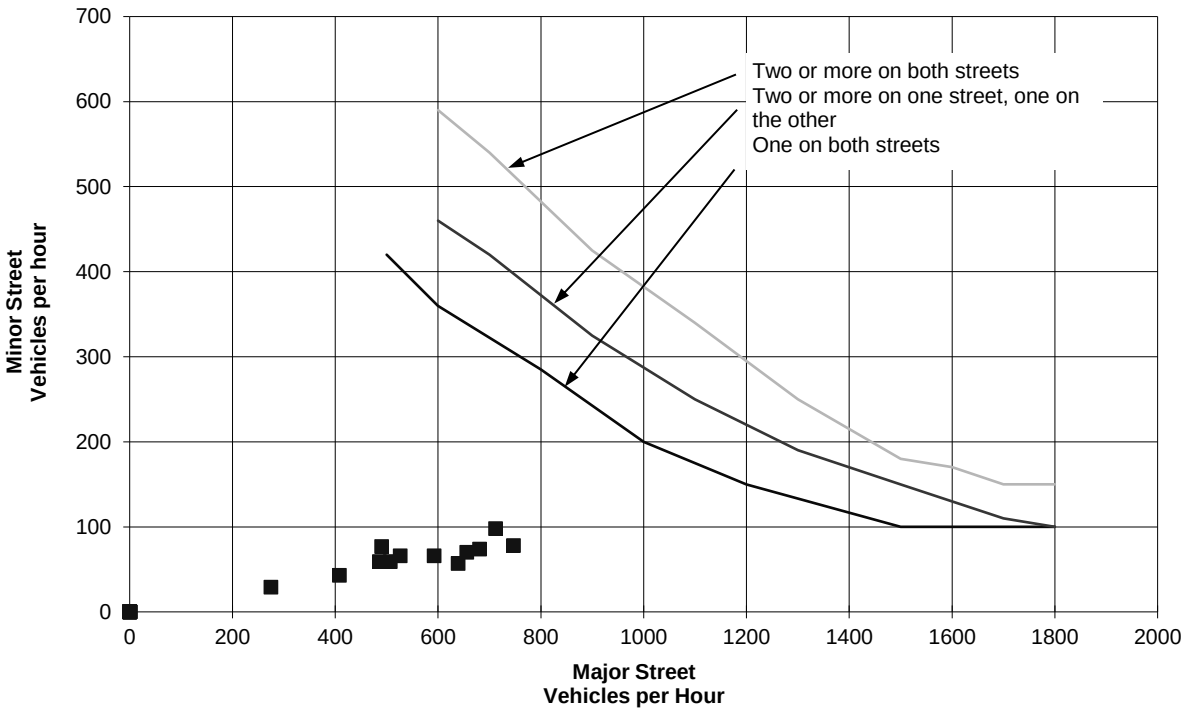
Warrant 3 - Peak Hour

The peak hour volume warrant is also intended for application when traffic conditions are such that for one hour of the day minor street traffic suffers undue traffic delay in entering or crossing the main street.

The peak hour volume warrant is satisfied when the plotted point representing vehicles per hour on the higher volume minor street for one hour falls above the curve in Figure 4C-3.

Figure 4C-4 may be used if the 85th percentile speed of the major street exceeds 40 mph or when the intersection lies within a built-up area of an isolated community having a population less than 10,000.

Peak Hour Volume Warrant - Major and Minor Streets
Warrant 3



Is Peak Hour Volume Warrant Met? **No**

Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

Intersection: Route 67A(North Bennington Road) at Rice Lane and Silk Road
City/State: Bennington, VT

Warrant 4 - Pedestrian Volume

The need for a traffic signal at an intersection or midblock crossing shall be considered if:

A. For each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrian hour crossing the major street (total of all crossings) all fall above the curve in Figure 4C-5.

B. for 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings) fall above the curve in Figure 4C-7

Number of lanes of moving traffic for moving traffic on each approach:

Major Street: 1 Minor Street: 1

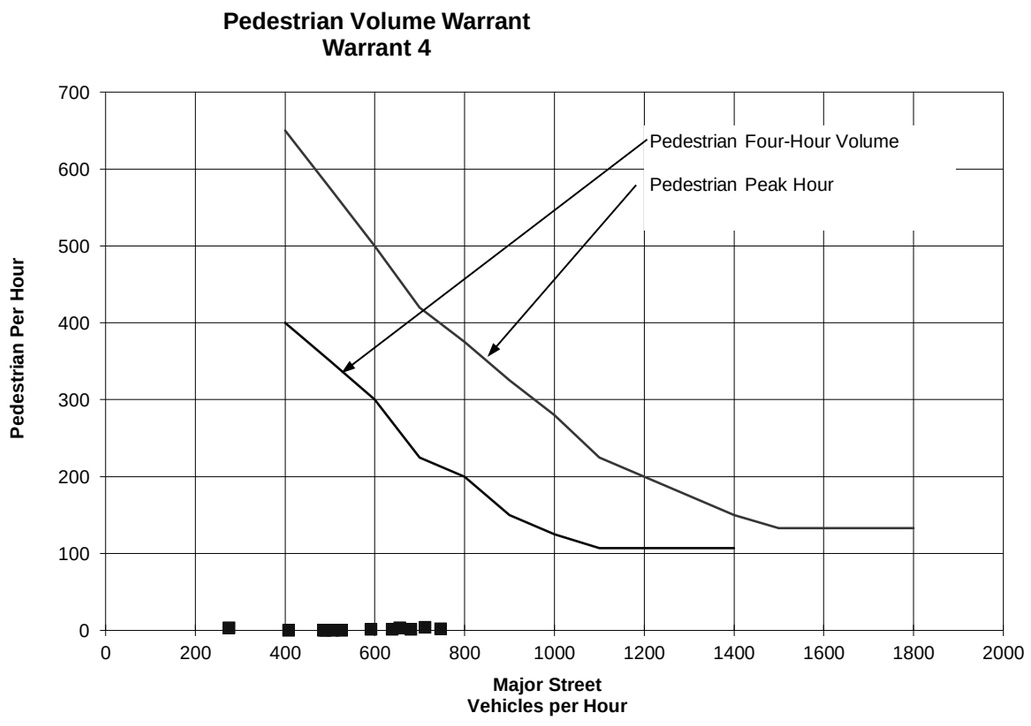
Number of pedestrians per hour crossing major street:

12:00 - 1:00 AM		12:00 - 1:00 PM	3
1:00 - 2:00 AM		1:00 - 2:00 PM	1
2:00 - 3:00 AM		2:00 - 3:00 PM	1
3:00 - 4:00 AM		3:00 - 4:00 PM	2
4:00 - 5:00 AM		4:00 - 5:00 PM	4
5:00 - 6:00 AM		5:00 - 6:00 PM	1
6:00 - 7:00 AM	3	6:00 - 7:00 PM	
7:00 - 8:00 AM	0	7:00 - 8:00 PM	
8:00 - 9:00 AM	0	8:00 - 9:00 PM	
9:00 - 10:00 AM	0	9:00 - 10:00PM	
10:00 - 11:00 AM	0	10:00 - 11:00 PM	
11:00 - 12:00 PM	0	11:00 - 12:00 PM	

Is the predominant pedestrian speed below 4 feet/second? _____

Are there 60 gaps per hour of adequate length for pedestrians to cross during the same time period when the pedestrian volume criterion are satisfied? _____

Is there a signal within 300 feet of this intersection? No



Does Minimum Pedestrian Volume meet warrants? No

Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

Intersection: Route 67A(North Bennington Road) at Rice Lane and Silk Road
City/State: Bennington, VT

Warrant 5 - School Crossing

The need for a traffic signal shall be considered when the frequency and adequacy of gaps in in the vehicular traffic stream as related to the number and size of groups of schoolchildren at an established school crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the schoolchildren are using the crossing is less than the number of minutes in the same period and there are a minimum of 20 schoolchildren during the highest crossing hour.

For purposes of this warrant, the word "schoolchildren" includes elementary through high school students.

Is there a school in the vicinity of the intersection? No

Is there a signal within 300 feet of this intersection? No

Is School Crossing Warrant Met? No

Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

Intersection: Route 67A(North Bennington Road) at Rice Lane and Silk Road
City/State: Bennington, VT

Warrant 6 - Coordinated Signal System

The need for a traffic signal shall be considered if one of the following criteria is met:

A. On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.

B. On a two-way street, adjacent traffic control signals do not provide the necessary degree of platonning and the propsed and adjacent traffic control signals will collectively provide a progressive operation.

Is Coordinated Signal System Warrant Met? **No**

Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

Intersection: Route 67A(North Bennington Road) at Rice Lane and Silk Road
City/State: Bennington, VT

Warrant 7 - Crash Experience

The Crash Experience warrant is satisfied when:

Has an adequate trial of less restrictive remedies with satisfactory observance and enforcement failed to reduce the crash frequency? Yes

Remedial measures have been taken at this intersection to reduce vehicle crash frequency, such as the installation of Rectangular Rapid Flash Beacon (RRFB) and a pedestrian refuge.

Have five or more crashes, of types susceptible to correction by traffic signal control, occurred within a 12-month period, each involving personal injury or property damage? Yes

There were five crashes in 2017 (see tables below). All eight (8) crashes reported in the 4-year analysis period were due to poor sight distance.
There were other crashes reported at the intersection but were related to weather conditions.

For each of any 8 hours of an average day, do the vehicles per hour given in both of the 80 percent columns of Condition A and B in Table 4C-1 exist on the major-street and the higher volume minor street approach, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant No

Is the Crash Experience warrant met? No
(If so, please attach an Crash Analysis Engineering study)

Crash Type	Total Crashes				
	2015	2016	2017	2018	Total
Angle	1	0	5	2	8

Crash Type	Total Crashes				
	2015	2016	2017	2018	Total
Possible Injury (C)	0	0	0	1	1
PDO, Property Damage Only	1	0	5	1	7
Total	1	0	5	2	8

Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

Intersection: Route 67A(North Bennington Road) at Rice Lane and Silk Road
City/State: Bennington, VT

Warrant 8 - Roadway Network

The need for a traffic signal is applicable when the common intersection of two or more major routes meets one or both of the following criteria:

A. Has a total of existing, or immediately projected, entering volume of at least 1,000 vehicles during the peak hour and has five-year projected volumes, based on an engineering study, which meet one or more of Warrants 1, 2, and 3 during an average weekday; or

B. Has a total existing or immediately projected entering volume of at least 1,000 vehicles for each of any five hours of a non-normal business day (Saturday and/or Sunday).

Is the Roadway Network warrant met? **No**

Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

Intersection: Route 67A(North Bennington Road) at Rice Lane and Silk Road
City/State: Bennington, VT

Warrant 9 - Intersection Near a Grade Crossing

The need for a traffic signal shall be considered if an engineering study finds that both of the following criteria are met:

A. A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approaches; and

B. During the highest traffic volume hour during which rail traffic uses the crossing, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the minor-street approach that crosses the track (one direction only, approaching the intersection) falls above the applicable curve in Figure 4C-9 or 4C-10 for the existing combination of approach lanes over the track and the distance D, which is the clear storage distance.

Is the Intersection Near Grade Crossing warrant met? **No**

Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
Prepared by WSP USA for the 2009 Edition of the USDOT MUTCD

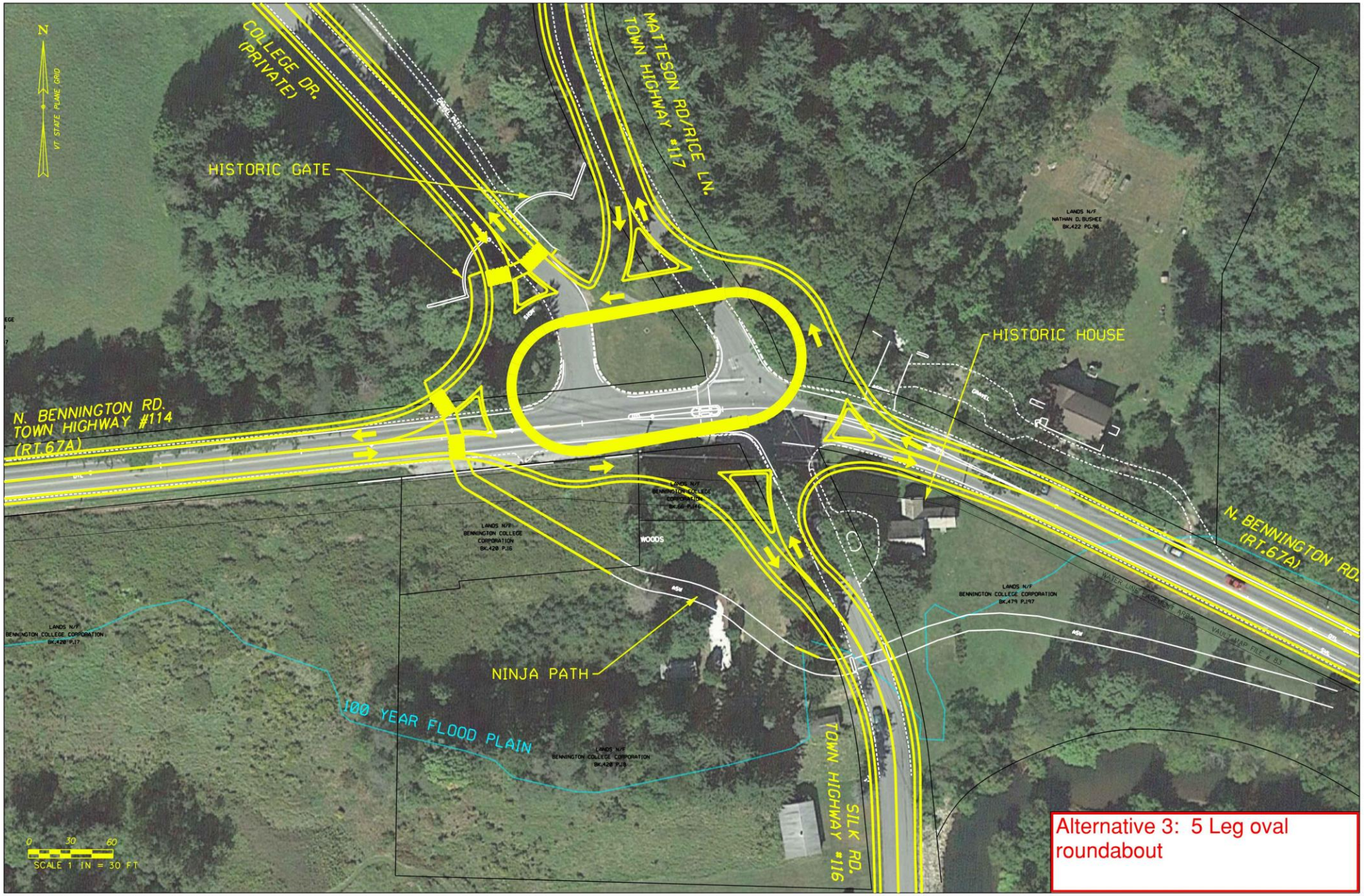
Intersection: Route 67A(North Bennington Road) at Rice Lane and Silk Road
City/State: Bennington, VT

Warrant	Description	Warrant Met?	Justification
1	**Eight-Hour Vehicular Volume**	No	The basic minimum hourly volume criteria is not met. The major-street speed limit does not exceed 40 mph or the intersection is not in an isolated community with the population less than 10,000.
2	**Four-Hour Vehicular Volume**	No	For any four hour, the combination of major-street and minor-street volumes per hour do not fall above the specified curve in figure 4C-1 MUTCD.
3	**Peak Hour**	No	For the same one hour, the volume on the minor-street approach does not equal or exceed the 100 vph or 800 vph on the major-street. For any one hour, the combination of major-street and minor-street volumes does not fall above the specified cureve in figure 4C-3 MUTCD.
4	**Pedestrian Volume**	No	Pedestarin volumes per hour in any one hour volumes do not meet the criteria to install the traffic signal.
5	**School Crossing**	No	Schoolchildren are not using the intersection to cross the major-street.
6	**Coordinated Signal System**	No	There is no nearby signalised intersection on the west of the intersection on major street to be part of the coordinated signal system.
7	**Crash Experience**	No	All criterias of the crash experience warrant are not met, however, the 80 percent volumes of the combination of the major-street and minor-street volumes for any 8 hours do not meet the volumes specified in Table 4C-1 MUTCD.
8	**Roadway Network**	No	The major street is important for the thourgh traffic in Bennington but the intersection is not major intersection serving high traffic volumes.
9	**Intersection Near a Grade Crossing**	No	The approach lanes of the intersections are not near the rail track crossing.

APPENDIX

B-2 SHORTLISTED ALTERNATIVES

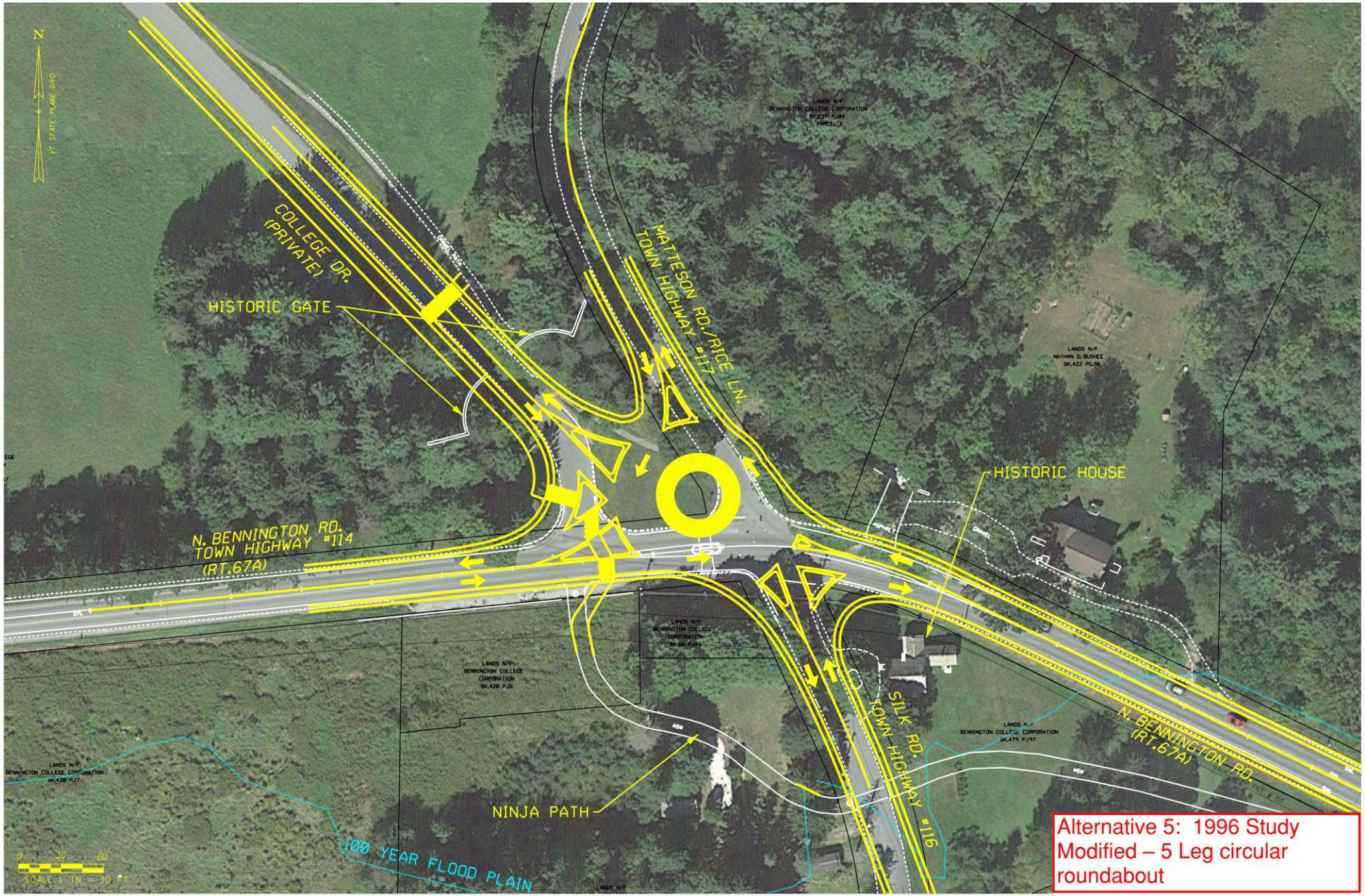
VERMONT
AGENCY OF TRANSPORTATION



Alternative 3: 5 Leg oval roundabout

wsp

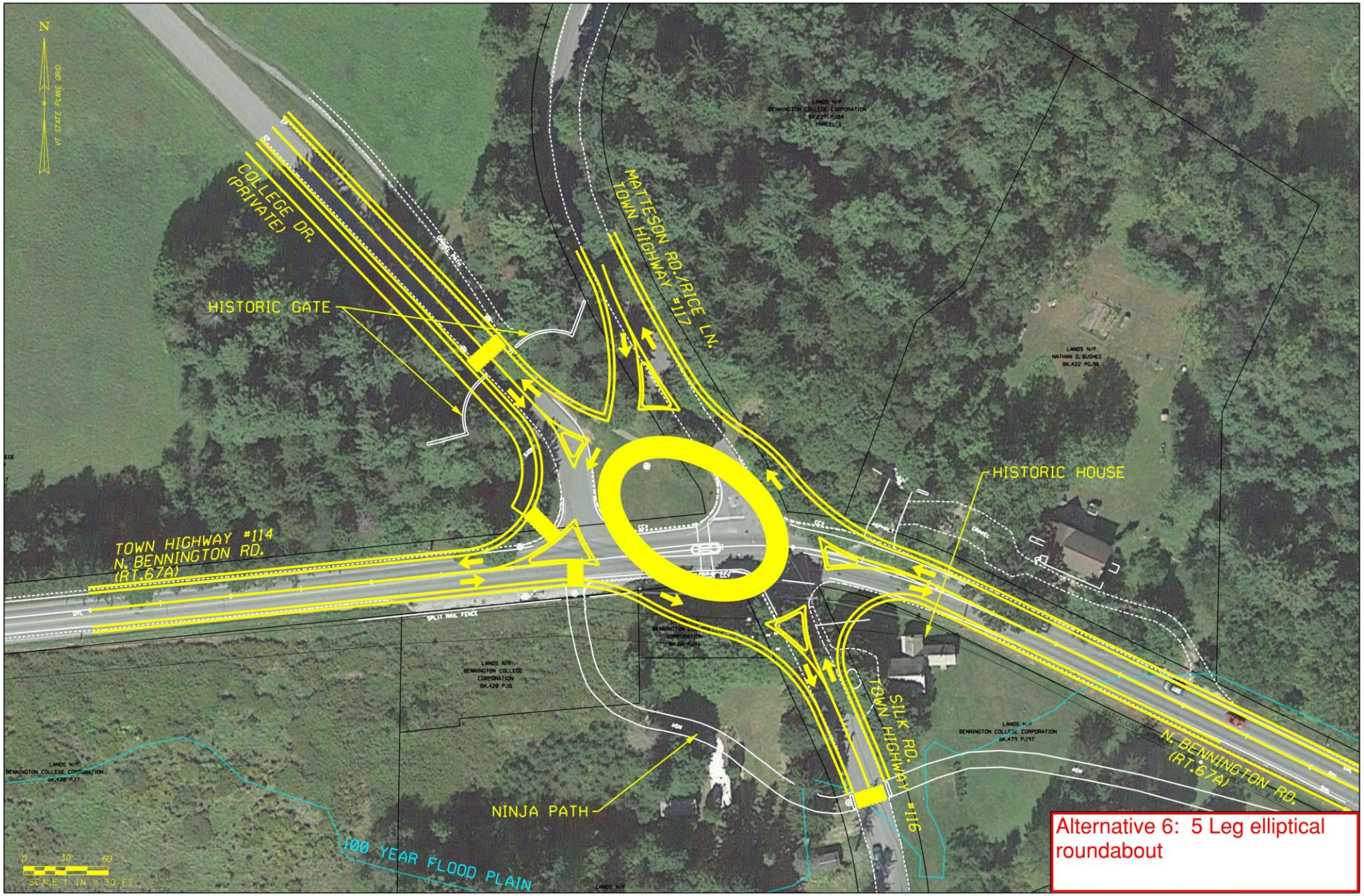
VERMONT
AGENCY OF TRANSPORTATION



Alternative 5: 1996 Study Modified – 5 Leg circular roundabout

wsp

VERMONT
AGENCY OF TRANSPORTATION



Alternative 6: 5 Leg elliptical roundabout

wsp

APPENDIX

C COST ESTIMATES & BENEFIT-COST ANALYSIS

Alternative 3 Conceptual Plans Estimate (English Units)

Project: Bennington STP 1000(23) **Date:** 4/2/2020
Project #: 52741 TSK 03 **By:** B.Bandar

Earthworks						
- Common excavation	8,100.00	cy	$ 12.00	/cy	$ 97,200	
- Earth borrow	1,700.00	cy	$ 15.00	/cy	$ 25,500	
- Cold Planing	3,400.00	sy	$ 12.00	/sy	$ 40,800	
Earthworks Cost					$ 163,500	
Pavement Structure						
- Bituminous pavement	1000.00	ton	$ 125.00	/ton	$ 125,000	
- Gravel base	1400.00	cy	$ 40.00	/cy	$ 56,000	
- Sand subbase	1200.00	cy	$ 30.00	/cy	$ 36,000	
Pavement Structure Cost					$ 217,000	
Earthworks and Pavement Cost						$ 380,500
- Roadway Factor						4.00
Roadway Cost						$ 1,522,000
- "Special" roadway items						$ 50,000
TOTAL ROADWAY COST						**$ 1,572,000**
Traffic & Safety Data						
- Project length	2000	lf	$ 25	/lf	$ 50,000	
Traffic & Safety Cost					$ 50,000	
- T & S Factor						4.00
Factored Traffic & Safety Cost						$ 200,000
- Special T & S items						$ 50,000
TOTAL T & S COST						**$ 250,000**
Miscellaneous Special Items						**$ 3,000**
TOTAL CONCEPTUAL ESTIMATED COST						**$ 1,825,000**

The total est. cost does not include prelim. engineering, ROW, or E&C

Alternative 5 Conceptual Plans Estimate (English Units)

Project: Bennington STP 1000(23) **Date:** 4/2/2020
Project #: 52741 TSK 03 **By:** B.Bandar

Earthworks						
- Common excavation	6,400.00	cy	$ 12.00	/cy	$ 76,800	
- Earth borrow	1,300.00	cy	$ 15.00	/cy	$ 19,500	
- Cold Planing	4,500.00	sy	$ 12.00	/sy	$ 54,000	
Earthworks Cost					$ 150,300	
Pavement Structure						
- Bituminous pavement	1300.00	ton	$ 125.00	/ton	$ 162,500	
- Gravel base	1200.00	cy	$ 40.00	/cy	$ 48,000	
- Sand subbase	1100.00	cy	$ 30.00	/cy	$ 33,000	
Pavement Structure Cost					$ 243,500	
Earthworks and Pavement Cost						$ 393,800
- Roadway Factor						4.00
Roadway Cost						$ 1,575,200
- "Special" roadway items						$ 50,000
TOTAL ROADWAY COST						**$ 1,625,200**
Traffic & Safety Data						
- Project length	2000	lf	$ 25	/lf	$ 50,000	
Traffic & Safety Cost					$ 50,000	
- T & S Factor						4.00
Factored Traffic & Safety Cost						$ 200,000
- Special T & S items						$ 50,000
TOTAL T & S COST						**$ 250,000**
Miscellaneous Special Items						**$ 3,000**
TOTAL CONCEPTUAL ESTIMATED COST						**$ 1,878,200**

The total est. cost does not include prelim. engineering, ROW, or E&C

Alternative 6 Conceptual Plans Estimate (English Units)

Project:	**Bennington STP 1000(23)**	**Date:**	4/2/2020
Project #:	**52741 TSK 03**	**By:**	B.Bandar

Earthworks						
- Common excavation	6,800.00	cy	$ 12.00	/cy	$ 81,600	
- Earth borrow	1,400.00	cy	$ 15.00	/cy	$ 21,000	
- Cold Planing	4,500.00	sy	$ 12.00	/sy	$ 54,000	
Earthworks Cost					$ 156,600	
Pavement Structure						
- Bituminous pavement	1300.00	ton	$ 125.00	/ton	$ 162,500	
- Gravel base	1400.00	cy	$ 40.00	/cy	$ 56,000	
- Sand subbase	1200.00	cy	$ 30.00	/cy	$ 36,000	
Pavement Structure Cost					$ 254,500	
Earthworks and Pavement Cost						$ 411,100
- Roadway Factor						4.00
Roadway Cost						$ 1,644,400
- "Special" roadway items						$ 50,000
TOTAL ROADWAY COST						**$ 1,694,400**
Traffic & Safety Data						
- Project length	2000	lf	$ 25	/lf	$ 50,000	
Traffic & Safety Cost					$ 50,000	
- T & S Factor						4.00
Factored Traffic & Safety Cost						$ 200,000
- Special T & S items						$ 50,000
TOTAL T & S COST						**$ 250,000**
Miscellaneous Special Items						**$ 3,000**
TOTAL CONCEPTUAL ESTIMATED COST						**$ 1,947,400**

The total est. cost does not include prelim. engineering, ROW, or E&C

Bennington STP 1000(23)

Alternative 3
Intersection Cost Comparison

Annual Costs	Roundabout		Two-Way Stop Control	
Safety	**Predicted Annual Crashes**	**Safety Cost**	**Predicted Annual Crashes**	**Safety Cost**
Predicted Fatal/Injury Crashes	0.12	$ 41,930	0.39	$ 143,132
Predicted PDO Crashes	0.72	$ 5,465	0.63	$ 4,814
	Annual Costs of Predicted Crashes	**$ 47,394**	***Annual Costs of Predicted Crashes***	**$ 147,946**
Delay	**Annual Intersection Delay (person-hrs)**	**Delay Cost**	**Annual Intersection Delay (person-hrs)**	**Delay Cost**
Average Annual Person (in Vehicle) Delay	2008	**$ 25,389**	4485	**$ 56,036**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
Annualized Cost of Signal Retiming		$ -	Signal Retiming Every 3 Years	$ -
Annual Cost of Power for Signal		$ -	Power for Signal	$ -
Annual Cost of Illumination	Intersection Illumination	$ 750	Intersection Illumination	$ 750
Annual Cost of Maintenance	Landscaping Costs	$ 2,000	Signal Maintenance Costs (power outage, detection, etc.)	$ 2,000
	Total Annual Operation and Maintenance Costs	**$ 2,750**	***Total Annual Operation and Maintenance Costs***	**$ 2,750**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering		$ -		$ -
Right-of-way and Utilities		$ -		$ -
Construction		$ 1,825,000		$ -

*Delay cost is based upon a 2 hour analysis period.

Total Discounted Life Cycle Costs (2020 - 2040)	Roundabout		Two-Way Stop Control	
Safety	**Total Predicted Crashes**	**Safety Cost**	**Total Predicted Crashes**	**Safety Cost**
Predicted Fatal/Injury Crashes	2.31	$ 623,805	7.88	$ 2,129,444
Predicted PDO Crashes	14.38	$ 81,300	12.67	$ 71,625
	Total Costs of Predicted Crashes	**$ 705,105**	***Total Costs of Predicted Crashes***	**$ 2,201,069**
Delay	**Total Intersection Delay (person-hrs)**	**Delay Cost**	**Total Intersection Delay (person-hrs)**	**Delay Cost**
Total Person (in Vehicle) Delay	42161	**$ 533,161**	94183	**$ 1,176,753**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
Annualized Cost of Signal Retiming		$ -	Signal Retiming Every 3 Years	$ -
Annual Cost of Power for Signal		$ -	Power for Signal	$ -
Annual Cost of Illumination	Intersection Illumination	$ 11,158	Intersection Illumination	$ 11,158
Annual Cost of Maintenance	Landscaping Costs	$ 29,755	Signal Maintenance Costs (power outage, detection, etc.)	$ 29,755
	Total Annual Operation and Maintenance Costs	**$ 40,913**	***Total Annual Operation and Maintenance Costs***	**$ 40,913**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering		$ -		$ -
Right-of-way and Utilities		$ -		$ -
Construction		$ 1,825,000		$ -
	Total Initial Capital Costs	**$ 1,825,000**	***Total Initial Capital Costs***	**$ -**
Total Life Cycle Costs (Opening Year $)	**Net Present Value**	**$ 3,104,180**	**Net Present Value**	**$ 3,418,736**

*Delay cost is based upon a 2 hour analysis period.

Roundabout

Two-Way Stop Control

Life Cycle Benefit/Cost Ratio		
Safety Benefit of a Roundabout	$	1,495,964
Delay Reduction Benefit of a Roundabout	$	643,592
Total Benefits	**$**	**2,139,556**
Added Operations&Maintenance Costs of a Roundabout	$	-
Added Capital Costs of a Roundabout	$	1,825,000
Total Costs	**$**	**1,825,000**
Life Cycle Benefit/Cost Ratio	**1.2**	**Roundabout Compared to Two-Way Stop Control**

Roundabout Preferred

Notes: 1. Signal maintenance costs are the pedestrian signal maintenance costs.
2. Intersection illumination is the roadway lighting.

Source: VDOT Roundabout Cost Comparison Tool

Bennington STP 1000(23)

Alternative 5
Intersection Cost Comparison

Annual Costs	Roundabout		Two-Way Stop Control	
Safety	**Predicted Annual Crashes**	**Safety Cost**	**Predicted Annual Crashes**	**Safety Cost**
Predicted Fatal/Injury Crashes	0.12	$ 41,930	0.39	$ 143,132
Predicted PDO Crashes	0.72	$ 5,465	0.63	$ 4,814
	Annual Costs of Predicted Crashes	**$ 47,394**	***Annual Costs of Predicted Crashes***	**$ 147,946**
Delay	**Annual Intersection Delay (person-hrs)**	**Delay Cost**	**Annual Intersection Delay (person-hrs)**	**Delay Cost**
Average Annual Person (in Vehicle) Delay	2301	**$ 29,102**	4485	**$ 56,036**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
Annualized Cost of Signal Retiming		$ -	Signal Retiming Every 3 Years	$ -
Annual Cost of Power for Signal		$ -	Power for Signal	$ -
Annual Cost of Illumination	Intersection Illumination	$ 750	Intersection Illumination	$ 750
Annual Cost of Maintenance	Landscaping Costs	$ 2,000	Signal Maintenance Costs (power outage, detection, etc.)	$ 2,000
	Total Annual Operation and Maintenance Costs	**$ 2,750**	***Total Annual Operation and Maintenance Costs***	**$ 2,750**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering		$ -		$ -
Right-of-way and Utilities		$ -		$ -
Construction		$ 1,878,200		$ -

*Delay cost is based upon a 2 hour analysis period.

Total Discounted Life Cycle Costs (2020 - 2040)	Roundabout		Two-Way Stop Control	
Safety	**Total Predicted Crashes**	**Safety Cost**	**Total Predicted Crashes**	**Safety Cost**
Predicted Fatal/Injury Crashes	2.31	$ 623,805	7.88	$ 2,129,444
Predicted PDO Crashes	14.38	$ 81,300	12.67	$ 71,625
	Total Costs of Predicted Crashes	**$ 705,105**	***Total Costs of Predicted Crashes***	**$ 2,201,069**
Delay	**Total Intersection Delay (person-hrs)**	**Delay Cost**	**Total Intersection Delay (person-hrs)**	**Delay Cost**
Total Person (in Vehicle) Delay	48327	**$ 611,138**	94183	**$ 1,176,753**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
Annualized Cost of Signal Retiming		$ -	Signal Retiming Every 3 Years	$ -
Annual Cost of Power for Signal		$ -	Power for Signal	$ -
Annual Cost of Illumination	Intersection Illumination	$ 11,158	Intersection Illumination	$ 11,158
Annual Cost of Maintenance	Landscaping Costs	$ 29,755	Signal Maintenance Costs (power outage, detection, etc.)	$ 29,755
	Total Annual Operation and Maintenance Costs	**$ 40,913**	***Total Annual Operation and Maintenance Costs***	**$ 40,913**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering		$ -		$ -
Right-of-way and Utilities		$ -		$ -
Construction		$ 1,878,200		$ -
	Total Initial Capital Costs	**$ 1,878,200**	***Total Initial Capital Costs***	**$ -**
Total Life Cycle Costs (Opening Year $)	**Net Present Value**	**$ 3,235,357**	**Net Present Value**	**$ 3,418,736**
	Roundabout		Two-Way Stop Control	

*Delay cost is based upon a 2 hour analysis period.

Life Cycle Benefit/Cost Ratio		
Safety Benefit of a Roundabout	$ 1,495,964	
Delay Reduction Benefit of a Roundabout	$ 565,615	
Total Benefits	**$ 2,061,579**	
Added Operations&Maintenance Costs of a Roundabout	$ -	
Added Capital Costs of a Roundabout	$ 1,878,200	
Total Costs	**$ 1,878,200**	
Life Cycle Benefit/Cost Ratio	**1.1**	**Roundabout Compared to Two-Way Stop Control**
	Roundabout Preferred	

Notes: 1. Signal maintenance costs are the pedestrian signal maintenance costs.
2. Intersection illumination is the roadway lighting.

Source: VDOT Roundabout Cost Comparison Tool

Bennington STP 1000(23)

Alternative 6
Intersection Cost Comparison

Annual Costs	Roundabout		Two-Way Stop Control	
Safety	**Predicted Annual Crashes**	**Safety Cost**	**Predicted Annual Crashes**	**Safety Cost**
Predicted Fatal/Injury Crashes	0.12	$ 41,930	0.39	$ 143,132
Predicted PDO Crashes	0.72	$ 5,465	0.63	$ 4,814
	Annual Costs of Predicted Crashes	**$ 47,394**	***Annual Costs of Predicted Crashes***	**$ 147,946**
Delay	**Annual Intersection Delay (person-hrs)**	**Delay Cost**	**Annual Intersection Delay (person-hrs)**	**Delay Cost**
Average Annual Person (in Vehicle) Delay	1705	**$ 21,557**	5485	**$ 68,536**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
Annualized Cost of Signal Retiming		$ -	Signal Retiming Every 3 Years	$ -
Annual Cost of Power for Signal		$ -	Power for Signal	$ -
Annual Cost of Illumination	Intersection Illumination	$ 750	Intersection Illumination	$ 750
Annual Cost of Maintenance	Landscaping Costs	$ 2,000	Signal Maintenance Costs (power outage, detection, etc.)	$ 2,000
	Total Annual Operation and Maintenance Costs	**$ 2,750**	***Total Annual Operation and Maintenance Costs***	**$ 2,750**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering		$ -		$ -
Right-of-way and Utilities		$ -		$ -
Construction		$ 1,947,400		$ -

*Delay cost is based upon a 2 hour analysis period.

Total Discounted Life Cycle Costs (2020 - 2040)	Roundabout		Two-Way Stop Control	
Safety	**Total Predicted Crashes**	**Safety Cost**	**Total Predicted Crashes**	**Safety Cost**
Predicted Fatal/Injury Crashes	2.31	$ 623,805	7.88	$ 2,129,444
Predicted PDO Crashes	14.38	$ 81,300	12.67	$ 71,625
	Total Costs of Predicted Crashes	**$ 705,105**	***Total Costs of Predicted Crashes***	**$ 2,201,069**
Delay	**Total Intersection Delay (person-hrs)**	**Delay Cost**	**Total Intersection Delay (person-hrs)**	**Delay Cost**
Total Person (in Vehicle) Delay	35798	**$ 452,700**	115193	**$ 1,439,260**
Operation and Maintenance	**Operation and Maintenance**	**O&M Cost**	**Operation and Maintenance**	**O&M Cost**
Annualized Cost of Signal Retiming		$ -	Signal Retiming Every 3 Years	$ -
Annual Cost of Power for Signal		$ -	Power for Signal	$ -
Annual Cost of Illumination	Intersection Illumination	$ 11,158	Intersection Illumination	$ 11,158
Annual Cost of Maintenance	Landscaping Costs	$ 29,755	Signal Maintenance Costs (power outage, detection, etc.)	$ 29,755
	Total Annual Operation and Maintenance Costs	**$ 40,913**	***Total Annual Operation and Maintenance Costs***	**$ 40,913**
Initial Capital Costs	**Total Capital Costs**	**Cost**	**Total Capital Costs**	**Cost**
Preliminary Engineering		$ -		$ -
Right-of-way and Utilities		$ -		$ -
Construction		$ 1,947,400		$ -
	Total Initial Capital Costs	**$ 1,947,400**	***Total Initial Capital Costs***	**$ -**
Total Life Cycle Costs (Opening Year $)	**Net Present Value**	**$ 3,146,118**	**Net Present Value**	**$ 3,681,242**
	Roundabout		Two-Way Stop Control	

*Delay cost is based upon a 2 hour analysis period.

Life Cycle Benefit/Cost Ratio		
Safety Benefit of a Roundabout	$ 1,495,964	
Delay Reduction Benefit of a Roundabout	$ 986,560	
Total Benefits	**$ 2,482,524**	
Added Operations&Maintenance Costs of a Roundabout	$ -	
Added Capital Costs of a Roundabout	$ 1,947,400	
Total Costs	**$ 1,947,400**	
Life Cycle Benefit/Cost Ratio	**1.3**	**Roundabout Compared to Two-Way Stop Control**
	Roundabout Preferred	

Notes: 1. Signal maintenance costs are the pedestrian signal maintenance costs.
2. Intersection illumination is the roadway lighting.

Source: VDOT Roundabout Cost Comparison Tool

APPENDIX

D EVALUATION MATRIX

Bennington STP 1000(23)

EVALUATION MATRIX

VT ROUTE 67A AT SILK ROAD AND RICE LANE PROJECT # 52741 TSK 03	No-Build	Alternative 3	Alternative 5	Alternative 6	Weight Multiplier
		5 Leg Oval	1996 Study Modified - 5 Leg Circular	5 Leg Elliptical	
CONSTRUCTION COST[1]	$0	$ 1,825,000	$ 1,878,200	$ 1,947,400	1
LOS / QUEUE LENGTH (feet)[2]	A / 95	B / 310	C / 405	A / 265	1
POTENTIAL ROW IMPACTS	None	Greatest	Lowest	Moderate	1
SIGHT DISTANCE IMPROVEMENT	None	Moderate	Lowest	Greatest	1
CONSTRUCTION DURATION	None	18 months	18 months	18 months	1
SAFETY / CRASH REDUCTION:					
APPROACH ROADWAY DEFLECTION	None	Yes	Yes	Yes	2
ROUNDABOUT CIRCULATING SPEED	None	Greatest	Lowest	Moderate	1
TRAFFIC CONFLICT POINTS	High	Lowest	Greatest	Lowest	2
BICYCLE / PEDESTRIAN SAFETY	Low	Moderate	Lowest	Greatest	2
ENVIRONMENTAL IMPACTS:					
HISTORICAL/CULTURAL RESOURCES	No Impact	Moderate	Moderate	Moderate	1
WETLANDS	No Impact	No Impact	No Impact	No Impact	1
FLOOD PLAIN	No Impact	Moderate	Moderate	Moderate	1
IMPERVIOUS AREA	No Impact	Lowest	Greatest	Lowest	1
BENEFIT COST RATIO[3]	0	1.2	1.1	1.3	2
EVALUATION RATING[4]	**9**	**7**	**3**	**12**	

[1] Costs are estimates only, used for comparison purposes.

[2] Level of Service and Queue Length are based on year 2040 forecast.

Level of Service for an unsignalized intersection is defined as: "A" ≤ 10 sec delay; "B" > 10 sec delay ≤ 15 sec; "C" > 15 sec delay ≤ 25 sec.

[3] Benefit Cost Ratio is based on roundabout vs two-way stop control.

[4] Evaluation rating is based on total number of positive impacts (Highlighted in Green) multiplied by weight multiplier.

Legend

Good	Positive Impact
Neutral	
Poor	Negative Impact

APPENDIX

E RISK REGISTER

LEVEL 1 - RISK REGISTER		Project Name:	Bennington STP 1000(23)			Intersection of VT Route 67A (North Bennington Road) at Matteson Road, Silk Road and College Drive		Project Manager	Michael LaCroix		
Risk Identification							Risk Rating		Risk Response		
Status	ID #	Type	Category	Title	Risk Statement	Current status/assumptions	Priority Rating	Rationale for Rating	Strategy	Response Actions	Risk Owner	Updated
Active	1	Threat	Design	Historic house at corner of VT 67A and Silk Road	Potential historic impact due to encroachment into the subject property	Intent is to minimize slope encroachment	Medium	.	Accept		Agency	
Active	2	Threat	Design	Historic gate at Bennington College Drive	Potential impact due to encroachment of approach roadway/ped path	Intent is to minimize impact. Reconstruction of a portion of the gate may be evaluated as concept is advanced	Medium		Accept		Agency	
Active	3	Threat	ROW	Bennington College property	Bennington college owns the majority of the abutting parcels.	College has stated (unofficially) that they will donate the land required to the State.	High		Accept		Agency	
Active	4	Threat	Construction	Work Zone Traffic Management	Maintain one lane open for travel in each direction.		High		Mitigate		Contractor	
Active	5	Opportunity	Construction	Utilities	If the project Contract Award is delayed, private utility companies would have additional time to relocate.		Medium		Accept		Agency	
Active	6	Threat	Construction	Utility Relocation	Utility relocation is required. Impacts will not be fully understood until coordination begins.		Medium		Accept		Agency	
Active	7	Threat	Construction	Night work	Worker safety and driver visibility.		Medium		Mitigate		Contractor	
Active	8	Threat	Construction	Work Zone Traffic Pedestrian and Bicycle Management	Maintain pedestrian and bicycle access through out construction.	Ninja path is an asset to both the Town and College and maintaining connection is important consideration.	Medium		Mitigate		Contractor	

APPENDIX

F SELECT BOARD MEETING MINUTES

BENNINGTON SELECT BOARD

BENNINGTON FIRE FACILITY

130 RIVER STREET

BENNINGTON, VERMONT 05201

JANUARY 27, 2020

MINUTES

SELECT BOARD MEMBERS PRESENT: Donald Campbell-Chair; Jeannie Jenkins-Vice Chair; Jeanne Conner; Jim Carroll; Bruce Lee-Clark; and Chad Gordon.

SELECT BOARD MEMBERS ABSENT: Bill Scully.

ALSO PRESENT: Stuart Hurd-Town Manager; Daniel Monks-Assistant Town Manager and Planning Director; Shannon Barsotti-Community Development Director; Timothy Higginson and Richard Tetreault-WSP and Michael LaCroix-VTrans for the Vermont Agency of Transportation; Jason Dolmetsch-MSK Engineering & Design; Kevin Hoyt; Colleen Harrington; John Shannahan; Matt Willey; Jonah Spivak; Lynn Green; Matt Harrington; Sarah Paranvaseau; Ryan Hasslett; Eric Peterson; Betsy Greenawalt; Heather Hasslett; Nancy White; Rose Talbot; Police Officer; 10 citizens; CAT-TV; Jim Therrien-Bennington Banner and Nancy H. Lively-Secretary.

At 6:01pm, Chair Donald Campbell called the meeting to order.

1. PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was recited by all present.

5. SILK ROAD INTERSECTION ALTERNATIVES

Mr. Monks stated that the VT Route 67A at Matteson Road, Silk Road and College Drive intersection has been a "high accident location" for many years, and the Town has urged the State of Vermont to improve that intersection.

Timothy Higginson, Michael LaCroix, and Richard Tetreault did the following presentation:

- We are, and have been for the past year, in the Scoping Process of the Project Development.
- We are now at the end of the Scoping Process with the Project Definition, and can move into the Project Design within a month or two.
- The high accident location was first assessed in 1985, revisited in 1989 and 1992, a Local Concerns Meeting was held on October 13, 1994, and a final scoping report was prepared by the Vermont Agency of Transportation Planning Division in February 1996.
- The high accident location is now being revisited again and assessed with a Local Concerns Meeting held on February 7, 2019.
- Non-Preferred Alternatives:
  - ✓ Alternative 1 - 3 leg roundabout with relocated Bennington College access. This was not preferred by Bennington College.
  - ✓ Alternative 2 - 4 leg roundabout with relocated Bennington College access. Also not preferred by Bennington College.

- ✓ Alternative 4 - 5 leg roundabout shift west. Access issues, as well as, issues with the College historic gate.
- ✓ Alternative 7 - Traditional stop control or signalized intersection. Not suitable for this location because of the College entrance.

- Shortlisted Alternatives:
  - ✓ Alternative 3 - 5 leg oval roundabout. Single lane with separation between drives. Avoids an historic house and minimizes the impact on the historic gate.
  - ✓ Alternative 5 - 1996 Study Modified-5 leg circular roundabout. Has bypass lane with free rights onto Route 67A from Silk Road and is a smaller circle at 120' in diameter. The roundabout at Walmart is 130' in diameter. There is no deflection when entering the roundabout from the East which will increase speed. This could be improved by shifting the location of the circle to the North or West, however, is not as much of an improvement as Alternative 6 would be.
  - ✓ Alternative 6 - 5 leg elliptical roundabout. This measures 130' across the short access and 200' along the elongated access. This brings Matteson Road and College Drive in farther apart with the biggest positive being a lot of deflection on Route 67A which will slow down the traffic to make merging in from the yield signs easier. Bennington College supports Alternative 6.
- Evaluation Matrix Comparing the Three Shortlisted Alternatives Shows:
  - ✓ The cost of each of the three is very close.
  - ✓ Each would take 18 months to build with phased construction - one lane open at all times.
  - ✓ Queue length, potential row impacts, sight distance improvement, approach roadway deflection, roundabout circulating speed traffic conflict points, historical/cultural resources, wetlands, flood plain and impervious area comparisons show that Alternative 6 has the most positive impact.
  - ✓ Benefit cost ratio - a factor of capacity and safety compared to the cost - rates Alternative 6 the highest.
- Next Steps:
  - ✓ Accept Town Preferred Alternative
  - ✓ VTrans Review and Final Decision
  - ✓ Scoping Report Finalized
  - ✓ Project Programming

Board questions/comments:

Ms. Conner: Asked them to speak to the pedestrian and cycling impact, and Mr. Higginson answered that the connection to the Ninja Path would be maintained, further consideration will be given to see if there should be a separation between the bike traffic from the roundabout, itself, including a wider shoulder width. Pedestrians will use the Ninja Path and the "splitter islands" to navigate around the roundabout.

Ms. Conner: Noted that future boards and town managers would appreciate any tips as to how we can move these projects along faster than 35 years pace, and Mr. Higginson stated that it was "squashed" and never actually became a project in the earlier years. It is now a priority for us, and if the College follows through with giving the land to us, that could reduce the time by 2 years.

Mr. Carroll: Asked the definition of impervious area, and Mr. Higginson responded that is a pavement area.

Ms. Jenkins: Was concerned about the safety of pedestrians on the splitter islands/refuge islands, and Mr. Higginson stated that those exist now with traffic traveling at a higher rate of speed that they would with the roundabout. The estimated speed on the roundabout would be 15mph - much slower than traffic is moving now with a better line of site for the motorists to the refuge islands than there is now. Cyclists would have the option of just staying on the Ninja Path, riding in a bike lane on the roundabout (though that is uncommon), or comfortably using the roundabout with a traffic speed of 15mph.

Mr. Campbell: Prefers Alternative 5 1996 Modified with a circular roundabout and without the slip lane. He feels this one would have the most traffic calming and not be compromising the pedestrian crossing. Mr. Higginson noted their concerns with this Alternative as the deflection of traffic from Silk Road and the maneuvering of truck traffic from Bennington College. Additional work would need to be done to address these issues, such as moving the roundabout, should we proceed further with this Alternative.

Mr. Campbell: Stated he is not familiar with an elliptical roundabout and is concerned with the turning on it. Other board members indicated that he had probably been on one without realizing it. They are common in Massachusetts and New Jersey.

Mr. Lee-Clark: Noted that the roundabout circulating speed on Alternative 5 had a more positive impact that the speed on Alternative 6, yet it looks like if you were travelling north and wanted to go east, you would hardly have to slow down. Mr. Higginson agreed and would require further work to improve the deflection from that direction.

Mr. Lee-Clark: Given the distance from the river, he would be in favor of Alternative 6 which utilizes a greater area to mitigate the water runoff with the lowest impervious area.

Mr. Campbell: Our three primary concerns are pedestrian safety, calming of traffic, and a positive partnership with Bennington College.

Bruce Lee-Clark moved and Jim Carroll seconded for the Vermont Agency of Transportation to go forward with Alternative 6 at the intersection of Vermont Route 67A (North Bennington Road) at Matteson Road, Silk Road and College Drive as presented. The motion carried with Bill Scully absent.

APPENDIX

G VISSIM RESULTS

Volume Validation - Route 67A - Alternative 3

	Aproach	Movement	Target Volume	Average Simulated	GEH	Run 1 Simulated	1 GEH	Run 2 Simulated	2 GEH	Run 3 Simulated	3 GEH	Run 4 Simulated	4 GEH	Run 5 Simulated	5 GEH	Run 6 Simulated	6 GEH	Run 7 Simulated	7 GEH	Run 8 Simulated	8 GEH	Run 9 Simulated	9 GEH	Run 10 Simulated	10 GEH
2040 AM	EB Route 67A	L (College)	8	7	0.4	9	0.3	5	1.2	8	0.0	2	2.2	5	1.2	7	0.4	12	1.1	7	0.4	6	0.8	9	0.3
		L (Rice)	3	3	0.0	2	0.6	1	1.4	2	0.6	2	0.6	2	0.6	4	0.5	7	1.8	2	0.6	3	0.0	5	1.0
		T	250	263	0.8	279	1.8	292	2.6	254	0.3	237	0.6	263	0.8	278	1.7	257	0.4	270	1.2	265	0.9	230	1.3
		R	16	18	0.5	23	1.6	24	1.8	15	0.3	16	0.0	18	0.5	18	0.5	15	0.3	17	0.2	18	0.5	15	0.3
	WB Route 67A	L	3	4	0.5	3	0.0	2	0.6	2	0.6	4	0.5	1	1.4	5	1.0	5	1.0	6	1.4	6	1.4	4	0.5
		T	153	162	0.7	175	1.7	156	0.2	153	0.0	157	0.3	166	1.0	166	1.0	193	3.0	167	1.1	153	0.0	138	1.2
		R (College)	45	46	0.1	59	1.9	48	0.4	57	1.7	46	0.1	39	0.9	37	1.2	48	0.4	53	1.1	32	2.1	42	0.5
		R (Rice)	19	18	0.2	20	0.2	16	0.7	8	3.0	18	0.2	26	1.5	16	0.7	16	0.7	21	0.4	21	0.4	16	0.7
	NB Silk Road	L	11	12	0.3	8	1.0	8	1.0	8	1.0	17	1.6	10	0.3	14	0.8	9	0.6	16	1.4	14	0.8	13	0.6
		T (College)	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		T (Rice)	9	10	0.3	7	0.7	8	0.3	10	0.3	9	0.0	13	1.2	13	1.2	13	1.2	6	1.1	8	0.3	8	0.3
		R	10	10	0.0	7	1.0	6	1.4	17	1.9	8	0.7	12	0.6	6	1.4	10	0.0	12	0.6	17	1.9	7	1.0
	SB Rice Lane	L	21	22	0.2	22	0.2	28	1.4	15	1.4	23	0.4	22	0.2	20	0.2	17	0.9	30	1.8	25	0.8	20	0.2
		T	17	13	1.0	14	0.8	10	1.9	7	2.9	15	0.5	8	2.5	11	1.6	20	0.7	17	0.0	16	0.2	11	1.6
		R	6	6	0.0	7	0.4	3	1.4	6	0.0	8	0.6	7	0.4	6	0.0	6	0.0	7	0.4	7	0.4	5	0.4
	SB College Road	L	13	12	0.3	6	2.3	17	1.0	10	0.9	13	0.0	11	0.6	13	0.0	14	0.3	14	0.3	13	0.0	7	1.9
		T	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		R	4	4	0.0	4	0.0	2	1.2	4	0.0	3	0.5	7	1.3	8	1.6	7	1.3	2	1.2	1	1.9	3	0.5

	Aproach	Movement	Target Volume	Average Simulated	GEH	Run 1 Simulated	1 GEH	Run 2 Simulated	2 GEH	Run 3 Simulated	3 GEH	Run 4 Simulated	4 GEH	Run 5 Simulated	5 GEH	Run 6 Simulated	6 GEH	Run 7 Simulated	7 GEH	Run 8 Simulated	8 GEH	Run 9 Simulated	9 GEH	Run 10 Simulated	10 GEH
2040 PM	EB Route 67A	L (College)	4	4	0.0	6	0.8	0	2.8	4	0.0	2	1.2	4	0.0	7	1.2	3	0.5	4	0.0	10	2.1	2	1.2
		L (Rice)	9	8	0.3	5	1.5	10	0.3	13	1.2	5	1.5	7	0.7	5	1.5	13	1.2	12	0.9	6	1.1	8	0.3
		T	300	314	0.8	342	2.3	342	2.3	307	0.4	286	0.8	306	0.3	334	1.9	318	1.0	313	0.7	305	0.3	282	1.1
		R	24	26	0.4	28	0.8	31	1.3	20	0.9	27	0.6	32	1.5	25	0.2	26	0.4	22	0.4	27	0.6	19	1.1
	WB Route 67A	L	18	20	0.5	17	0.2	18	0.0	20	0.5	23	1.1	29	2.3	16	0.5	15	0.7	24	1.3	23	1.1	18	0.0
		T	369	379	0.5	392	1.2	388	1.0	400	1.6	354	0.8	367	0.1	386	0.9	427	2.9	395	1.3	340	1.5	341	1.5
		R (College)	29	30	0.2	38	1.6	19	2.0	32	0.5	21	1.6	20	1.8	34	0.9	43	2.3	30	0.2	24	1.0	38	1.6
		R (Rice)	72	74	0.2	71	0.1	70	0.2	69	0.4	88	1.8	83	1.2	85	1.5	70	0.2	76	0.5	73	0.1	56	2.0
	NB Silk Road	L	28	22	1.2	23	1.0	17	2.3	16	2.6	25	0.6	22	1.2	24	0.8	22	1.2	22	1.2	21	1.4	30	0.4
		T (College)	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		T (Rice)	21	22	0.2	27	1.2	25	0.8	23	0.4	22	0.2	19	0.4	18	0.7	23	0.4	19	0.4	26	1.0	15	1.4
		R	18	31	2.6	17	0.2	19	0.2	42	4.4	36	3.5	33	3.0	35	3.3	33	3.0	34	3.1	27	1.9	33	3.0
	SB Rice Lane	L	39	31	1.4	37	0.3	40	0.2	22	3.1	31	1.4	30	1.5	25	2.5	27	2.1	36	0.5	38	0.2	27	2.3
		T	15	16	0.3	17	0.5	15	0.0	13	0.5	18	0.7	11	1.1	17	0.5	18	0.7	22	1.6	16	0.3	12	0.8
		R	7	10	1.0	11	1.3	6	0.4	7	0.0	12	1.6	9	0.7	13	1.9	13	1.9	6	0.4	10	1.0	8	0.4
	SB College Road	L	72	74	0.2	84	1.4	78	0.7	81	1.0	83	1.2	69	0.4	75	0.3	71	0.1	64	1.0	62	1.2	73	0.1
		T	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		R	8	7	0.4	6	0.8	10	0.7	5	1.2	8	0.0	6	0.8	4	1.6	10	0.7	12	1.3	6	0.8	3	2.1

Average Queue Length - Route 67A - Alternative 3

Vehicle size 25 ft

	Location	Ave. Maximum Queue Length (ft)	Number of Vehicles	Run 1 Queue Length (ft)	1 Number of vehicles	Run 2 Queue Length (ft)	2 Number of vehicles	Run 3 Queue Length (ft)	3 Number of vehicles	Run 4 Queue Length (ft)	4 Number of vehicles	Run 5 Queue Length (ft)	5 Number of vehicles	Run 6 Queue Length (ft)	6 Number of vehicles	Run 7 Queue Length (ft)	7 Number of vehicles	Run 8 Queue Length (ft)	8 Number of vehicles	Run 9 Queue Length (ft)	9 Number of vehicles	Run 10 Queue Length (ft)	10 Number of vehicles
2040 AM	EB Route 67A	55	2	69	3	71	3	48	2	59	2	25	1	69	3	71	3	48	2	59	2	25	1
	WB Route 67A	75	3	123	5	47	2	83	3	49	2	64	3	123	5	47	2	83	3	49	2	64	3
	NB Silk Road	35	1	49	2	21	1	23	1	25	1	47	2	49	2	21	1	25	1	25	1	47	2
	SB Rice Lane	40	2	49	2	24	1	55	2	22	1	51	2	49	2	24	1	55	2	22	1	51	2
	SB College Road	25	1	20	1	26	1	22	1	21	1	26	1	20	1	26	1	22	1	21	1	26	1

	Location	Ave. Maximum Queue Length (ft)	Number of Vehicles	Run 1 Queue Length (ft)	1 Number of vehicles	Run 2 Queue Length (ft)	2 Number of vehicles	Run 3 Queue Length (ft)	3 Number of vehicles	Run 4 Queue Length (ft)	4 Number of vehicles	Run 5 Queue Length (ft)	5 Number of vehicles	Run 6 Queue Length (ft)	6 Number of vehicles	Run 7 Queue Length (ft)	7 Number of vehicles	Run 8 Queue Length (ft)	8 Number of vehicles	Run 9 Queue Length (ft)	9 Number of vehicles	Run 10 Queue Length (ft)	10 Number of vehicles
2040 PM	EB Route 67A	210	8	171	7	370	15	205	8	188	8	116	5	171	7	370	15	205	8	188	8	116	5
	WB Route 67A	310	12	331	13	222	9	417	17	376	15	211	8	331	13	222	9	417	17	376	15	211	8
	NB Silk Road	55	2	44	2	44	2	71	3	62	2	47	2	44	2	44	2	71	3	62	2	47	2
	SB Rice Lane	65	3	55	2	62	2	69	3	62	2	77	3	55	2	62	2	69	3	62	2	77	3
	SB College Road	70	3	65	3	50	2	68	3	71	3	92	4	65	3	50	2	68	3	71	3	92	4

Average Delay -Route 67A - Alternative 3

	Aproach	Movement	Average Delay (sec)	Run 1 Average Delay (sec)	Run 2 Average Delay (sec)	Run 3 Average Delay (sec)	Run 4 Average Delay (sec)	Run 5 Average Delay (sec)	Run 6 Average Delay (sec)	Run 7 Average Delay (sec)	Run 8 Average Delay (sec)	Run 9 Average Delay (sec)	Run 10 Average Delay (sec)
2040 AM	EB Route 67A	L (College)	3.6	2.8	3.3	4.8	6.2	1.3	0.9	2.7	7.7	3.1	3.5
		L (Rice)	2.2	1.9	0.2	3.2	1.7	2.8	3.4	2.9	1.8	1.1	3.2
		T	3.8	3.5	4.5	2.5	3.6	3.1	3.2	5.0	5.7	3.8	2.8
		R	5.0	5.2	2.7	2.6	2.7	5.7	7.9	4.7	12.4	3.8	2.6
	WB Route 67A	L	7.2	4.8	4.2	10.1	10.6	1.1	12.9	15.7	2.7	5.4	4.2
		T	4.5	5.4	3.5	4.9	5.0	5.2	3.4	5.1	4.9	3.8	3.9
		R (College)	4.5	6.4	4.1	3.3	5.3	4.3	3.1	7.4	2.6	4.5	3.6
		R (Rice)	6.8	7.4	3.5	22.5	3.0	5.5	5.3	6.9	3.7	3.1	6.8
	NB Silk Road	L	5.6	11.1	1.4	4.9	6.7	6.2	5.4	3.3	7.8	6.0	3.1
		T (College)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		T (Rice)	7.1	6.3	5.0	7.4	4.9	2.9	3.9	6.9	4.9	23.8	5.2
		R	6.4	6.0	6.2	3.3	3.3	3.3	14.0	5.0	8.6	8.4	5.7
	SB Rice Lane	L	5.5	5.3	5.0	11.3	6.6	9.0	4.4	3.4	2.5	4.0	3.1
		T	4.5	11.6	2.9	2.8	4.4	3.1	6.2	2.6	5.1	2.5	3.3
		R	6.1	9.0	14.1	7.3	4.4	6.8	5.3	3.9	4.6	3.1	2.3
	SB College Road	L	4.2	2.7	4.2	8.1	1.9	7.6	1.5	6.8	2.2	1.7	5.1
		T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		R	1.7	6.5	0.9	1.7	0.1	5.3	0.8	1.8	0.1	-0.5	0.1

	Aproach	Movement	Average Delay (sec)	Run 1 Average Delay (sec)	Run 2 Average Delay (sec)	Run 3 Average Delay (sec)	Run 4 Average Delay (sec)	Run 5 Average Delay (sec)	Run 6 Average Delay (sec)	Run 7 Average Delay (sec)	Run 8 Average Delay (sec)	Run 9 Average Delay (sec)	Run 10 Average Delay (sec)
2040 PM	EB Route 67A	L (College)	9.7	8.7	0.0	12.1	19.4	7.1	8.6	4.9	9.2	19.5	7.7
		L (Rice)	15.4	11.8	11.1	15.6	17.0	6.3	31.9	12.7	16.6	23.7	6.9
		T	12.1	15.9	14.9	11.7	10.6	10.1	14.2	11.1	12.4	10.0	10.3
		R	13.1	12.9	26.7	12.9	16.3	10.3	11.5	9.7	10.1	14.6	6.3
	WB Route 67A	L	16.1	13.3	13.2	17.3	24.7	16.4	11.6	15.8	18.9	15.7	14.3
		T	16.8	13.5	12.0	17.6	17.0	16.4	17.8	20.0	30.0	12.9	11.2
		R (College)	18.6	15.7	18.0	19.0	15.6	26.6	29.2	22.2	13.6	14.7	11.9
		R (Rice)	18.3	12.1	16.5	20.0	16.9	13.6	23.0	18.4	38.4	11.7	12.5
	NB Silk Road	L	11.4	9.6	10.0	10.3	8.5	4.1	11.9	8.3	40.4	4.5	6.5
		T (College)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		T (Rice)	8.9	8.9	5.9	6.4	6.2	9.9	13.7	15.8	9.7	6.7	5.4
		R	9.1	6.8	13.6	6.6	5.6	7.0	17.7	8.9	8.6	6.6	10.0
	SB Rice Lane	L	12.3	10.7	7.6	16.8	6.3	13.5	18.2	15.4	13.1	10.8	10.9
		T	17.4	20.9	20.9	11.7	13.8	15.8	21.6	24.2	13.2	22.9	9.2
		R	12.7	13.2	12.4	12.2	12.5	12.7	14.3	14.8	8.9	11.5	14.1
	SB College Road	L	12.5	14.6	9.8	11.2	16.1	11.2	10.1	19.6	12.0	11.1	9.8
		T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		R	11.7	9.1	9.8	3.7	3.6	8.0	36.6	19.9	12.9	6.1	7.8

Level of Service - Route 67 - Alternative 3

	Aproach	Movement	Target Volume (veh)	Simulated Volume (veh)	Movement Simulated Delay (s/veh)	Movement Level of Service	Max Simulated Queue Length (ft)	Approach Simulated Delay (s/veh)	Approach Level of Service	Intersection Simulated Delay (s/veh)	Intersection Level of Service
2040 AM Alternative 3	**EB Route 67A**	L (College)	*8*	7	3.6	A	55	3.8	A	4.4	A
		L (Rice)	*3*	3	2.2	A					
		T	*250*	263	3.8	A					
		R	*16*	18	5.0	A					
	WB Route 67A	L	*3*	4	7.2	A	75	4.7	A		
		T	*153*	162	4.5	A					
		R (College)	*45*	46	4.5	A					
		R (Rice)	*19*	18	6.8	A					
	NB Silk Road	L	*11*	12	5.6	A	35	6.3	A		
		T (College)	*0*	0	0.0	A					
		T (Rice)	*9*	10	7.1	A					
		R	*10*	10	6.4	A					
	SB Rice Lane	L	*21*	22	5.5	A	40	5.2	A		
		T	*17*	13	4.5	A					
		R	*6*	6	6.1	A					
	SB College Road	L	*13*	12	4.2	A	25	3.5	A		
		T	*0*	0	0.0	A					
		R	*4*	4	1.7	A					

	Aproach	Movement	Target Volume (veh)	Simulated Volume (veh)	Movement Simulated Delay (s/veh)	Movement Level of Service	Max Simulated Queue	Approach Simulated Delay (s/veh)	Approach Level of Service	Intersection Simulated Delay (s/veh)	Intersection Level of Service
2040 PM Alternative 3	**EB Route 67A**	L (College)	*4*	4	9.7	A	210	12.2	B	14.5	B
		L (Rice)	*9*	8	15.4	C					
		T	*300*	314	12.1	B					
		R	*24*	26	13.1	B					
	WB Route 67A	L	*18*	20	16.1	C	310	17.1	C		
		T	*369*	379	16.8	C					
		R (College)	*29*	30	18.6	C					
		R (Rice)	*72*	74	18.3	C					
	NB Silk Road	L	*28*	22	11.4	B	55	9.7	A		
		T (College)	*0*	0	0.0	A					
		T (Rice)	*21*	22	8.9	A					
		R	*18*	31	9.1	A					
	SB Rice Lane	L	*39*	31	12.3	B	65	13.8	B		
		T	*15*	16	17.4	C					
		R	*7*	10	12.7	B					
	SB College Road	L	*72*	74	12.5	B	70	12.5	B		
		T	*0*	0	0.0	A					
		R	*8*	7	11.7	B					

Volume Validation - Route 67A - Alternative 5

	Aproach	Movement	Target Volume	Average Simulated	GEH	Run 1 Simulated	Run 1 GEH	Run 2 Simulated	Run 2 GEH	Run 3 Simulated	Run 3 GEH	Run 4 Simulated	Run 4 GEH	Run 5 Simulated	Run 5 GEH	Run 6 Simulated	Run 6 GEH	Run 7 Simulated	Run 7 GEH	Run 8 Simulated	Run 8 GEH	Run 9 Simulated	Run 9 GEH	Run 10 Simulated	Run 10 GEH
2040 AM	EB Route 67A	L (College)	8	7	0.4	9	0.3	5	1.2	9	0.3	2	2.7	5	1.2	7	0.4	12	1.3	7	0.4	6	0.8	9	0.3
		L (Rice)	3	3	0.0	2	0.6	1	1.4	2	0.6	2	0.6	2	0.6	4	0.5	7	1.8	2	0.6	3	0.0	6	1.4
		T	250	262	0.8	277	1.7	293	2.6	253	0.2	237	0.8	263	0.8	277	1.7	258	0.5	270	1.2	263	0.8	230	1.3
		R	16	18	0.5	23	1.6	24	1.8	15	0.3	16	0.0	18	0.5	18	0.5	15	0.3	17	0.2	18	0.5	15	0.3
	WB Route 67A	L	3	4	0.5	3	0.0	2	0.6	2	0.6	4	0.5	1	1.4	5	1.0	5	1.0	6	1.4	6	1.4	4	0.5
		T	153	162	0.7	175	1.7	156	0.2	152	0.1	157	0.3	166	1.0	166	1.0	195	3.2	167	1.1	152	0.1	138	1.2
		R (College)	45	46	0.1	59	1.9	48	0.4	57	1.7	46	0.1	39	0.9	38	1.1	49	0.6	53	1.1	32	2.1	42	0.5
		R (Rice)	19	18	0.2	20	0.2	15	1.0	8	3.0	18	0.2	26	1.5	17	0.5	16	0.7	21	0.4	21	0.4	16	0.7
	NB Silk Road	L	11	10	0.3	7	1.3	6	1.7	17	1.6	8	1.0	12	0.3	6	1.7	10	0.3	12	0.3	17	1.6	7	1.3
		T (College)	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		T (Rice)	9	10	0.3	7	0.7	9	0.0	10	0.3	9	0.0	13	1.2	13	1.2	13	1.2	6	1.1	8	0.3	8	0.3
		R	10	12	0.6	8	0.7	7	1.0	8	0.7	17	1.9	10	0.0	14	1.2	9	0.3	16	1.7	14	1.2	13	0.9
	SB Rice Lane	L	21	22	0.2	22	0.2	28	1.4	15	1.4	22	0.2	22	0.2	20	0.2	17	0.9	30	1.8	25	0.8	20	0.2
		T	17	13	1.0	14	0.8	10	1.9	7	2.9	15	0.5	8	2.5	11	1.6	20	0.7	17	0.0	16	0.2	11	1.6
		R	6	6	0.0	7	0.4	3	1.4	6	0.0	8	0.8	7	0.4	6	0.0	6	0.0	7	0.4	7	0.4	5	0.4
	SB College Road	L	13	12	0.3	6	2.3	17	1.0	10	0.9	13	0.0	12	0.3	13	0.0	13	0.0	14	0.3	13	0.0	7	1.9
		T	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		R	4	4	0.0	4	0.0	2	1.2	4	0.0	3	0.5	7	1.3	8	1.6	7	1.3	2	1.2	1	1.9	3	0.5

	Aproach	Movement	Target Volume	Average Simulated	GEH	Run 1 Simulated	Run 1 GEH	Run 2 Simulated	Run 2 GEH	Run 3 Simulated	Run 3 GEH	Run 4 Simulated	Run 4 GEH	Run 5 Simulated	Run 5 GEH	Run 6 Simulated	Run 6 GEH	Run 7 Simulated	Run 7 GEH	Run 8 Simulated	Run 8 GEH	Run 9 Simulated	Run 9 GEH	Run 10 Simulated	Run 10 GEH
2040 PM	EB Route 67A	L (College)	4	4	0.0	6	0.9	0	2.8	4	0.0	2	1.2	4	0.0	7	1.3	3	0.5	4	0.0	10	2.3	2	1.2
		L (Rice)	9	8	0.3	5	1.5	10	0.3	13	1.2	5	1.5	7	0.7	5	1.5	13	1.2	12	0.9	6	1.1	8	0.3
		T	300	313	0.7	341	2.3	342	2.3	308	0.5	286	0.8	305	0.3	334	1.9	318	1.0	312	0.7	305	0.3	282	1.1
		R	24	26	0.4	29	1.0	31	1.3	20	0.9	26	0.4	32	1.5	25	0.2	26	0.4	22	0.4	27	0.6	19	1.1
	WB Route 67A	L	18	20	0.5	17	0.2	18	0.0	20	0.5	23	1.1	29	2.3	17	0.2	15	0.7	24	1.3	23	1.1	18	0.0
		T	369	378	0.5	389	1.0	386	0.9	403	1.7	354	0.8	367	0.1	385	0.8	429	3.0	395	1.3	340	1.5	336	1.8
		R (College)	29	30	0.2	38	1.6	19	2.0	32	0.5	21	1.6	20	1.8	34	0.9	43	2.3	30	0.2	23	1.2	38	1.6
		R (Rice)	72	74	0.2	71	0.1	70	0.2	69	0.4	88	1.8	84	1.4	84	1.4	70	0.2	76	0.5	73	0.1	56	2.0
	NB Silk Road	L	28	31	0.6	17	2.3	19	1.9	42	2.4	36	1.4	33	0.9	35	1.2	33	0.9	34	1.1	27	0.2	33	0.9
		T (College)	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		T (Rice)	21	22	0.2	27	1.2	25	0.8	22	0.2	22	0.2	19	0.4	18	0.7	23	0.4	19	0.4	26	1.0	15	1.4
		R	18	22	0.9	24	1.3	17	0.2	16	0.5	25	1.5	22	0.9	24	1.3	23	1.1	22	0.9	21	0.7	30	2.4
	SB Rice Lane	L	39	31	1.4	37	0.3	40	0.2	22	3.1	31	1.4	31	1.4	25	2.5	27	2.1	36	0.5	38	0.2	27	2.1
		T	15	16	0.3	17	0.5	15	0.0	13	0.5	18	0.7	10	1.4	17	0.5	18	0.7	22	1.6	16	0.3	12	0.8
		R	7	10	1.0	11	1.3	7	0.0	8	0.4	12	1.6	9	0.7	14	2.2	13	1.9	6	0.4	11	1.3	9	0.7
	SB College Road	L	72	74	0.2	85	1.5	78	0.7	81	1.0	83	1.2	69	0.4	75	0.3	71	0.1	64	1.0	62	1.2	75	0.3
		T	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		R	8	7	0.4	6	0.8	10	0.7	5	1.2	8	0.0	6	0.8	4	1.4	10	0.7	12	1.3	6	0.8	2	2.7

Average Queue Length - Route 67A - Alternative 5

Vehicle size 25 ft

	Location	Ave. Maximum Queue Length (ft)	Number of Vehicles	Run 1 Queue Length (ft)	Run 1 Number of vehicles	Run 2 Queue Length (ft)	Run 2 Number of vehicles	Run 3 Queue Length (ft)	Run 3 Number of vehicles	Run 4 Queue Length (ft)	Run 4 Number of vehicles	Run 5 Queue Length (ft)	Run 5 Number of vehicles	Run 6 Queue Length (ft)	Run 6 Number of vehicles	Run 7 Queue Length (ft)	Run 7 Number of vehicles	Run 8 Queue Length (ft)	Run 8 Number of vehicles	Run 9 Queue Length (ft)	Run 9 Number of vehicles	Run 10 Queue Length (ft)	Run 10 Number of vehicles
2040 AM	EB Route 67A	45	2	48	2	72	3	23	1	45	2	43	2	48	2	72	3	23	1	45	2	43	2
	WB Route 67A	80	3	166	7	55	2	49	2	65	3	71	3	166	7	55	2	49	2	65	3	71	3
	NB Silk Road	25	1	20	1	21	1	46	2	25	1	24	1	20	1	21	1	46	2	25	1	24	1
	NBR Silk Road	30	1	47	2	23	1	21	1	21	1	48	2	47	2	23	1	21	1	21	1	48	2
	SB Rice Lane	30	1	44	2	26	1	27	1	20	1	26	1	44	2	26	1	27	1	20	1	26	1
	SB College Road	20	1	23	1	19	1	22	1	21	1	19	1	23	1	19	1	22	1	21	1	19	1
	SBR College Road	20	1	21	1	0	0	19	1	23	1	29	1	21	1	0	0	19	1	23	1	29	1

	Location	Ave. Maximum Queue Length (ft)	Number of Vehicles	Run 1 Queue Length (ft)	Run 1 Number of vehicles	Run 2 Queue Length (ft)	Run 2 Number of vehicles	Run 3 Queue Length (ft)	Run 3 Number of vehicles	Run 4 Queue Length (ft)	Run 4 Number of vehicles	Run 5 Queue Length (ft)	Run 5 Number of vehicles	Run 6 Queue Length (ft)	Run 6 Number of vehicles	Run 7 Queue Length (ft)	Run 7 Number of vehicles	Run 8 Queue Length (ft)	Run 8 Number of vehicles	Run 9 Queue Length (ft)	Run 9 Number of vehicles	Run 10 Queue Length (ft)	Run 10 Number of vehicles
2040 PM	EB Route 67A	235	9	267	11	394	16	140	6	218	9	159	6	267	11	394	16	140	6	218	9	159	6
	WB Route 67A	405	16	564	23	330	13	402	16	457	18	278	11	564	23	330	13	402	16	457	18	278	11
	NB Silk Road	70	3	51	2	56	2	109	4	79	3	49	2	51	2	56	2	109	4	79	3	49	2
	NBR Silk Road	55	2	50	2	25	1	103	4	74	3	27	1	50	2	25	1	103	4	74	3	27	1
	SB Rice Lane	70	3	51	2	87	3	62	2	62	2	77	3	51	2	87	3	62	2	62	2	77	3
	SB College Road	65	3	94	4	49	2	53	2	92	4	47	2	94	4	49	2	53	2	92	4	47	2
	SBR College Road	90	4	126	5	81	3	85	3	82	3	79	3	126	5	81	3	85	3	82	3	79	3

Average Delay -Route 67A - Alternative 5

	Aproach	Movement	Average Delay (sec)	Run 1 Average Delay (sec)	Run 2 Average Delay (sec)	Run 3 Average Delay (sec)	Run 4 Average Delay (sec)	Run 5 Average Delay (sec)	Run 6 Average Delay (sec)	Run 7 Average Delay (sec)	Run 8 Average Delay (sec)	Run 9 Average Delay (sec)	Run 10 Average Delay (sec)
2040 AM	EB Route 67A	L (College)	3.1	5.0	-0.7	2.8	-0.1	1.3	0.7	4.1	2.5	7.4	7.7
		L (Rice)	1.8	4.0	-0.5	1.6	0.3	7.6	1.9	1.4	0.7	-0.1	1.3
		T	2.6	3.4	2.4	2.4	2.0	2.2	2.1	2.9	3.1	2.8	3.1
		R	2.8	2.4	2.2	1.3	3.0	1.9	5.3	3.4	3.9	2.4	2.1
	WB Route 67A	L	6.4	5.0	3.7	0.8	7.8	1.1	12.5	14.2	6.7	5.7	6.5
		T	5.2	5.5	4.4	5.0	3.7	5.3	4.8	7.2	5.4	4.8	5.3
		R (College)	4.9	6.6	5.2	2.3	7.2	4.6	4.0	6.1	3.7	3.9	5.0
		R (Rice)	8.7	10.0	6.1	12.0	7.3	5.4	12.7	15.5	3.9	6.9	7.1
	NB Silk Road	L	10.3	8.3	7.1	9.9	6.9	6.9	23.2	17.7	9.6	7.9	5.5
		T (College)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		T (Rice)	8.6	10.9	2.8	4.7	13.7	6.1	14.8	8.8	6.9	12.8	4.8
		R	5.8	6.8	8.0	5.8	5.0	5.4	3.3	5.8	3.8	10.2	4.2
	SB Rice Lane	L	4.3	3.5	2.1	7.5	1.4	5.1	4.0	5.7	3.9	5.0	5.3
		T	3.1	4.0	0.2	0.9	3.9	4.6	4.0	3.3	4.6	1.3	3.9
		R	6.2	2.7	37.0	4.8	0.3	2.6	5.1	2.0	2.0	2.1	3.6
	SB College Road	L	2.2	6.2	2.9	3.8	0.9	3.3	-0.4	2.3	1.1	-0.1	2.1
		T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		R	3.4	2.4	0.7	2.7	4.8	4.4	2.7	11.1	4.8	0.4	0.3

	Aproach	Movement	Average Delay (sec)	Run 1 Average Delay (sec)	Run 2 Average Delay (sec)	Run 3 Average Delay (sec)	Run 4 Average Delay (sec)	Run 5 Average Delay (sec)	Run 6 Average Delay (sec)	Run 7 Average Delay (sec)	Run 8 Average Delay (sec)	Run 9 Average Delay (sec)	Run 10 Average Delay (sec)
2040 PM	EB Route 67A	L (College)	8.4	7.5	0.0	19.2	8.9	2.7	13.9	9.5	7.4	9.4	9.1
		L (Rice)	14.6	38.8	6.7	8.3	16.0	2.3	15.7	12.9	21.1	15.2	8.9
		T	12.1	13.7	17.2	8.9	12.8	11.5	11.5	11.7	13.8	8.6	11.7
		R	16.0	15.1	23.4	10.0	11.4	12.1	14.7	28.1	19.4	11.3	14.8
	WB Route 67A	L	19.4	34.4	29.1	16.7	23.7	16.9	10.1	19.5	18.8	12.3	12.5
		T	18.4	23.8	19.7	20.4	20.3	16.1	21.5	21.1	16.4	12.6	12.4
		R (College)	24.7	37.9	37.7	18.2	15.9	19.5	25.7	44.4	12.7	14.8	20.0
		R (Rice)	20.0	26.4	28.0	18.2	16.3	19.2	23.3	23.6	13.7	10.3	20.5
	NB Silk Road	L	17.7	17.1	33.6	14.9	15.5	15.3	18.4	21.2	19.8	8.7	12.5
		T (College)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		T (Rice)	17.7	25.8	20.3	16.0	20.3	12.1	17.2	22.2	18.8	11.6	12.6
		R	9.7	12.5	12.7	10.1	11.0	5.9	6.8	13.0	9.5	7.7	7.5
	SB Rice Lane	L	12.7	7.3	11.4	13.0	8.8	18.0	14.1	16.9	14.8	12.3	9.9
		T	12.6	13.7	18.4	13.6	17.1	8.5	16.1	11.8	10.9	11.8	3.9
		R	13.4	7.5	6.1	19.6	14.2	16.6	19.2	21.6	6.6	9.3	12.8
	SB College Road	L	8.4	8.0	6.9	8.8	12.2	4.8	6.5	11.6	11.8	5.3	7.9
		T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		R	9.8	5.4	4.6	5.8	12.2	4.4	8.4	5.6	17.9	0.5	33.4

Level of Service - Route 67 - Alternative 5

	Aproach	Movement	Target Volume (veh)	Simulated Volume (veh)	Movement Simulated Delay (s/veh)	Movement Level of Service	Max Simulated Queue Length (ft)	Approach Simulated Delay (s/veh)	Approach Level of Service	Intersection Simulated Delay (s/veh)	Intersection Level of Service
2040 AM Alternative 5	**EB Route 67A**	L (College)	*8*	7	3.1	A	45	2.6	A	4.1	A
		L (Rice)	*3*	3	1.8	A					
		T	*250*	262	2.6	A					
		R	*16*	18	2.8	A					
	WB Route 67A	L	*3*	4	6.4	A	80	5.4	A		
		T	*153*	162	5.2	A					
		R (College)	*45*	46	4.9	A					
		R (Rice)	*19*	18	8.7	A					
	NB Silk Road	L	*11*	10	10.3	B	30	8.1	A		
		T (College)	*0*	0	0.0	A					
		T (Rice)	*9*	10	8.6	A					
		R	*10*	12	5.8	A					
	SB Rice Lane	L	*21*	22	4.3	A	30	4.2	A		
		T	*17*	13	3.1	A					
		R	*6*	6	6.2	A					
	SB College Road	L	*13*	12	2.2	A	25	2.5	A		
		T	*0*	0	0.0	A					
		R	*4*	4	3.4	A					

	Aproach	Movement	Target Volume (veh)	Simulated Volume (veh)	Movement Simulated Delay (s/veh)	Movement Level of Service	Max Simulated Queue	Approach Simulated Delay (s/veh)	Approach Level of Service	Intersection Simulated Delay (s/veh)	Intersection Level of Service
2040 PM Alternative 5	**EB Route 67A**	L (College)	*4*	4	8.4	A	235	12.4	B	15.5	C
		L (Rice)	*9*	8	14.6	B					
		T	*300*	313	12.1	B					
		R	*24*	26	16.0	C					
	WB Route 67A	L	*18*	20	19.4	C	405	19.1	C		
		T	*369*	378	18.4	C					
		R (College)	*29*	30	24.7	C					
		R (Rice)	*72*	74	20.0	C					
	NB Silk Road	L	*28*	31	17.7	C	70	15.3	C		
		T (College)	*0*	0	0.0	A					
		T (Rice)	*21*	22	17.7	C					
		R	*18*	22	9.7	A					
	SB Rice Lane	L	*39*	31	12.7	B	70	12.8	B		
		T	*15*	16	12.6	B					
		R	*7*	10	13.4	B					
	SB College Road	L	*72*	74	8.4	A	90	8.5	A		
		T	*0*	0	0.0	A					
		R	*8*	7	9.8	A					

Volume Validation - Route 67A - Alternative 6

	Aproach	Movement	Target Volume	Average Simulated	GEH	Run 1 Simulated	Run 1 GEH	Run 2 Simulated	Run 2 GEH	Run 3 Simulated	Run 3 GEH	Run 4 Simulated	Run 4 GEH	Run 5 Simulated	Run 5 GEH	Run 6 Simulated	Run 6 GEH	Run 7 Simulated	Run 7 GEH	Run 8 Simulated	Run 8 GEH	Run 9 Simulated	Run 9 GEH	Run 10 Simulated	Run 10 GEH
2040 AM	EB Route 67A	L (College)	8	7	0.4	9	0.3	5	1.2	8	0.0	2	2.7	5	1.2	7	0.4	12	1.3	7	0.4	6	0.8	9	0.3
		L (Rice)	3	3	0.0	2	0.6	1	1.4	2	0.6	2	0.6	2	0.6	4	0.5	7	1.8	2	0.6	3	0.0	5	1.0
		T	250	262	0.8	278	1.7	292	2.6	254	0.3	237	0.8	263	0.8	277	1.7	258	0.5	270	1.2	264	0.9	230	1.3
		R	16	18	0.5	23	1.6	24	1.8	15	0.3	16	0.0	18	0.5	18	0.5	15	0.3	17	0.2	18	0.5	15	0.3
	WB Route 67A	L	3	4	0.5	3	0.0	2	0.6	2	0.6	4	0.5	1	1.4	5	1.0	5	1.0	6	1.4	6	1.4	4	0.5
		T	153	163	0.8	175	1.7	156	0.2	153	0.0	157	0.3	166	1.0	166	1.0	194	3.1	167	1.1	153	0.0	138	1.2
		R (College)	45	46	0.1	59	1.9	48	0.4	57	1.7	45	0.0	39	0.9	37	1.2	49	0.6	53	1.1	32	2.1	42	0.5
		R (Rice)	19	18	0.2	20	0.2	15	1.0	8	3.0	18	0.2	26	1.5	16	0.7	16	0.7	21	0.4	20	0.4	16	0.7
	NB Silk Road	L	11	10	0.3	7	1.3	6	1.7	17	1.6	8	1.0	12	0.3	6	1.7	10	0.3	12	0.3	17	1.6	7	1.3
		T (College)	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		T (Rice)	9	10	0.3	7	0.7	9	0.0	10	0.3	9	0.0	13	1.2	13	1.2	13	1.2	6	1.1	8	0.3	8	0.3
		R	10	12	0.6	8	0.7	8	0.7	8	0.7	17	1.9	10	0.0	14	1.2	9	0.3	16	1.7	14	1.2	13	0.9
	SB Rice Lane	L	21	22	0.2	22	0.2	28	1.4	15	1.4	23	0.4	22	0.2	20	0.2	17	0.9	30	1.8	25	0.8	20	0.2
		T	17	13	1.0	14	0.8	10	1.9	7	2.9	15	0.5	8	2.5	11	1.6	20	0.7	17	0.0	16	0.2	11	1.6
		R	6	6	0.0	7	0.4	3	1.4	6	0.0	8	0.8	7	0.4	6	0.0	6	0.0	7	0.4	7	0.4	5	0.4
	SB College Road	L	13	12	0.3	6	2.3	17	1.0	10	0.9	13	0.0	11	0.6	13	0.0	13	0.0	14	0.3	13	0.0	7	1.9
		T	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		R	4	4	0.0	4	0.0	2	1.2	4	0.0	3	0.5	8	1.6	8	1.6	7	1.3	2	1.2	1	1.9	3	0.5

	Aproach	Movement	Target Volume	Average Simulated	GEH	Run 1 Simulated	Run 1 GEH	Run 2 Simulated	Run 2 GEH	Run 3 Simulated	Run 3 GEH	Run 4 Simulated	Run 4 GEH	Run 5 Simulated	Run 5 GEH	Run 6 Simulated	Run 6 GEH	Run 7 Simulated	Run 7 GEH	Run 8 Simulated	Run 8 GEH	Run 9 Simulated	Run 9 GEH	Run 10 Simulated	Run 10 GEH
2040 PM	EB Route 67A	L (College)	4	4	0.0	6	0.9	0	2.8	4	0.0	2	1.2	4	0.0	7	1.3	3	0.5	4	0.0	10	2.3	2	1.2
		L (Rice)	9	8	0.3	5	1.5	10	0.3	13	1.2	5	1.5	7	0.7	5	1.5	13	1.2	12	0.9	6	1.1	8	0.3
		T	300	314	0.8	342	2.3	342	2.3	307	0.4	287	0.8	306	0.3	334	1.9	318	1.0	313	0.7	304	0.2	282	1.1
		R	24	26	0.4	29	1.0	31	1.3	20	0.9	26	0.4	32	1.5	25	0.2	26	0.4	22	0.4	27	0.6	19	1.1
	WB Route 67A	L	18	20	0.5	17	0.2	18	0.0	20	0.5	23	1.1	29	2.3	17	0.2	15	0.7	24	1.3	23	1.1	18	0.0
		T	369	380	0.6	391	1.1	388	1.0	405	1.8	354	0.8	366	0.2	388	1.0	429	3.0	396	1.4	340	1.5	346	1.2
		R (College)	29	30	0.2	39	1.7	19	2.0	32	0.5	21	1.6	20	1.8	34	0.9	43	2.3	30	0.2	24	1.0	38	1.6
		R (Rice)	72	74	0.2	70	0.2	70	0.2	70	0.2	88	1.8	85	1.5	85	1.5	70	0.2	76	0.5	73	0.1	56	2.0
	NB Silk Road	L	28	31	0.6	17	2.3	19	1.9	42	2.4	36	1.4	33	0.9	35	1.2	33	0.9	34	1.1	27	0.2	33	0.9
		T (College)	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		T (Rice)	21	22	0.2	27	1.2	25	0.8	23	0.4	22	0.2	19	0.4	18	0.7	23	0.4	19	0.4	26	1.0	15	1.4
		R	18	22	0.9	23	1.1	17	0.2	16	0.5	25	1.5	22	0.9	24	1.3	23	1.1	22	0.9	21	0.7	30	2.4
	SB Rice Lane	L	39	31	1.4	37	0.3	40	0.2	21	3.3	31	1.4	31	1.4	25	2.5	28	1.9	36	0.5	38	0.2	27	2.1
		T	15	16	0.3	17	0.5	16	0.3	14	0.3	18	0.7	11	1.1	18	0.7	17	0.5	22	1.6	16	0.3	13	0.5
		R	7	10	1.0	11	1.3	6	0.4	7	0.0	12	1.6	9	0.7	13	1.9	13	1.9	6	0.4	11	1.3	8	0.4
	SB College Road	L	72	74	0.2	84	1.4	78	0.7	81	1.0	82	1.1	67	0.6	76	0.5	71	0.1	64	1.0	62	1.2	74	0.2
		T	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		R	8	7	0.4	6	0.8	10	0.7	5	1.2	8	0.0	6	0.8	4	1.6	10	0.7	12	1.3	6	0.8	2	2.7

Average Queue Length - Route 67A - Alternative 6

Vehicle size 25 ft

	Location	Ave. Maximum Queue Length (ft)	Number of Vehicles	Run 1 Queue Length (ft)	Run 1 Number of vehicles	Run 2 Queue Length (ft)	Run 2 Number of vehicles	Run 3 Queue Length (ft)	Run 3 Number of vehicles	Run 4 Queue Length (ft)	Run 4 Number of vehicles	Run 5 Queue Length (ft)	Run 5 Number of vehicles	Run 6 Queue Length (ft)	Run 6 Number of vehicles	Run 7 Queue Length (ft)	Run 7 Number of vehicles	Run 8 Queue Length (ft)	Run 8 Number of vehicles	Run 9 Queue Length (ft)	Run 9 Number of vehicles	Run 10 Queue Length (ft)	Run 10 Number of vehicles
2040 AM	EB Route 67A	50	2	44	2	60	2	22	1	24	1	104	4	44	2	60	2	22	1	24	1	104	4
	WB Route 67A	70	3	106	4	46	2	57	2	55	2	76	3	106	4	46	2	57	2	55	2	76	3
	NB Silk Road	20	1	45	2	21	1	17	1	24	1	0	0	45	2	21	1	17	1	24	1	0	0
	NBR Silk Road	10	0	47	2	0	0	0	0	0	0	0	0	47	2	0	0	0	0	0	0	0	0
	SB Rice Lane	25	1	26	1	23	1	21	1	20	1	26	1	26	1	23	1	21	1	20	1	26	1
	SB College Road	25	1	22	1	23	1	22	1	20	1	27	1	22	1	23	1	22	1	20	1	27	1

	Location	Ave. Maximum Queue Length (ft)	Number of Vehicles	Run 1 Queue Length (ft)	Run 1 Number of vehicles	Run 2 Queue Length (ft)	Run 2 Number of vehicles	Run 3 Queue Length (ft)	Run 3 Number of vehicles	Run 4 Queue Length (ft)	Run 4 Number of vehicles	Run 5 Queue Length (ft)	Run 5 Number of vehicles	Run 6 Queue Length (ft)	Run 6 Number of vehicles	Run 7 Queue Length (ft)	Run 7 Number of vehicles	Run 8 Queue Length (ft)	Run 8 Number of vehicles	Run 9 Queue Length (ft)	Run 9 Number of vehicles	Run 10 Queue Length (ft)	Run 10 Number of vehicles
2040 PM	EB Route 67A	160	6	205	8	274	11	116	5	81	3	126	5	205	8	274	11	116	5	81	3	126	5
	WB Route 67A	265	11	152	6	263	11	468	19	251	10	198	8	152	6	263	11	468	19	251	10	198	8
	NB Silk Road	45	2	39	2	37	1	51	2	65	3	31	1	39	2	37	1	51	2	65	3	31	1
	NBR Silk Road	40	2	40	2	38	2	52	2	72	3	0	0	40	2	38	2	52	2	72	3	0	0
	SB Rice Lane	55	2	63	3	26	1	60	2	61	2	75	3	63	3	26	1	60	2	61	2	75	3
	SB College Road	65	3	88	4	52	2	60	2	68	3	51	2	88	4	52	2	60	2	68	3	51	2

Average Delay -Route 67A - Alternative 6

	Aproach	Movement	Average Delay (sec)	Run 1 Average Delay (sec)	Run 2 Average Delay (sec)	Run 3 Average Delay (sec)	Run 4 Average Delay (sec)	Run 5 Average Delay (sec)	Run 6 Average Delay (sec)	Run 7 Average Delay (sec)	Run 8 Average Delay (sec)	Run 9 Average Delay (sec)	Run 10 Average Delay (sec)
2040 AM	EB Route 67A	L (College)	1.9	0.7	1.2	0.7	4.8	0.3	-0.9	4.2	4.8	1.8	1.9
		L (Rice)	0.5	4.7	-2.3	0.8	-0.2	1.8	2.0	1.4	-1.4	0.1	
		T	1.9	2.5	2.1	1.7	1.7	2.2	1.8	1.5	2.5	1.5	1.2
		R	2.6	2.4	3.0	0.8	3.7	3.3	0.8	3.9	3.5	2.3	1.9
	WB Route 67A	L	5.2	1.9	2.2	1.8	8.4	-0.2	5.7	19.4	2.6	7.4	3.1
		T	2.8	3.3	2.3	3.2	2.1	4.6	1.9	3.9	3.0	1.7	2.1
		R (College)	2.8	4.5	2.3	1.4	2.3	3.5	2.5	3.9	1.5	4.2	2.4
		R (Rice)	6.0	6.5	3.0	16.3	10.5	5.1	3.5	7.6	1.8	3.2	2.8
	NB Silk Road	L	6.1	3.1	4.7	3.3	5.8	18.4	3.4	3.3	11.4	5.0	2.4
		T (College)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		T (Rice)	5.6	8.2	5.4	3.6	7.4	2.5	9.6	5.8	3.5	7.1	3.1
		R	4.0	5.8	1.7	5.3	5.2	3.4	2.4	3.6	5.0	4.8	2.8
	SB Rice Lane	L	3.7	2.2	6.2	3.4	3.5	4.7	2.2	6.8	3.2	2.3	2.7
		T	3.2	3.9	1.0	3.5	1.4	6.8	1.6	7.3	2.0	2.4	1.7
		R	2.1	0.6	3.2	2.7	1.8	1.7	5.0	0.1	2.2	2.4	1.1
	SB College Road	L	2.8	2.9	0.8	2.1	1.2	4.1	0.6	10.0	1.6	1.9	2.5
		T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		R	1.2	1.3	0.2	3.6	0.3	0.6	2.7	3.0	0.3	0.0	0.2

	Aproach	Movement	Average Delay (sec)	Run 1 Average Delay (sec)	Run 2 Average Delay (sec)	Run 3 Average Delay (sec)	Run 4 Average Delay (sec)	Run 5 Average Delay (sec)	Run 6 Average Delay (sec)	Run 7 Average Delay (sec)	Run 8 Average Delay (sec)	Run 9 Average Delay (sec)	Run 10 Average Delay (sec)
2040 PM	EB Route 67A	L (College)	4.6	3.1	0.0	2.3	5.0	7.8	4.8	6.0	6.2	7.9	3.0
		L (Rice)	7.4	6.4	7.0	3.9	13.8	3.3	9.3	7.6	8.2	9.3	5.5
		T	5.7	6.7	7.2	5.1	4.8	4.8	5.0	4.8	7.0	4.8	6.5
		R	7.8	7.8	11.5	3.6	9.1	5.6	8.0	5.0	15.0	9.5	3.1
	WB Route 67A	L	11.7	12.7	13.4	9.8	20.0	10.9	8.5	11.4	13.0	6.7	10.6
		T	11.0	9.4	11.9	12.0	10.4	9.3	10.6	16.6	14.0	8.2	7.8
		R (College)	13.6	14.4	21.5	10.4	11.8	10.0	17.2	18.0	11.2	12.5	8.8
		R (Rice)	12.0	9.6	18.2	9.9	9.8	9.1	13.0	18.1	15.0	8.2	9.5
	NB Silk Road	L	9.8	4.8	14.9	6.8	11.1	6.9	13.8	11.1	8.5	6.7	13.2
		T (College)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		T (Rice)	10.7	9.5	12.1	8.1	4.9	9.4	14.1	15.2	8.8	10.5	14.6
		R	9.1	11.9	5.1	7.5	12.0	10.3	8.9	9.4	14.4	5.1	6.0
	SB Rice Lane	L	7.7	6.6	8.7	10.9	5.8	5.7	7.5	9.0	11.5	5.3	10.6
		T	10.5	14.2	8.4	17.7	4.3	6.7	9.9	11.4	10.7	11.5	10.3
		R	10.2	8.4	0.4	10.2	6.3	5.6	14.6	30.7	3.8	7.3	14.7
	SB College Road	L	9.3	13.8	5.8	7.0	10.3	4.9	7.6	17.1	9.8	6.4	10.6
		T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		R	11.2	19.9	6.8	7.8	7.4	1.9	11.4	15.0	16.6	0.9	24.5

Level of Service - Route 67A - Alternative 6

	Aproach	Movement	Target Volume (veh)	Simulated Volume (veh)	Movement Simulated Delay (s/veh)	Movement Level of Service	Max Simulated Queue Length (ft)	Approach Simulated Delay (s/veh)	Approach Level of Service	Intersection Simulated Delay (s/veh)	Intersection Level of Service
2040 AM Alternative 6	**EB Route 67A**	L (College)	*8*	7	1.9	A	50	1.9	A	2.6	A
		L (Rice)	*3*	3	0.5	A					
		T	*250*	262	1.9	A					
		R	*16*	18	2.6	A					
	WB Route 67A	L	*3*	4	5.2	A	70	3.1	A		
		T	*153*	163	2.8	A					
		R (College)	*45*	46	2.8	A					
		R (Rice)	*19*	18	6.0	A					
	NB Silk Road	L	*11*	10	6.1	A	25	5.2	A		
		T (College)	*0*	0	0.0	A					
		T (Rice)	*9*	10	5.6	A					
		R	*10*	12	4.0	A					
	SB Rice Lane	L	*21*	22	3.7	A	25	3.3	A		
		T	*17*	13	3.2	A					
		R	*6*	6	2.1	A					
	SB College Road	L	*13*	12	2.8	A	25	2.4	A		
		T	*0*	0	0.0	A					
		R	*4*	4	1.2	A					

	Aproach	Movement	Target Volume (veh)	Simulated Volume (veh)	Movement Simulated Delay (s/veh)	Movement Level of Service	Max Simulated Queue	Approach Simulated Delay (s/veh)	Approach Level of Service	Intersection Simulated Delay (s/veh)	Intersection Level of Service
2040 PM Alternative 6	**EB Route 67A**	L (College)	*4*	4	4.6	A	160	5.9	A	9.2	A
		L (Rice)	*9*	8	7.4	A					
		T	*300*	314	5.7	A					
		R	*24*	26	7.8	A					
	WB Route 67A	L	*18*	20	11.7	B	265	11.4	B		
		T	*369*	380	11.0	B					
		R (College)	*29*	30	13.6	B					
		R (Rice)	*72*	74	12.0	B					
	NB Silk Road	L	*28*	31	9.8	A	45	9.8	A		
		T (College)	*0*	0	0.0	A					
		T (Rice)	*21*	22	10.7	B					
		R	*18*	22	9.1	A					
	SB Rice Lane	L	*39*	31	7.7	A	55	8.9	A		
		T	*15*	16	10.5	B					
		R	*7*	10	10.2	B					
	SB College Road	L	*72*	74	9.3	A	65	9.5	A		
		T	*0*	0	0.0	A					
		R	*8*	7	11.2	B					

APPENDIX

H SYNCHRO & SIMTRAFFIC RESULTS

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	258	164	44	13	4
Future Vol, veh/h	8	258	164	44	13	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	33	88	87	65	50	54
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	24	293	189	68	26	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	257	0	-	0	564	223
Stage 1	-	-	-	-	223	-
Stage 2	-	-	-	-	341	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1320	-	-	-	490	822
Stage 1	-	-	-	-	819	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1320	-	-	-	479	822
Mov Cap-2 Maneuver	-	-	-	-	479	-
Stage 1	-	-	-	-	801	-
Stage 2	-	-	-	-	725	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1320	-	-	-	528
HCM Lane V/C Ratio	0.018	-	-	-	0.063
HCM Control Delay (s)	7.8	0	-	-	12.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Traffic Vol, veh/h	3	252	16	3	191	19	17	6	11	9
Future Vol, veh/h	3	252	16	3	191	19	17	6	11	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None	-	-
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	25	90	67	75	85	53	53	50	55	45
Heavy Vehicles, %	0	2	0	0	1	21	0	0	0	0
Mvmt Flow	12	280	24	4	225	36	32	12	20	20

Major/Minor	Major1			Major2			Minor2		Minor1	
Conflicting Flow All	261	0	0	304	0	0	585	243	589	292
Stage 1	-	-	-	-	-	-	251	-	316	-
Stage 2	-	-	-	-	-	-	334	-	273	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.2	7.1	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	-	6.1	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	-	6.1	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	3.3	3.5	3.3
Pot Cap-1 Maneuver	1315	-	-	1268	-	-	425	801	423	752
Stage 1	-	-	-	-	-	-	758	-	699	-
Stage 2	-	-	-	-	-	-	684	-	737	-
Platoon blocked, %		-	-		-	-				
Mov Cap-1 Maneuver	1315	-	-	1268	-	-	397	801	388	752
Mov Cap-2 Maneuver	-	-	-	-	-	-	397	-	388	-
Stage 1	-	-	-	-	-	-	750	-	691	-
Stage 2	-	-	-	-	-	-	642	-	690	-

Approach	EB	WB	SB	NW
HCM Control Delay, s	0.3	0.1	14.4	12.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	494	1315	-	-	1268	-	-	450
HCM Lane V/C Ratio	0.073	0.009	-	-	0.003	-	-	0.151
HCM Control Delay (s)	12.9	7.8	0	-	7.8	0	-	14.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	321	388	29	68	8
Future Vol, veh/h	4	321	388	29	68	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	91	95	66	74	50
Heavy Vehicles, %	0	5	2	0	0	0
Mvmt Flow	8	353	408	44	92	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	452	0	-	0	799	430
Stage 1	-	-	-	-	430	-
Stage 2	-	-	-	-	369	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1119	-	-	-	357	629
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1119	-	-	-	354	629
Mov Cap-2 Maneuver	-	-	-	-	354	-
Stage 1	-	-	-	-	654	-
Stage 2	-	-	-	-	704	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1119	-	-	-	379
HCM Lane V/C Ratio	0.007	-	-	-	0.285
HCM Control Delay (s)	8.2	0	-	-	18.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1.2

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations		↕			↕		⋔		⋔	
Traffic Vol, veh/h	9	356	24	18	382	68	15	7	28	21
Future Vol, veh/h	9	356	24	18	382	68	15	7	28	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	None	-	-
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	56	96	67	64	96	81	63	58	70	75
Heavy Vehicles, %	0	5	0	0	1	0	6	8	3	4
Mvmt Flow	16	371	36	28	398	84	24	12	40	28

Major/Minor	Major1			Major2			Minor2		Minor1	
Conflicting Flow All	482	0	0	407	0	0	943	440	935	389
Stage 1	-	-	-	-	-	-	496	-	421	-
Stage 2	-	-	-	-	-	-	447	-	514	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.13	6.28	7.13	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	-	6.13	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	-	6.13	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.527	3.372	3.527	3.3
Pot Cap-1 Maneuver	1091	-	-	1163	-	-	242	605	245	664
Stage 1	-	-	-	-	-	-	554	-	608	-
Stage 2	-	-	-	-	-	-	589	-	541	-
Platoon blocked, %		-	-		-	-				
Mov Cap-1 Maneuver	1091	-	-	1163	-	-	204	605	214	664
Mov Cap-2 Maneuver	-	-	-	-	-	-	204	-	214	-
Stage 1	-	-	-	-	-	-	543	-	596	-
Stage 2	-	-	-	-	-	-	530	-	489	-

Approach	EB	WB	SB	NW
HCM Control Delay, s	0.3	0.5	32.7	21.1
HCM LOS			D	C

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	287	1091	-	-	1163	-	-	231
HCM Lane V/C Ratio	0.223	0.015	-	-	0.024	-	-	0.449
HCM Control Delay (s)	21.1	8.3	0	-	8.2	0	-	32.7
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.8	0	-	-	0.1	-	-	2.2

Intersection: 1: Route 67A & College Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	50	61
Average Queue (ft)	6	22
95th Queue (ft)	28	52
Link Distance (ft)	1030	608
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Silk Road & Route 67A & Rice Lane

Movement	EB	WB	SB	NW
Directions Served	LTR	LTR	<LR	LR>
Maximum Queue (ft)	46	9	53	47
Average Queue (ft)	5	0	27	20
95th Queue (ft)	26	5	47	39
Link Distance (ft)	72	883	607	688
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Route 67A & College Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	46	3	92
Average Queue (ft)	4	0	45
95th Queue (ft)	24	3	77
Link Distance (ft)	1030	72	608
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Silk Road & Route 67A & Rice Lane

Movement	EB	WB	SB	NW
Directions Served	LTR	LTR	<LR	LR>
Maximum Queue (ft)	76	75	132	81
Average Queue (ft)	11	9	45	33
95th Queue (ft)	46	40	93	64
Link Distance (ft)	72	883	607	688
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	1			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1